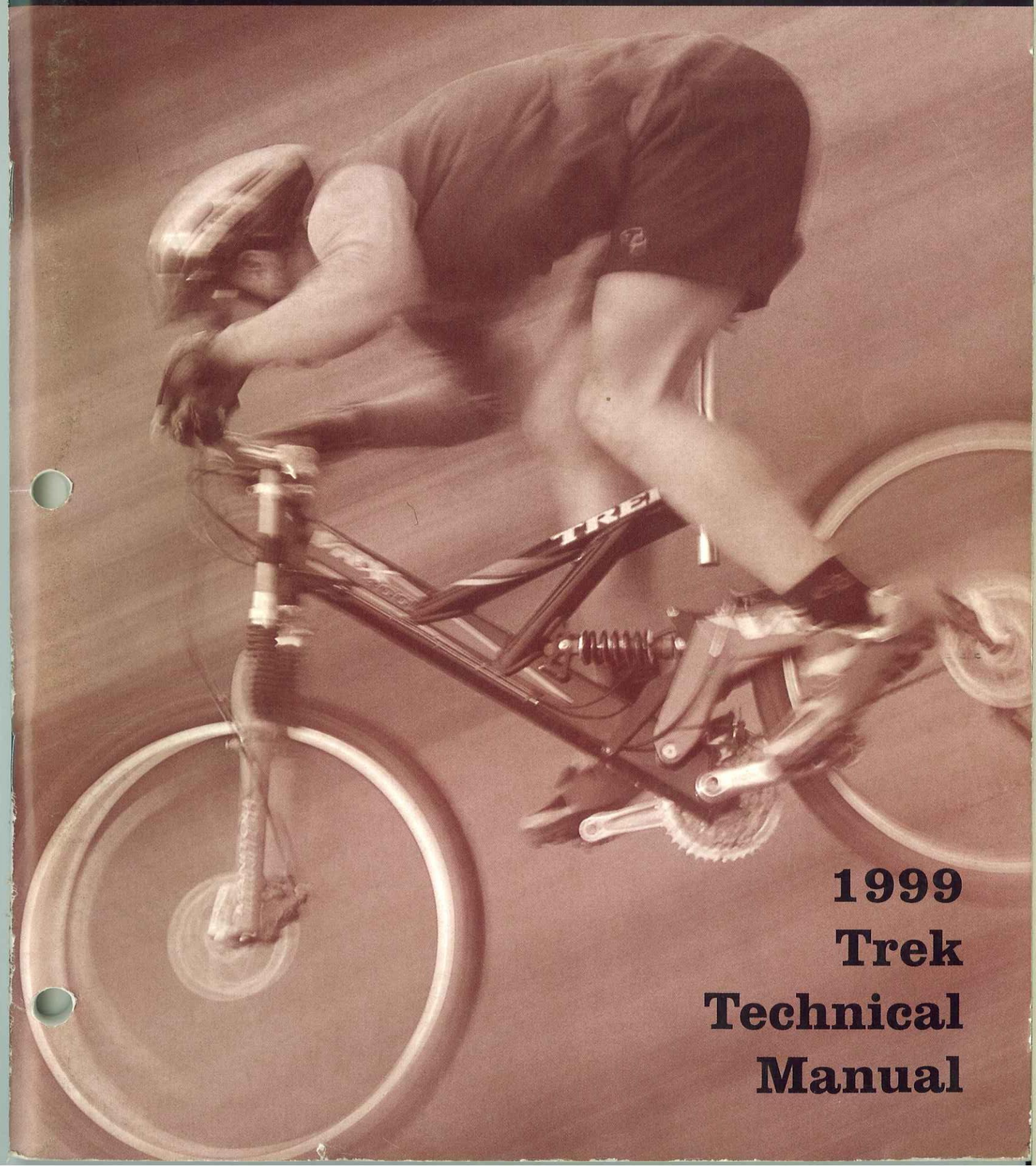
TREK®

AMERICAN BICYCLE TECHNOLOGY™



1999 Trek Technical Manual

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5 Steps To Help Your Customer Find The Right Bike

Step 1- Help your customer decide how they want to ride

The only way to educate the customer about how much bike they need is to have them ask, and help them answer, where, how much and how hard they plan to ride.

Ride Factors in determining Types of Riding

Surface Types

Pavement

Dirt

- Local- unpaved bike paths, dirt roads without irregular transitions (bumps)
- Off road- dirt roads with transitions of up to 2-3"
- Singletrack- narrow dirt paths with transitions of up to 4"
- Extreme- Very rough, sudden transitions greater than 6"

Topography

- Flat- less than 50' elevation change
- Rolling- continuous elevation changes of up to 100'
- Hilly- - continuous elevation changes of up to 500'
- Mountainous- elevation change more than 500'

Distance

- Local- bike paths, neighborhood streets, dirt rides of less than one hour
- Extended local- any city roads, county lanes, dirt rides of less than 2 hours
- Race/Tour- local highways, dirt rides of less than 4 hours
- Long distance - across state lines, or dirt rides of more than 4 hours

Intensity

- Casual- Don't like to breathe too hard
- Sporty- Like to zip along as long as it doesn't hurt, breathe hard occasionally
- Training- Breathing very hard sometimes, enjoy feeling muscle pain
- Racing- Ride competitively, although not necessarily in organized events
- Pro- You know your racing license number by heart

We assume that many times consumers buy less bike than they need. By using this guide with the above descriptions of what a bike is for, the consumer can make sure they get a bike which allows them to ride the way they want today, and also plan for their riding tomorrow.

How Much Does The Customer Need To Spend?

In Step 1, focus on giving the customer information that helps them anticipate how much they need to spend to get a bike that will meet their cycling expectations. DO NOT ask the customer "How much do you want to spend?".

Tell consumers there are three general price and performance categories. The price ranges of these categories varies according to bike type due to cost of frame platforms, wheels, suspension, and componentry.

"Recreational" level

These bikes may have the same design as their higher-priced cousins, but don't use exotic frame materials or trick components. Suitable for Extended Local rides of Sporty intensity. $250-$900.

"Competitive" level

These bikes typically combine light, strong steel-alloy or aluminum frames with midrange wheels and components. Suitable for Race/Tour riding of Racing intensity. If you want great performance, these bikes offer the most 'bang for the buck'. $500-$1800.

"Professional" level

The top-of-the-line bikes feature the framesets, wheels and components professional and serious amateur competitors use. No corners are cut to save cost, and the precision manufacturing means that parts will stand up to Long Distance riding of Racing and Pro intensity. If you want the latest and greatest- whether because you're a competitor or connoisseur of fine equipment- this is the class . $1000 and up.

Step 2- Choose the right frame

The next step in finding the right bike is to compare frames. Since 70% of a bike's riding characteristics come from the frame, and everything else on the bike is replaceable and can be upgraded, it's worth finding out what frame geometry, material and size is best for the type of riding the customer identified in Step 1.

Frame performance and geometry is complex and difficult to explain. The key points to get across to consumers are:

- A bike's frame design has a big effect on it's riding characteristics. When we say 'frame design' we're referring to all frame dimensions which contribute to the way a bike rides; geometry, tubing diameters, wall thickness, tube lengths, etc..
- What riding characteristics is the frame designed for, and how will it make cycling more enjoyable for the consumer?
- What defines comfort on a bike of that type of riding and with that geometry?

Differentiating Ride Characteristics of Frames

- Efficiency:

How well the frame transmits the riders power to the rear wheel. Since the rider is the motor that provides the power, the riders position is also important to provide achieve efficiency and maximum output.

- Comfort:

The ability of the frameset to properly position the rider to dissipate bump shock. Remember, to some riders a racing bike puts them in an uncomfortable position, and for other riders a wide saddle and upright position is equally uncomfortable. Find out what each customer needs.

- Handling:

How a bike responds to input from the rider, such as steering. These inputs can also be unintentional, such as weight distribution over the wheels. Handling also refers to how the bike responds to input from the terrain, like bumps or uneven surfaces.

- Weight:

The bike weight and frameset weight as a result of design selections. Weight effects acceleration and the rider's ability to lift and maneuver the bicycle over and around obstacles. The importance of bike weight comes from efficiency; it takes more work to move more weight.

How the weight is accounted for also needs to be considered. By reducing the rotational mass at the outside of the wheel Kevlar beads, alloy nipples, and superlight tubes can make a bike feel considerably faster and easier to pedal. In some conditions the added weight of suspension can also provide efficiency.

Frameset Materials

Although it flies in the face of popular bicycle culture, the material the bike is made from is less important than the design of the frame, and the quality of manufacture. In other words, two bikes of the same material, with the same geometry, can ride very differently. Conversely, with clever engineering two bikes of different materials and geometry can be made to ride very much alike.

Its easy to guess at the effect tubing shape and diameter might have on a bike. But you can't see wall thickness or butting to second-guess their effects. Nor can you tell the strength of a weld from the way it looks, or how stiff the resulting joint is. However, each of these details do have an affect on the ride, and a thorough test ride will say much more than a quick generalization on frame materials.

So how do you discuss frame materials with the customer? First, don't over generalize about what a material's characteristics do for the bike as a whole. Explain to the customer how the blend of materials, design, and manufacturing quality result in a better riding bike for the way they ride. Materials, geometry, and frame features are just that; they're features. What your customer needs to know is the benefits they will achieve with those features.

Frame materials and their most tangible benefits

Hi-tensile steel

Steel comes in lots of different alloys, or mixtures of material. By adding different materials to the steel, various properties can be achieved. 'Hi-Ten', or Hi-tensile steel, is a strong steel alloy with good stiffness characteristics which make it ideal for value-priced bicycle frames.

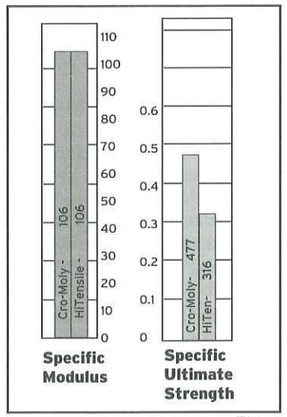


Fig. 1

Cro-Moly steel

This is a higher strength steel than Hi-tensile. With the added strength of Cro-Moly, tubing walls can be thinner resulting in a lighter bike. Cro-Moly and Hi-tensile steels have the same material stiffness (Fig. 1), so tube diameter is more important to frame rigidity than which steel is used. However, the thinner tubes made from Cro-Moly provide resilience, or 'snap' to the frame. This makes the bike feel lively, like it wants to go fast.

Aluminum

Aluminum has a lower density than steel, so more volume of material can be put into a bike at the same weight. In other words, the tubing can be both bigger diameter and thicker walled (important because thin walls dent easily), which can make the bike stronger, lighter and stiffer. More material is used, yet well designed aluminum frames can weigh a pound less than a Cro-Moly frame of comparable performance.

Titanium

This material is higher density than aluminum, yet much stronger. The extra strength means you can take frame material out to lighten the bike. But because titanium weighs more per volume than aluminum, making a lighter frame requires using smaller diameter tubes (large diameter with less material means excessively thin walls) so the overall stiffness is reduced for a frame of comparable weight. Some riders refer to the flexibility as 'liveliness'- see Cro-Moly steel).

Carbon fiber composite

This material is extremely low density (weight per volume), so a frame can be built that compares to an aluminum or steel bike, yet weighs another 1/4 pound less than the aluminum frame. Carbon fiber composite consists of many layers of directional carbon fibers. A frame designer can use different numbers of layers, or change the angle of the fibers in a given layer to 'tweak' the frame for ideal flex and strength. Carbon construction allows a bike to be butted where ever it does the most good, allowing the frame to be both lighter and stronger.

For more detailed discussion on frame materials science, see Frame Materials, page 6.

Step 3- Compare the specs

Once consumers have decided on what type of bike riding they are interested in and the frame material that best suits their price or performance considerations, give them logical, objective information and guidelines with which to compare the bike's specs.

Compare the Wheels First

We want consumers to think about and understand how much the wheelset effects a bike's riding characteristics. If all other things are equal, they should choose the bike with the better wheelset.

Wheel Features/Benefits

Better bearings	Longer life, less maintenance, lower rolling resistance
Lower weight	Less rolling resistance- less required acceleration
Fewer spokes	Less wind resistance
Machined sidewalls	Smoother brake application
Eyelets	Stronger, distributing spoke stresses over a wider area of the rim. Lower friction on nipples makes truing easier, lowers maintenance
Stainless spokes	Rust resistant, strong
Double butted spokes	Lighter, allow more stretch so wheel can absorb more force to stay true longer
Alloy nipples	Lighter (at outside of wheel where weight matter most)
Kevlar tire beads	Lighter
TPI (threads per inch)	More and smaller thread makes stronger casing even though lighter. Makes tire more supple for smoother ride, better traction.
Welded construction	Stronger. No rim seam so smoother brake application. Stiffer at joint so rim is easier to true.
Double/triple cavity	Makes lightweight rims stronger, stiffer.
Tall sidewalls	Easier brake adjustment. Less chance of brake pad dive or tire sidewall abrasion.
Rolf	see special Rolf section, page 18

Front/rear design	Makes front tire corner better, rear provide better traction (they're different!)
Heavy duty QRs	Keeps suspension fork blades working together.
Quality rim strips	Prevent punctures from rim spoke holes or spokes

Compare the suspension

And last compare the components. Remember, the small parts are the easiest to change as well as the least costly.

Step 4- Get Fit

Consumers report that comfort is their number one buying consideration. But comfort means different things to different people. To make sure the rider is comfortable:

• Define comfort relative to the style of riding the consumer expects to do.

• Communicate which adjustments can be made to optimize comfort.

• Educate the consumer about how to judge comfort in the test ride and initial period of ownership.

• Show specific comfort or performance enhancing features and benefits on a given model.

Positioning the rider:

There can be considerable variation within this fitting procedure because the rider's position is dictated by their riding style. As an example, BMX riders position themselves for handling, and simply stand up to pedal efficiently. As further examples, a given rider may sit further forward on a road bike than a mountain bike, and even further forward when on a triathlon bike. Their legs haven't changed, and neither has the most efficient angles at which they pedal. But the normal position of their handlebars has moved. Use the following as a starting point, but don't feel that you can't adjust further to best address the rider's needs.

Before positioning a rider on a full suspension bike, first tune the suspension for correct sag. As a bike sags, the bottom bracket moves, and this can affect their position relative to the pedals.

•Foot Position- The ball of the foot should be over the pedal spindle. The foot should be comfortably centered. At the bottom of the pedal stroke their heel should be either level or slightly up.

• Leg Position- Legs should never be totally locked at the knees or ankles. Thighs should not reach a horizontal or higher level. As a starting point, with crank arms parallel to the ground, the forward knee should be directly over the forward pedal axle to align leg muscles and ligaments for smooth, efficient pedaling.

Adjust fore/aft position of saddle, saddle tilt (which affects where the rider sits on the saddle) and saddle height as needed.

At the top of the pedal stroke, the thigh should be angled downward slightly to reduce strain and increase stroke power. Raise or lower the seatpost accordingly.

At the bottom of the pedal stroke, the knee or ankle should not fully extend.

Adjust the seatpost until the knee is slightly bent.

• Upper Body/Back Position

The back angle will vary depending on the type of bike selected and the handlebar position. The key consideration is that the hands reach the handlebars comfortably, without back strain. The elbows should be slightly bent to absorb shock and allow the upper body to move without steering the bike.

For Casual riding in Flat or Rolling terrain, an upright position keeps the head and back higher, which reduces the body movement necessary to see, and be seen. Less weight is placed on the hands and arms (and the front wheel). Body movement has less effect on steering.

Sporty and Training rides in Hilly terrain require that the body is in a slightly tucked position that places more weight over the front wheel for greater stability as speeds increase. This position lets the rider steer more with their shoulders, a more advanced technique. The greater angle between the back and thighs also allows more power to be applied by the big muscle groups in the legs and behind for better climbing and acceleration.

Racing or Pro intensity rides, or rides in Mountainous terrain require more efficiency. Aerodynamics become important for increased speed. This type of riding requires the ability to move in and out of the saddle easily. This rider will be more comfortable when weight is evenly distributed between legs and arms in a lower, longer position.

• Handlebar width and height

Shoulder width is a determining factor when selecting handlebars. The relationship of bar width to shoulder width determines the angle of the arms. If the angle of the arms is too narrow, breathing will be restricted. If the angle is too great, the shoulder blades can be compressed. Bar width also affects steering control, with wider bars providing greater leverage and 'power' steering. Narrower bars provide quicker reaction with less movement.

Also look at hand height relative to the pedals. The higher the hands, the less pressure on the hands, arms, shoulders, and shoulder blades for greater comfort. But if the pressure comes off the hands, it goes onto the seat!

The lower the hands, the more pressure on the front wheel for steering stability and control.

To best fit the bike, find the size that puts the riders hands close to where they want them. If necessary, switch stems to adjust further.

• Pedals

If street shoes are worn, a larger contact surface will improve comfort by spreading the contact pressure over a larger area. Good cycling shoes with a stiffened sole protect the foot's soft tissues, reduce fatigue of the calf muscles, and enhance pedaling efficiency.

Toe clips may be added to give a surface to push forward against on the down-stroke and pull up against on the upstroke, which spreads the workload over more muscle groups.

Toe clips position the foot properly with the ball of the foot directly over the pedal axle. Several lengths of clips are available to accommodate various shoe sizes.

Some cycling shoes provide for the mounting of cleats that snap into respective pedal systems to maximize power input and control of the bike.

• Seat

Fine tuning the saddle position is primary for comfort (see fitting section); height, tilt and the fore-aft relationship to the bottom bracket. The seat position should not be adjusted to merely move the rider closer to the handlebars; that's what stem length is for. Generally the saddle should be fairly flat across its upper surface. Combined with correct seat height and fore/aft position, this will give the rider comfortable support with a secure position to transmit pedaling power. With full suspension bikes, think about the change in saddle angle and position relative to the bottom bracket as the bike sags.

Saddle shape provides the foundation for contact pressure points to the body. The front of the seat needs to be narrow enough so it doesn't chafe the inner thighs. If the rider is bent aggressively forward, the narrow portion of the saddle must extend back to accommodate their legs which move back when the rider leans forward.

Proper support of the pelvis is vital to comfort. As a rider's pelvis is rotated toward an upright position, their pelvic bones move forward on the saddle. The saddle should be wider and the wide portion of the saddle should extend further forward to support their pelvic bones.

Women have wider pelvic structures, and they generally cannot lean forward on the saddle.

Tilting the nose slightly downward can help, as can selecting a saddle with more width, and the width placed further forward.

Saddles are available with a wide range of cushioning. Even a Racing or Pro cyclist can feel uncomfortable in the saddle if they've been off their bike for a while. Imagine the discomfort of a newcomer to the sport! The Sporty or Training rider will get used to the seat and appreciate firm support and what good support does for the transfer of power. Casual riders may want to choose a saddle with cushioning and/or springs.

Test Ride Criteria

Before a test ride goes out, you have the chance to win or lose the sale. To win, follow these steps:

• Give a preride control orientation.

Show how to work the braking system, the shifting system, and tell them what the bike is going to do that will make cycling more fun for them.

• Adjust seat and handlebar. On bikes with suspension, adjust that too.

• Have a Service Technician do a preride check over, making the usual checks.

Explain the procedure to the consumer so that they understand its importance.

• Fit a helmet for the test ride.

• Explain to the customer what to look for:

Tell the customer to pay attention to the fit of their body on the bike, the relationship between their seat and the pedals, how far they have to reach forward to the handlebars, and how high the handlebars are in relationship to the seat. Offer to make further changes during the test if needed. Instruct them to use the shifters and notice the "crispness" of shifting between gears.

After they have tested brakes and shifting, have them accelerate quickly and ride up a hill if possible. Ask them to notice frame response to power input.

Have them go around several corners at various speeds, looking for confidence inspiring characteristics. Ask them to notice the stability, ease of turning, and shock absorption. Tell them to try to duplicate the type of riding they expect to do.

After the ride, ask the rider about ride quality, likes and dislikes.

Carefully listening to their reply will help you better match them with a bike that will fulfill their expectations.

Step 5- Get them the accessories they need

There's more to cycling than the bike. What accessories do they need to make sure they ride as safely, comfortably and efficiently as possible? What do they need to keep their bike running well and protect their investment? Mostly, what else do they need to have the most fun?

Casual Essentials:

Helmet
Bike gloves
Bottle cages & water bottles
Under seat pack with tube, tire levers, patch kit
Pump
Bike specific lube
Kickstand
Security

For Sport and above, add these:

Bike shorts
Jersey
Floor pump with integrated gauge
Vehicle bike rack
Cycling shoes

For Training and above, they should consider:

Tools
Computer

For Racing and above, they know they want:

Heart rate monitor

Frame Materials

Materials Science

As a bicycle salesperson its important to understand some things about materials. The problem with such a discussion is that when we talk about topics like tensile strength or fatigue resistance, we're referring to materials science. When we give numbers and graphs of a material's properties, we're not talking about the complicated structure of a bicycle, but to a block of solid material on a laboratory bench. How the material is used in a structure, a tube's wall thickness, its butting, the care in its welding and heat treatment, these all have as much or more effect on the bicycle than the material itself.

And why are all these properties important? Because the material is supposed to make the bike ride better. It is difficult to market, but the best material is not the one that scores highest on a single lab test like yield strength. It is the one that makes the best bike frame by having the best combination of properties.

6061 vs. 7005

A good case in point is comparing 7005 aluminum to 6061. In bench tests, 7005 has slightly higher properties in fatigue and yield than 6061. Since the density of each material is very close, that makes 7005 look pretty good on paper.

But in different tests, 6061 has greater elongation than 7005. Elongation is the ability to stretch without breaking. Another material with low elongation is aluminum with aluminum oxide reinforcements, like M2. The reason that lab properties and bike frames will behave differently is that the lack of elongation is likely to cause an increase in cracking near the welds due to welding and heat treating stresses. All welded frames have lots of cracks in them. They are just small enough so that their growth rate to reach critical size is slower than the frame's lifetime.

From testing actual bike frames, we found that its necessary to use more material in a 7005 frame to prevent breakage under extreme loads. So of two frames of comparable durability, a 7005 frame will be slightly heavier than a 6061 frame.

OCLV

We developed OCLV in 1992. Optimum Compaction Low Void means that we are making a carbon fiber structure with laminate quality surpassing the requirements of aviation. The aviation industry knows that air bubbles, even tiny ones, can cause the laminate to be weak. In OCLV, we end up with less than 1% voids. Other carbon construction processes, especially thermoplastic, commonly end up with 5% or greater voids. Although that 4% difference may seem small, it really means about a 30% difference in structural strength. The frame designer will know they can't get sufficient strength, so they add material for thicker walls, or internal reinforcements to try and add strength.

When you add thickness, or ribs, or anything else, it changes the weight and feel of the frame. Heavy, thick-walled tubes tend to feel dead and heavy. Although some companies market this feel as 'damp' or 'shock absorptive', the thin walls of an OCLV bike make it feel alive under you. An OCLV frame feels like it always wants to accelerate. That fast feel is more than a sensation. Light bikes transmit less shock to their riders, who thereby save energy and go faster.

OCLV HC

The stiffness of a tube is mostly defined by its outer diameter. So, if you want a tube to be stiffer, you should make it bigger in diameter, not thicker. But flat surfaces are different. When you look at the stiffness of a flat surface, think about its two surfaces like the outer walls of a tube. The further apart, the greater the stiffness.

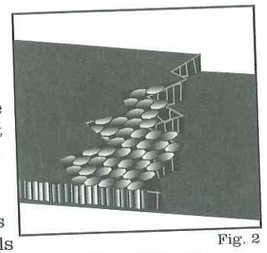


Fig. 2

You can separate the surfaces of a flat section by simply adding material. But even with a low-density material like carbon composite, this adds weight. What we have done is separated the carbon surfaces with a hollow honeycomb in a sandwich construction (Fig. 2).

This is a honeycomb sandwiched between two lightweight layers of carbon fiber that meets our stringent OCLV standards. By separating the carbon skins, a huge amount of rigidity is added. As an extra benefit, the honeycomb constrains the individual carbon fibers, keeping them in an orientation where their strength is maximized.

It might seem that the open honeycomb weave would fill up with epoxy resin; but not with OCLV. OCLV is both a material and a process, and its a process so unique we were able to patent it.

Steel

Over the past years Trek has offered fewer and fewer steel bikes. Is this because steel isn't a good frame material? No, its simply that we are asked for more aluminum frames.

If you ignore its density, steel is both stiffer and stronger than other frame materials. It has excellent fatigue resistance, and is relatively easy to work with. Steel's main raw material, iron, is abundant and easy to recover, making steel inexpensive. Steel bike frames make excellent performing bikes at a relatively low cost, allowing for value to be placed on components. Steel frames can be made to feel 'lively', yet be stiff enough for good steering control and pedaling efficiency.

Cro-Moly steel and high tensile steel have the same stiffness, so both materials can be used to make nice bikes. The difference is that Cro-Moly steel is stronger, so less steel is necessary to have a bike of the same strength.

While the material used to make a bike is important, there are many other factors which influence how it rides. The geometry, the tubing wall thickness and diameter, even the quality of manufacture all have an affect. When all is said and done, the frame material is only one factor in how a bike will ride. You still have to get on it and try it to see how the whole package interacts.

Bike Geometry and Fit

The 2 functions of bike design

When designing a bike, or looking at geometry charts to find a bike for a customer, there are two things to accomplish. The bike must fit well, and the bike must ride well. As a side note, its usually required that the bike fit well to make it ride well.

#1 is Fit

First and foremost the bike must fit well. The critical issues are the relationships between the saddle, the pedals, and the handlebars. These are the points of contact between rider and bike. Most geometry charts fail to locate these points, making the charts virtually useless for fit information. We intend to change that.

The old way to fit a bike

You'll notice that this list does not include standover height, a popular but outmoded gauge for fitting bikes. It wasn't many years ago that almost all bikes had horizontal top tubes. If we assume that those bikes had a fairly narrow range of bottom bracket heights, and that all stems were pretty similar in the amount of height adjustment they offered, that meant that the top tube could be used as an indicator of handlebar height, as well as seat height. Even so, standover did not take into account reach, an important part of fit that accounts for the distance from the saddle to the handlebars. So standover sort of worked as a fitting guide.

Today's bikes have lots of bottom bracket height variation, they use sloping top tubes, and many of them use Ahead type stems with varying rise, or riser bars. So having a rider straddle a modern bike can no longer tell us if the bike fits. Standover only tells us if there is sufficient room for the rider to dismount safely, a performance issue.

The right way to fit a bike

So how do you fit a bike? The professional shop will start with a persons overall height. Since their height is comprised of their inseam length added to their torso length, with their head height added in, this is a good starting point. Granted, there are more accurate ways to size a bike, but overall height is something most of your customers already know, and it leaves out sophisticated measuring techniques which tend to be inconsistent if done by untrained personnel.

The next parameter for fitting the customer to a bike is riding style. Each bike design has a style of riding in mind, whether its cruising a bike path, charging down a twisty singletrack, or sprinting up a mountain in the Tour de France.

On each Trek we have suggested an overall height range per size and model of bike. The sizing and intended use of the bikes vary, and so do the suggestions. As an example, a 6' tall rider might ride a 21" hybrid, a 19.5" mountain bike, a 23" touring bike, and a 58cm road bike. This is because each type of bike is designed to fit and perform differently, but the rider may want a similar position on each bike. From each of these bikes, you can then make subtle changes to make the bikes fit their best. These changes include moving the seat vertically, moving the seat horizontally, moving the stem vertically (through adjustment or moving spacers), or changing the stem for horizontal or vertical adjustment.

Since the easiest of these, with the widest possible adjustment, is the seat height, seat tube length should be the least of our worries. And since the hardest of these is changing the stem, the most efficient way to fit a bike should be to choose a bike with a frame design and size that places the handlebars where the customer wants them. Wants is an important word here: don't try to mold your customer to the way you ride your bike. Certainly you can suggest ways to make their riding more enjoyable, but its their bike. Size the bike to their riding style.

Bikes should also be sized based on rider experience levels and how much they anticipate riding. For example, a person buying their first bike who begins to ride seriously will find that he/she becomes more flexible in the hips as they put in the miles. As they gain flexibility, the bike that fit comfortably with a 120 stem will need a 140 to accommodate their physically fit new body.

So what tells you where the handlebars are?

In this year's technical manual we have included a dimension called handlebar height (B, Fig. 3). This is the vertical distance from the center of the pedal spindle, with the crank at the bottom of the stroke, to the center of the handlebar at the grip. Combined with the reach (A, Fig. 3), or horizontal distance from the handlebar to the seatpost at the top tube/head tube junction, you should be able to identify the right size of bike within each model.

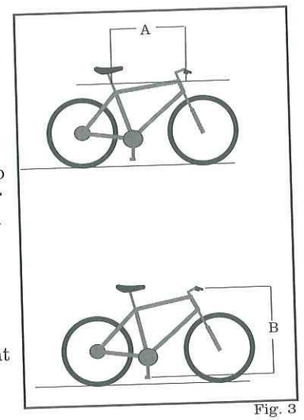


Fig. 3

If your first pick of bike size was not satisfactory for the customer, you have three alternatives. You can move to a different size, select a different model which offers the desired size, or customize a bike to achieve the desired size.

Once the size of bike is chosen, some simple fine-tuning can create a professionally adjusted bike. This level of service is what sets you apart from big box stores. Shame on the 'professional' employee who does less!

Geometry and performance

Bike design also effects performance. The geometry charts show some of these parameters, such as bottom bracket height, or head angle. What they don't show is how some of these factors work together. As an example,

changing the length of the chainstays can change the way a bike steers. When all is said and done, a geometry chart is only an indication of how a bike will ride. You still have to get on it and try it to see how the whole package interacts.

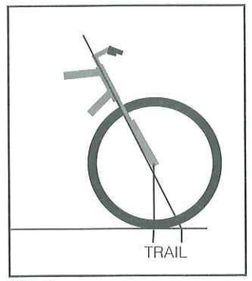


Fig. 4

Trail (Fig. 4) is the measurement on the ground of the distance from the steering axis to the contact patch of the front tire, measured by a vertical line through the front axle. It is the effect of fork rake combined with head tube angle. If by changing the rake, a 90 degree head tube and a 60 degree head tube both have the same trail, the bikes will feel identical as long as the front/center is the same.

Trail is more important than head angle in determining the steering feel of a bike. The head angle describes how direct the steering input is (quickness) but trail dictates the feel (heavy or light, stable or twitchy). Another factor is the weight on the handlebars. The more weight placed on the bars, the stronger the effect of the trail. So if you take a quick steering bike and puts lots of weight on the bars, it may become truck-like. On the other hand, if you take a really sluggish bike with heavy steering and put all the rider's weight on the rear wheel (like when climbing a steep hill) the front end may feel too light to control. To accommodate this effect, we adjust head tube angles to adjust the trail, so Trek bikes handle consistently through their size runs.

Bottom bracket height effects the rider's center of gravity. The higher the center of gravity, the less stable the bike is. But the closer to the ground, the harder it can be to move in situations requiring agility and quick handling.

Bottom bracket height also affects the height of the saddle off the ground. The higher the saddle is from the ground, the harder it is to get on the bike. A high bottom bracket can make it hard to get started on a bike for people with balance problems such as older or younger riders, or those with mobility problems, or with a fully loaded touring bike. This is one reason why we try to lower the bottom bracket on bikes in the Casual performance range, and Kids bikes.

Another factor when considering bottom bracket height is pedal clearance. For road bikes, this can effect the rider's ability to pedal through corners in a criterium. With full suspension mountain bikes, the suspension allows the rider to sit and pedal through terrain where they would have to stand and coast on a hardtail, such as areas with large rocks sticking up. But if the bottom bracket is so low that the rider hits their pedals on those same rocks, they can't pedal anyway, so they could lose one of the advantages of full suspension.

Handlebar height (head tube length) is critical for comfort. And since most bikes don't have a lot of adjustment (some special headset/suspension systems don't have any!), its critical that the head tube be a length that places the handlebars at the right height.

Some bikes use the same head tube length on all sizes, or don't offer the ability to change the stem height without turning the stem over. This missing adjustment drastically reduces the riders ability to get a comfortable ride. Trek direct connect steering systems use size specific stems with 20mm of spacers. On Trek bikes, even models with only 3 sizes have lots of adjustment. On the VRX 500, the handlebar height range goes from 845mm to 954mm, or over 4" of adjustment with 15 hand height choices. And that's without flipping the stem.

Front/center is the distance from the bottom bracket to the front wheel axle. Since a rider should first be positioned relative to the bottom bracket for optimum pedaling efficiency (fore/aft and height adjustments of the saddle), this dimension tells you how far in front of the rider the front wheel will be. The placement of the front wheel relative to the rider's center of mass effects both weight distribution and stability.

Weight distribution is how the rider's weight is spread over the two wheels. Frame geometry has something to do with this, but so do accessories like riser bars which raise the hands and place more weight on the saddle. As discussed above in Trail, this will effect steering. It also effects rear wheel traction when climbing. The closer the center of mass to the pivot point of a turn (the rear wheel contact patch, as described by chainstay length) the quicker a bike will turn. As an example of this phenomenon, try doing a low speed turn from the front of a tandem.

Tubing diameters, materials, frame flex, and alignment all affect how a bike rides. Geometry charts only refer to lines in a two dimensional drawing. Many more things go into making a bike handle the way it does. The frame material, the tubing wall thickness and diameter, even the quality of manufacture all have an affect.

Its a package

To truly discuss the way a bike performs with a customer, its important that you take the time to test ride the bikes you are selling. Test each model in the manner you will instruct your customers to follow. Perform a series of exacting tests during the ride to highlight strengths and weaknesses in handling and comfort for a typical type of riding. In other words, it doesn't make sense to test the singletrack capability of a city bike. Neither is it required that a road racing bike give a 'heads up' level of comfort. But understanding what each bike does well will help you match your customer to the bikes on your floor. Only when you have this knowledge can you offer more than the guy at the big box store who just talks about rear derailleurs.

Women's Specific Design (WSD)

Most bikes are built for men

For years women have been riding bikes designed partly, if not totally, for men. Their dealer may have made a few parts substitutions which made their men's bike work pretty well for them, especially in larger sizes where the physiology differences between men and women are not as great. But smaller women, who vary more from smaller men in physiology, suffered not only fit problems but performance gaps as well. Riding serious off road terrain with less than perfect handling can take a lot of the fun out of mountain biking.

More than a dropped top tube

The new WSD bikes are spec'd with women's specific components, like saddles, bars, and crank lengths. The WSD mountain bikes have women's specific suspension forks with softer springs. Both WSD road bike models get a custom ICON Carbon Classic fork for 650c wheels, so that woman riders will get the extra comfort of a carbon fork. So while most 'women's' bikes make due by just tweaking a mens bike with a few add-ons or maybe a dropped top tube, we completely redesigned these bikes to meet the needs of performance oriented smaller women.

Women sit on a bike differently

There are several major differences in how men and women sit on a bike. The most obvious and most discussed is the pelvic structure. A woman's hips are wider, and the bony protuberances we all sit on, called ischial tuberosities, are also wider apart. This accounts for the popularity of women's saddles that are wider in the back than a man's.

A man's pelvic structure allows him to roll his pelvis forward on the saddle and lean forward aggressively. For most women, this hurts. The result is a woman sits on a bike seat with her pelvis in a more upright position, making it difficult to lean forward. Combine that with a woman's shorter arms for comparable overall height, and the handlebars are hard to reach for the smaller woman on a man's machine.

Adjusting geometry to fit women

Trek engineers addressed these issues in several ways in the new WSD geometries. To support their wider pelvis, women tend to sit further back on the saddle. With a steeper seat tube, the seat can be positioned placing the hips over the cranks for optimal power, while her butt is on the most comfortable part of the saddle. To adjust the reach for a more upright angle to the back, a shorter top tube is used. The handlebars are place higher by using a taller head tube, so her shorter arms can be at a relaxed angle for steering control and shock absorption.

These adjustments put the rider in a more comfortable, and powerful position. That makes hills easier and long rides less tiring. A common complaint among women riders is back pain, and the correct position goes a long way to alleviate this problem. Adding to the comfort on road bikes, we used smaller wheels which allow longer frame tubes. Longer tubes flex more for more shock absorption, an equation that usually works backwards where smaller bikes are stiffer than big bikes with heavier riders.

Some of the corrections Trek made to these frames can be made to a men's frame with similar results, especially with taller women where physiology does not vary as much from a man's. But any frame will handle its best with the weight distribution applied in a certain way, and a men's frame is designed to have a man's heavy shoulders pressed firmly onto the handlebars in a bent over position. When you put a woman, who already has lighter shoulders, in a more upright position, there is much less weight on the front wheel (Fig. 6). The result is much less steering stability and the bike becomes harder to control.

Steering and weight distribution

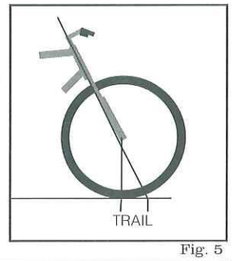


Fig. 5

Steering stability on a bike is a combination of trail and centering force. Trail is the distance from the steering axis at the ground to the tire contact patch (Fig. 5). But for trail to make a bike stable, there needs to be weight on the bars to apply a centering effect. The greater the weight on the bars the more stable a given bike will be. This is why a touring bike with front panniers is more stable than it would be with only rear panniers.

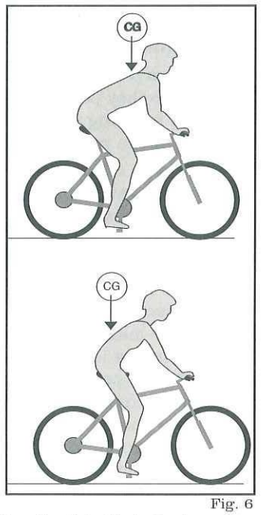


Fig. 6

A smaller man on a small bike still applies plenty of centering force for good steering and handling. To achieve a similar amount of steering stability for a small woman in a more upright position, more trail is needed. Not only does stability lend confidence to the rider, it also means that less strength is required to hold the bike in a line. This again addresses an important difference between men and women, that of upper body strength. By decreasing the head angle of the women's bike, she will get similar handling with a similar 'feel' to that designed into a man's bike for a man.

650c wheels

WSD road bikes use a slightly smaller diameter 650c wheelset. The smaller wheels, popular with triathletes, are lighter and easier to accelerate, an advantage for riders with less horsepower. The smaller wheels have less gyroscopic force, so the WSD bikes handle more nimbly. This also addresses a perceived safety issue of toe-clip overlap created with short top tubes

Bontrager Components

Saddles

When Keith Bontrager designed his first saddles, he was actually able to get a patent for his ideas. With careful analysis of how a saddle was used, his concept was to pare away the parts of the saddle which are not weight bearing. That is, some parts of the conventional saddles in use were just hanging in space, yet managed to get in the way when the rider attempted technical maneuvers. And why have material on the bike which isn't doing anything? It just adds weight.

His first designs are still being made today (and heavily copied), but Keith has brought fresh inspiration to a new model line called the FS. The saddle shape has a slight bucket to allow a rider to 'settle in' to their favorite spot. They also feature a widened saddle nose. The wider FS+10 has just a bit more padding for those so inclined which also makes it about 10mm wider overall.

Prior to Keith's design, conventional wisdom was that a wide saddle nose would interfere with pedaling. Keith noticed that the front of the saddle is in front of the rider's legs, not between them. By widening the nose, the FS saddle offers support for the rider who has slid forward on the saddle in a climbing position. To get the most from this feature, the saddle nose has just a touch of suspension from an elastomer pad between the rails and the shell.

RE-1 Clipless Pedals

Clipless pedals have become a mainstay for off road riders because they position the riders foot on the pedal for increased pedaling power on the climbs and flats, and then keep the feet in position on technical or rough descents.

However, other facets of off road riding can make clipless pedals into a problem rather than an asset. Mud and grit can render clipless pedals almost worthless by first preventing entry with contaminated cleats, or worse by trapping the cleat in the pedal and preventing release.

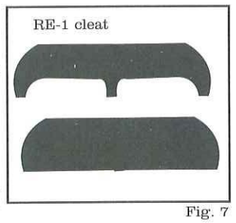


Fig. 7

While most mechanism are pretty good in clean, dry conditions, they make no allowance for crud in the interface between the cleat and pedal body. By cleverly removing material, Keith was able to design a cleat that allows room for crud without sacrificing retention (Fig. 7). This new cleat will work perfectly with Shimano SPD 535s and 747s for those who like a slight amount of rotation.

To get the full benefit of this design requires the use of the RE-1 pedal. This pedal has been 'ported' to make room for excess crud to move away from the mechanism. They also have excellent seals, bearings, and fastener hardware to make these pedals work as well and long as anything on the market.

Rims

Bontrager rims came about when one day Keith realized that a 36° 700c rim could have 4 spoke holes cut out and be the exact diameter needed for a 32° mountain bike rim. By rolling these cut-down rims to a 26" diameter,

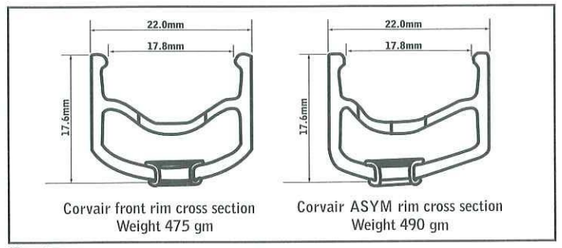


Fig. 8

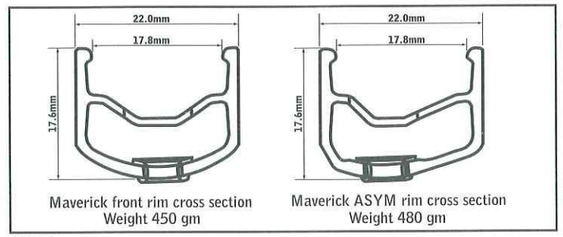


Fig. 9

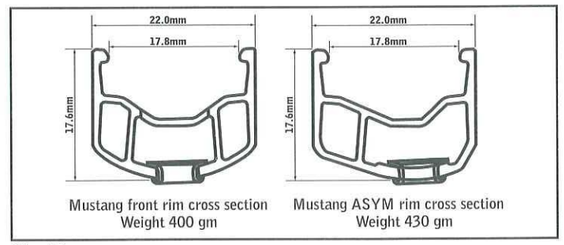


Fig. 10

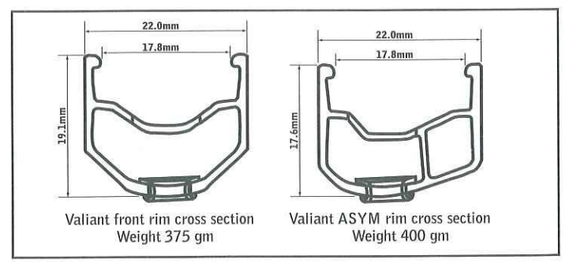


Fig. 11

Keith made the first prototype of modern mountain bike rims; light, narrow and super strong.

Since then, Keith has designed his own extrusions, adding features like tall sidewalls for increased braking surface area. This helps prevent pad dive, or tire sidewalls from being eaten by the brake pads. All Bontrager rims (except the Disc specific versions) have these tall sidewalls, but Keith goes to great lengths to make sure those taller sidewalls still have the strength to resist impacts in the case of a flat tire, a detail overlooked by many attempts to copy his ideas.

The Corvair and Maverick rims feature double cavity construction, where the internal bracing adds stiffness and strength

to the rim while reducing weight. The Mustang and Valiant rims use a triple cavity design, where even more weight has been removed.

All Bontrager rims are a welded construction, avoiding the twisting that can happen at the joint of a pinned-construction rim in an accident, or when building it up. The Bontrager rims on Trek bikes are all eyeletted, where reinforcements are added to the spoke holes of the rim. This distributes the spoke stress over a wider area, and also provides a lower friction bed for the spoke nipples. Finally, the rims are machined for a flawless braking surface. This machining also removes any anodization which could reduce brake pad friction.

A final detail developed last year was the Bontrager ASYM rims. These rims have an assymetric shape which offsets the spoke bed further from the freewheel (or disc brake in front). This offset moves the spoke bed such that the angle difference between the drive spokes and non-drive is lessened, reducing the wheel dish. by reducing the dish, more even spoke tension is achieved, resulting in a stronger wheel.

Bontrager Hubs

Bontrager hubs use high quality bearings, races, and cones. They have particular attention to seals to maximize hub life and reduce maintenance.

Comp I front hub

The Comp I hubs use a conventional cup and cone design, with contact seal, on a Cro-Moly axle. The bearing surfaces of the Comp I cups and cones are "as forged", a design which is intended to wear in with use. As such, a new hub may show some roughness when you spin the axle. This is mostly from being adjusted just a touch tight. With the first few miles, this design will wear in and smooth out. You can adjust them to feel great when new, but they will soon need to be readjusted. If the hub does not get this critical service, it will wear faster, so we feel its better to leave them set so they will wear in to correct adjustment.

Comp I hubs also use a rubber external seal, which will exhibit quite a bit of drag when new. We considered a looser seal, but after its break in period a looser seal would not be as effective in protecting the bearings from contamination.

An important feature of the Comp I hubs is its compatibility with oversized, 6mm quick release rods. Combined with the oversized 23mm axle end caps, this increases the stiffness of the hub-to-fork connection. This stiffness improves steering control when used with a suspension fork.

Spoke hole PCD	38.0mm
Flange width	71.4mm

Comp II front hub

Comp II hubs are very similar to the Comp I, except they have ground and polished bearing surfaces on the cups and cones. This allows a smoother initial adjustment that shouldn't change much during initial use.

Spoke hole PCD	38.0mm
Flange width	71.4mm

Comp II rear hub

The Comp II rear hub uses both internal and external rubber seals for bearing protection. A Cro-Moly axle with 19mm end caps uses a 5mm quick release rod. The comp II rear hub also uses ground and polished bearing surfaces for easy maintenance and long bearing life.

Spoke hole PCD	45.0mm
Flange width	57.3mm

ICON Components

ICON is a complete line of premium bicycle components. Driven by advanced technology, ICON components are specifically engineered from the ground up to fulfill the requirements of the serious cyclist.

Every detail of an ICON component's design is carefully scrutinized by a team of engineers to maximize strength and function, while minimizing weight. As an example, the inner walls of the bar ends, stems and handlebars are butted to shave weight. At the same time careful concentration of material adds durability in key stress areas.

Premier ICON components are formed from a proprietary one-piece, cold forging that leaves no welds to break or bonds to fail. This forging leaves grain alignment that is always placed in the direction that will yield the most support. This makes ICON parts over 40% stronger than conventional forgings.

With conventional forging, extensive machining may be required to attain the part's final shape. Like with a CNC'd part, as the machining chisels away material it leaves thousands of tiny stress risers. The ICON forging process gives a very clean final shape with little or no additional machining necessary, further enhancing strength and fatigue resistance.

Fatigue life is increased on the surface as well, using a proprietary finishing process developed by the aerospace industry. A final touch of elegance is added with laser-etched logos which augment the sleek look and are less susceptible to wear than decals or paint.

Because the ICON forging process eliminates extra material, ICON parts are very light with the highest strength-to-weight ratio possible. Still, all ICON products are fully tested for fatigue, energy absorption and impact, so we know they will withstand the stresses of hard riding. As insurance of this quality, all products have a visible date code so that each can be traced to exactly when and where it was produced.

Crushed Velvet ATB Handlebars

Constructed from thermoset carbon fiber, the Crushed Velvet's butted profile is thin where material is not needed, yet bolstered at the stem clamp and near the ends which eliminates the need for B.E.R.T.s (Bar End Reinforcement Thing). **Do not cut Crushed Velvet handlebars to a narrower width.**

The seven degree sweep puts hands in a natural angle for a comfortable, relaxed feel.

580mm width 127 grams

25.4mm bar clamp diameter

Ernie ATB Handlebars

The 2014 aluminum of the Ernie is stronger than 6061 T6. By using this high-end alloy with a design that also uses 7° bends for more wrist comfort, butted ends for strength where bar ends clamp, and ICON fatigue-resistant finish

580mm width 149 grams

25.4mm bar clamp diameter

Matador ATB handlebars

ICON design in butted 6061 T6 construction.

580mm width 182 grams

25.4mm bar clamp diameter

ICON ATB handlebars

Still high quality 6061 T6 aluminum, but plain gauge.

580mm width 220 grams

25.4mm bar clamp diameter

Diesel ATB Handlebars

The multiple bends of downhill bars leave less room for controls and hand space. Instead of making the bars wider, and consequentially heavier, ICON shrunk the center section of last year's Diesel to give hands more real estate with a minimal weight gain. Butted 2014 alloy.

620mm width, 7° bend, 30mm rise 272 grams

620mm width, 7° bend, 50mm rise 280 grams

25.4mm bar clamp diameter

Crevasse ATB Riser Bars

Like the Diesel, but in butted 6061 alloy.

620mm width, 7° bend, 30mm rise 276 grams

25.4mm bar clamp diameter

ICON Road Bars

Instead of the traditional curved shape, ICON road bars have a flat, ergo drop for a natural, more comfortable feel. The special bend also makes dual control levers easier to reach and operate. 6061 alloy. Sleeved center.

Widths: 38, 40, 42, 44, 46cm, center to center

410 grams in 46cm width

26.0mm bar clamp diameter

Swoop Ergo Road Bars

Instead of the traditional curved shape, the Swoop Ergo has a flat, ergo drop for a natural, more comfortable feel. The special bend also makes dual control levers easier to reach and operate. Stiffer for big riders or sprinters. 6061 alloy, bulged center..

Widths: 38, 40, 42, 44, 46cm, center to center

284 grams in 42cm width

26.0mm bar clamp diameter

Stash Ergo Road Bars

Like the Swoop Ergo, this is a very comfortable ergonomic bend that better fits the hands. The Stash is made from premium 7075 alloy to reduce weight without sacrificing strength.

Widths: 38, 40, 42, 44, 46cm, center to center

254 grams in 42cm width

26.0mm bar clamp diameter

ICON Hi-Rise ATB Stem

This direct-connect stem features a removable face plate for easy stem changes.

15° rise, 75, 90, 105, 120, 135mm lengths.

Steerer clamp diameter 28.6mm, height 41.0mm.

194 grams in 135mm length

Bar clamp diameter 25.4mm.

Durante ATB Stem

This direct-connect type stem is extremely light, even with a removable face plate for easy stem changes.

0° and 7° rises, 90, 105, 120, 135, 150mm lengths.

Steerer clamp diameter 28.6mm, height 39.5mm.

176 grams in 135mm length

Bar clamp diameter 25.4mm.

Bordeaux Road Stem

The quill-style Bordeaux brings to the road stem the engineering and user-friendly features that ICON is known for. A completely redesigned handlebar clamp utilizes a removable front face plate for easy handlebar switching. Add this to the laser etched logo, proprietary surface treatment and super-light hardware, and you get a road stem that is strong, stiff and elegantly simple.

0°, -17° rises, 60, 70, 80, 90, 100, 110, 120, 130, 140mm lengths

22.2mm insertion, 26.0mm bar clamp diameter

190 grams in 60mm length

Havanna Road Stem

The direct-connect Havanna shares the same new road-specific handlebar clamp as the Bordeaux. The steerer clamp and extension are a continuous piece of 6061 T6 aluminum forged hollow to give longitudinal grain alignment, minimal wall thickness, and no need for a rear weld. The result is an incredibly light and strong road stem with all of the standard ICON touches like proprietary surface finish and laser etched logos.

0° rise, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140mm lengths

25.4mm steerer clamp, 39.5mm steerer clamp height, 26.0mm bar clamp diameter

146 grams in 80mm length

Moses Seatpost

One-piece forged post of 6061. Differential wall thickness (the sides are thinner than the front and rear) for increased strength and lower weight. Single bolt saddle clamp for easy adjustment. Full ICON treatment of surface treatments and pad printed logo.

250, 300, 350mm lengths, 27.2, 31.6mm diameter.

220 grams in 250mm, 27.2 diameter

Oz Seatpost

Same construction as the Moses, but lighter with 2014 alloy. Laser etched logo.

250, 300, 350, and 400mm lengths, 27.2 and 31.6mm diameter.

189 grams in 250mm, 27.2 diameter

De La Sole Clipless Pedal

This new single-sided road pedal shows many of the ICON hallmarks. Minimalist design for ultra light rotating weight and great cornering clearance. SPD-style cleat attachment makes it compatible with virtually every shoe on the market. Plus, the ICON cleats have 6 degrees of float to make them knee friendly.

9/16" pedal spindle

270 grams per pair

Solemate Clipless Pedal

This double-sided ATB pedal uses SPD-style cleats on an ICON designed pedal body. This yields 4° of float. The special body design offers wider shoe contact for increased foot stability. This is especially beneficial when using anything other than top of the line shoes, where the soles are slightly more complaint. the extra support lets the rider put more power into the pedals, and balance better on descents.

Open ball bearings for long bearing life. Double sided adjustment for release tension.

9/16" pedal spindle 380 grams per pair

Tork Cranks

The top of the line Tork mountain bike crankarms are cold-forged 6061 aluminum for optimal strength and then precision-machined to exacting tolerances. The crank taper is CNC'd rather than broached to ensure a perfect chainline. ICON cranks are designed to be used with a 113mm Shimano bottom bracket spindle.

The electroless-nickel plated 7075 alloy chainrings wear longer than anodized aluminum rings, and the hard coating greatly improves shifting performance. The proprietary surface treatment enhances fatigue life. Add in alloy chainring bolts and the JuJu extractor bolts to get one of the strongest, lightest cranks with an ultra-low Q-factor!

44/32/22 rings, 9 speed compatible, JIS taper

4 arm design, 64/104mm PCD

170, 175 and 180mm arms

690 grams with 175mm arms, rings, bolts, and JuJu.

Crankshaft Cranks

Same arms and 3 anodized alloy rings. Steel chainring bolts. Standard crank attachment bolt.

44/32/22 rings, 9 speed compatible, JIS taper

170 and 175 arms

705 grams in 175 arms with rings, chainring bolts

Flywheel Cranks

Same arms and big ring as the Crankshaft. Steel 22and 32t rings provide flawless shifting and additional durability. Steel chainring bolts. Standard crank attachment bolt.

44/32/22 rings, 9 speed compatible, JIS taper

170 and 175 arms

754 grams in 175mm with rings and bolts

Fatty McGee bar ends

An oversized 28.6mm grip tube distributes pressure over a wider area of your hand to increase comfort. Low profile clamp eliminates protruding bolts which can damage the bike frame. ICON proprietary forging process for strength.

139 grams per pair.

Maggie bar ends

The wide surface at the upper surface of the ergonomic grip tube distributes pressure over a wider area of your hand to increase comfort. The smaller diameter underneath allows more powerful pull. Low profile clamp eliminates protruding bolts which can damage the bike frame. ICON proprietary forging process for strength without welding, bonding, grinding, or other machining.

99 grams per pair, short bend

109 grams per pair, ski bend

Crushed Velvet bar ends

Thermoset carbon fiber composite in an ergonomic shape. Cold forged clamp. Because they are carbon fiber, they have low thermal conduction (they don't feel so cold on cold days).

99 grams per pair.

Carbon Classic Fork

OCLV carbon composite fork with forged aluminum crown and fork tips, Cro-Moly steerer. The Classic is one of the most comfortable forks on the market, especially well suited for long distance rides, or lighter riders (that's why we made a special 650c version for the WSD road bikes).

Wheel size 700c and 650c

1" headset, threaded or unthreaded

Size specific offsets of 38, 43, and 47mm.

450 grams

Air Rail Fork

OCLV carbon composite fork with forged aluminum crown and fork tips, Cro-Moly steerer. The Air Rail is stiffer to resist lateral flex and splay (forward/rearward flex). Although stiffer than the Carbon Classic, the Air Rail's OCLV construction is still more comfortable than most steel or aluminum forks. Excellent fork for heavier riders, or riders wanting crisper handling and rock-solid feel when out of the saddle on hard sprints or climbs.

Wheel size 700c

1" headset, threaded or unthreaded

Size specific offsets of 43 and 47mm.

540 grams

Other Components

Shimano

ATB 9 Speed in '99

Although road bikes have had 9 speed shift systems from both Shimano and Campagnolo for several years, mountain bikers have been stuck in an 8 speed world. But in 99, Shimano is opening the flood gates on mountain bike 9 speed, going all the way down to the LX level.

By reducing the spacing and width of the cogs, Shimano has squeezed 9 cogs onto a standard 8 speed cassette hub with 135mm OLD. The other good news is that the gear range has extended. The standard low has gone from a 30T to a 32T, and there is even a 'Megarange' cassette with a 34T cog.

Since the cassette spacing is narrower, a 9 speed chain with slimmer proportions is in order. The 9 speed width is the same on road an mountain bikes, so you'll notice that on some ATB models we've spec'd the super high quality Dura-Ace chain.

To maximize shifting performance with the 9 speed chain, new chainrings were designed. The spacing between the chainrings is slightly narrower than 8 speed, plus the tooth profiles and tooth width is different. Shimano also boosted the size of the big chainring from a 42T to a racier 44T on all 9 speed cranks. The small and middle rings remain 22T and 32T as they were on the 8 speed cranks.

To get the full enchilada of Shimano shifting performance, the front derailleur cage has to be the right shape, width, and the shifting ramps have to be lined up correctly. 9 speed chains are narrower, and LX/XT 9 speed cranks have a 44T big ring. So a 9 speed front derailleur is needed to get the best shifting possible. Although the new XTR crank has the same number of chainring teeth as the old one, the new XTR front derailleur has improved link and differential plates for better shifting.

The 9 speed rear derailleur uses 11T pulleys to better shift the wide range 9 speed cassettes. It has the same cable pull as an 8 speed model, so this item can be subbed by the old 8 speed derailleur. But the newer version has a sweet new shape, extra booties for better cable sealing, and redesigned pivots for stronger shifts and longer life.

To get 9 gears in back, you have to have 9 speed shifters. The LX, XT, and XTR units all got a redesign for 9 clicks, but also with new lever shapes and lengths which are very hand friendly, repositioned barrel adjusters that are easier to reach, and more.

As an option, there is a new full-cartridge XTR bottom bracket. This design is slightly heavier, but the better seals and reduced maintenance are well worth it. Trek will use this new bottom bracket exclusively.

New Alivio

It would seem that Shimano would be busy with the redesign of all three upper levels of components, but they didn't stop there. The Alivio group has been greatly improved. With these upgrades, Alivio replaces the STX group and so will join STX-RC as an 8 speed group for '99.

Alivio also gets a 22/32/42T replaceable chainring set on a 4-arm crank.

New Acera

Acera finally offers lower gearing with a 22/32/42T chainring set which bolts to the arm in a single platter.

More Nexave

There are two levels of Nexave components for '99, bringing the exciting Nexave features to a more popularly priced hybrid market. Cost reduction was done through simple feature differences such as riveted chainrings on Nexave 300 cranks, and bolted on Nexave 400.

Other ATB improvements

Shimano has enjoyed several years of incredible success with their V brakes. The XT and XTR versions of these brakes use a linkage system which instead of following an arc to the rim, provides a linear path for the brake pads. Shimano says this provides increased stopping power. It also decreases pad dive, so the brakes have less tendency to go under the rim or up into the tire as the pads wear. Since the cartridge type pads on XT and XTR brakes are very thin, the parallel push wears the pads evenly to increase pad life.

Shimano has redesigned the XTR and XT models for '99. By lengthening the bearings of the linkage, and placing them further apart, the linkage has been made much stronger. This will decrease brake noise, while increasing the life of the linkage bearing surfaces. The redesign also allows the brakes to open up a bit further so tires fit through more easily, making wheel installation a breeze.

More 8 and 9 speed road

All we can guess is that fishing reels must be slow, because in addition to all the ATB improvements, Shimano revised the RSX and105 groups for '99 as well. 105 joins the upper end Ultegra and Dura-Ace groups in the 9 speed world, and RSX is now 8 speed. Both these groups are available as doubles or triples, and RSX is only offered in full-sized chainring sets.

Shimano has also introduced a new road pedal system at the Dura-Ace level. This system uses a new, wider cleat which requires a new hole pattern not available on '98 model or older shoes. What does a person do who wants to ride these new pedals? They buy new Shimano shoes, of course!

Manitou

New Features

After talking with a lot of shops and riders in the field, Manitou has identified one of the biggest losses of suspension fork performance as a need for lubrication. Stiction is a major problem since most riders rarely, if ever, lube their forks.

The Microlube system found on all '99 Manitous allows easy lubrication of the forks. Each fork leg has a small grease port on the back, near the top of the slider. A maximum capacity of 15 grams of grease gets the job done without the excess weight of a full oil bath. And the job can be done in mere minutes with special grease and applicators supplied by Manitou.

To further enhance a stiction free fork, Manitou is using a Sub 7 surface finish on the stanchions, which is 50% smoother than other fork legs. Combined with their NorGlide bushings, this also makes for 50% increase in durability.

SX

In '98, Manitou introduced TPC (Twin Piston Chamber) damping. TPC is found on the SX used on the 8000. This system has several key features.

- Separate compression and rebound damping, and true individual adjustability
- Large oil volume resists heat and cavitation
- Low speed compression flow

The SX used on the 8000 offers 70mm of travel, using MCUs for a progressive spring rate and a short coil spring for plushness. Preload adjustment is external at the top of the right leg. Beefy 28.6mm alloy stanchions coupled to a one piece die-cast magnesium slider assembly with leading axle design give lots of steering rigidity. Rebound damping can be adjusted externally at the bottom of the left leg. Compression damping adjustment is internal by removing the compression rod at the top of the left leg.

X-Vert-T

For '99, Manitou introduces a less expensive version of their successful TPC damping system called TPC Sport. This technology is on the VRX 400's X-Vert-T fork. The Sport system offers everything from standard TPC except adjustment of the factory-set damping. Like the original TPC, Manitou covers these forks with a 2 year leakage guarantee.

This double crown fork uses a butted alloy steerer, 28.6mm alloy stanchions, and a new 1 piece die cast magnesium lower. The X-Vert-T uses MCUs and a short coil spring for super plush ride offering 100mm of travel. Features of the new lower assembly include increased tire clearance, on a leading axle design.

RockShox

When RockShox introduced their new Superlight Integrated Design (SID) in '98, blue forks dominated the front line at races all over the world. For '99 there are 3 models of SID forks all with new features, as well as SID rear shocks.

New RockShox technology for '99 includes C3 Dual Adjust cartridges, HydraCoil damping, air spring rear shocks, and a new air inflation valve that's the same for both forks and rear shocks.

HydraCoil damping is an open bath system. This means all the forks internals are constantly bathed in oil. RockShox testing shows that while plush when new, a standard grease-lubed fork will have serious degradation of suspension action after extended use. The HydraCoil fork will feel as plush as a brand new grease-lube system after those same 100,000 test cycles. HydraCoil damping can be adjusted with oil viscosity and oil height, so now even the inexpensive Jett C can be custom tuned. Changing oil height also changes the spring rate, providing a 'hook' as the fork gets closer to bottoming.

Jett C

This fork is found on the Y 3 where its low 3.1 pound weight keeps the excitement in full suspension. The new Jett C offers 45mm of travel and an oil bath system for smooth operation. It has a short negative spring, so it initiates over small bumps to smooth the ride. The full elastomer spring gives a progressive feel.

Jett T2

Found on the 930 and 6000, the new Jett T2 uses a Type 2 spring with both MCUs and a coil spring. The coil spring makes the fork more supple over small bumps, while the MCUs provide a progressive feel as the fork goes deeper into its 60mm of travel. An oil bath system keeps the fork working smoothly with easy maintenance.

Jett XC

The addition of HydraCoil damping makes this fork ideal for the recreational user who rides a bit harder, or in rougher conditions. That's why we use it on the VRX 200 in a 75mm travel configuration. Its full coil spring gives this fork lots of plush action for bigger hits.

Judy C

The Judy line uses larger diameter stanchions, providing increased steering stiffness and control. This is important as the rider deals with more technical terrain, higher speeds, and tighter maneuvers. The Judy C on the 6500 uses full coil springs for 63mm of travel. HydraCoil damping keeps the quality of that travel at a high level. And the 12mm negative spring also fights stiction while making it plush over the smaller stuff. A special version with softer springs is on the 6500 WSD.

Judy XC

This fork is on the 7000 in a 65mm version, and the VRX 300 as a long travel fork with 80mm travel. The XC is a lighter version of the Judy C, due to aluminum stanchions instead of steel.

Judy SL

On the 8900, we're using a Judy SL because the low weight is critical for a racing bike, while the Judy's beefy construction lends itself to the use of a disc brake.

To keep the weight down, the SL uses Easton EA70 stanchions, an aluminum steerer, and the C3 Dual Adjust cartridge. This new cartridge provides both compression and rebound adjustment with a single external adjustment knob. Push it up for rebound, pull it down for compression. Using a cartridge also means the damping oil is different than the oil lubing the fork internals. By separating the duty of the oils, both will last longer and work better, an important feature for those riding more miles.

The SL uses full coil springs, but with only 3mm of negative spring. While it won't feel as sweet over small stuff, this keeps the fork firm out of the saddle. This is ideal for racers who climb a lot and want a stiffer fork.

Judy 100

On the 8500 LT, we wanted 100mm of travel so we needed something super strong, but we didn't want the extra weight of a double-crown model. The Judy 100 fits the bill with its oversized Easton EA70 stanchions and steel steerer.

The Judy 100 uses a full coil spring with 12mm of negative spring. HydraCoil damping keeps the travel light and smooth.

SID SL Ti

The top of the line cross country racing fork now has an externally adjustable air negative spring to replace 98's internally adjustable coil spring. Air is lighter than the coil so the fork weighs less. The negative spring can be easily matched to the main spring with the same pump. And the progressive nature of the air spring results in a very smooth transition off the negative spring, for incredible performance over bumps of all sizes.

A C3 Dual Adjust cartridge compliments this performance, allowing 4-way adjustability for any race course.

You'll find the SID SL Ti on both the Pro 9.9 and the Y SL 300, both in the 63mm travel format.

SID XC

This excellent fork offers all the features of the SID SL Ti, but without all the trick stuff needed to make it super light. As an example, instead of a hollow crown, its solid cold forged aluminum. Still premium suspension action, just a little less expensive. The SID XC is on the Y SL 200 and the XC 9.8 in a 63mm travel version.

SID XL

The VRX 500 needs a double crown fork with lots of travel. But its got to be light. The answer is the SID XL with 100mm of travel. Air spring, air negative spring, and C3 Dual Adjust cartridge make this a lightweight fork that can ride any terrain.

SID Rear Shock

On both the Y SL 200 and 300, we want rear shocks that are extremely light, and that match the superb action of the SID forks. The SID rear shock is the obvious solution. Air spring, air negative spring, and a remote compression damping adjuster on the handlebars let the rider tune to almost full lockout, on the fly. Not a true lockout, the SID has a blow-off valve so if the rider hits something major with the lever thrown, the shock can still react. This not only protects the shock, but the rider as well.

RockShox Seat Post

With 50mm of travel, this seatpost is a lightweight solution for comfort. Its simple, yet effective. On the 8500LT, its nice to have the saddle give a bit after your 100mm fork has let your hands ride free over a big bump.

Tuning to preference is easy by changing elastomer lengths and rigid adjusters, or by simply cranking the preload at the bottom of the post with a 6mm allen. This post uses a telescopic design, so there are no pivots to worry about.

Fox

Vanilla, Vanilla R

On all Fox shocks, including the adjustable ones, we work closely with the Fox engineers to set the damping rates to match our suspension systems. The shock we use in a VRX has different damping than one in a Y bike. In addition, we tune the damping in coil/over shocks to be specific to the spring force. The shock body with a 1050 coil is more heavily damped than when we use a 650 coil. We've set each size of bike up with a shock that we think will work best for the average rider. But not all riders are average. If you get a 130 pound rider who fits a Large VRX, or a 250 pound rider on a Small, they may need a different spring to adjust the suspension. Its usually best to swap the entire shock instead of just the spring. If you switch springs on a shock body and the rider is not satisfied with the damping rates, the shock can be shipped to Fox where they will custom tune the damping for the rider.

Hayes

In 1998, Hayes introduced their new fully hydraulic disc brakes. These brakes quickly became recognized as the best stoppers money could buy. Packed with features, strong on stopping power, and simple with low maintenance, they won our hearts.

Full Hydraulic Disc Brakes

For 1999, Trek models equipped with dual disc brakes will again use the Hayes fully hydraulic system. These brakes have a very light touch, with minimal pull required at the lever to get lots of stopping power.

The short lever travel feels unusual at first, but think of it as faster braking response. Rim brakes require a long lever throw to allow pad clearance for mud or out of true wheels. With a disc brake, lever travel can be very short with the pads very close to the rotor because mud or wobbly rims don't effect the brakes.

Although they have a different feel compared to a V brake, they actually modulate very well. The levers feature a reach adjuster to accommodate hand size. Once the pads are worn in, one finger braking is possible.

Unlike rim brakes, the Hayes discs will feel as good at the bottom of the hill as the top. Hayes uses an open system which automatically compensates for pad wear, or heat build-up of the hydraulics. An open system allows the volume of hydraulic fluid to readjust every time you let go of the lever. This means there is no pad fade. Dirt or mud have very little effect. And the pad clearance over the rotor is always the same. No more barrel adjusting your V brakes for pad wear.

Servicing Hayes hydraulic brakes is very easy. Since the open system automatically readjusts the pad clearance, there are only two service requirements in normal usage, after the initial caliper adjustment. Inspect the pads for wear and replace as need by pulling them out and sliding new ones in. This is a 2 minute job, with no alignment or adjustment necessary. If the lever seems harder to pull, this is an indication that the hydraulic fluid should be replaced by bleeding the brakes. Once you've learned how this is done, it takes about 5 minutes per brake, or less time than it would take to install new cable and housing in a standard brake.

Cable Actuated Hydraulic Disc Brakes

On bikes equipped with a single disc brake on front, we are spec'ing the new cable actuated disc brake from Hayes. On the full hydraulic unit, a master cylinder in the lever pushes fluid to the slave cylinder in the caliper, which then moves the pads. On the cable actuated brake, both the master and slave are in the caliper. A standard brake cable, connected to a standard brake lever, pushes on the master cylinder which is in the caliper. Hayes managed to squeeze everything into a fairly small unit, including the open system feature discussed above. So while we call this a cable-actuated brake, its important to understand that it is still a full hydraulic unit.

The benefit of a cable actuated disc brake is that mismatched levers feel weird to your fingers. With a cable actuated disc, a normal brake lever can be used. When a disc brake is combined with a V brake, the two levers will match. You can even use integrated shift/brake levers. By adjusting the variable cable pull on some levers, you can make the combination of disc and V have a very similar feel.

We really believe in disc brakes, and see a bright future for them. That's why we added rear Hayes mounts all the way down to the 6500, and added the extra weight of a disc mount to the Y SL swingarm for '99. Its important to notice that while some of our competitors are also using dual disc mounts on some models, they may not be Hayes compatible.

On the 8500LT and VRX 400 which are equipped with a single disc, the only reason we didn't use two discs is the cost. However, we've provided a rear wheel with rotor mounting holes, and a frame with a disc brake mount. All that's required is a longer cable and a rear caliper, making dual discs an easy upgrade for those so inclined.

Rolf Wheels

Rolf wheels set a new standard in wheel performance with patented Paired Spoke Design technology. Paired Spoke Design means Rolf Wheels are light, fast, and rock solid. Rolf Wheels solve all of the problems associated with conventional low spoke count wheels:

- Inherent radial and lateral rim deviations
- Truing difficulties
- Short fatigue life of rim and spokes
- Performance robbing weight increases

The key is the patented Rolf Paired Spoke Design. Lateral force at the rim, generated by the spokes, is perfectly balanced with Rolf wheels. This has many beneficial effects for bicycle wheels.

Rolf wheels have reduced spoke fatigue

As the wheel turns with a rider on the bike, the rider's weight presses down on the rim, and in turn, the ground presses the rim up toward the hub. As this happens with a conventional low spoke count wheel, the spoke at the ground is detensioned (Fig. 12). As the wheel rotates further, it is tensioned again. This cycle of stress and release may create spoke fatigue which can eventually lead to spoke or even rim failure. With Rolf wheels, the spokes are much more highly tensioned, and they're in pairs. Since the spokes are more highly tensioned, they lose less tension as they are released. They also share the load, effectively cutting it in half, so the tension change is less. With less tension change, the fatigue inducing cycle of loose-tight-loose-tight is greatly reduced. The result is less fatigue on both the spokes and the rim.

Rolf wheels have no rim wobble

Another effect of conventional low spoke count wheels is that as each spoke has its tension released at the bottom of the wheel, it allows the rim to move slightly out of true, so the wheel does not track straight (Fig. 12). With Paired Spoke Design, the rim runs straight because the pairs of spokes do not exert unbalanced force on the rim.

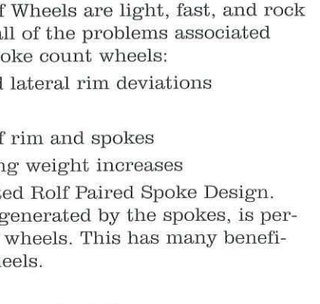


Fig. 12

When the rim runs straight on the ground, the wheel is more efficient. With less lateral wheel flex, the whole bike feels more solid. Don't confuse the solid efficiency of Rolf wheels with loss of comfort. The sensations of a laterally flexing wheel may fool you into thinking they are adding comfort, but that's not reality. The fact is that the rim has very little vertical displacement in a well built wheel. Wheel comfort comes primarily from the tire.

Rolf wheels stay true longer

Still another effect of the cycling of spoke loads is that as a spoke is detensioned, the nipple loosens. The cycling of spoke loads is a major contributor to wheels coming out of true. It may take a few miles before longer fatigue resistance seems important, but low maintenance is something a rider will appreciate every day.

Rolf wheels attack this problem in three ways. First, Paired Spoke Design allows higher spoke tension. With conventional low spoke count wheels, over tensioning can cause rim failure. With the higher tension possible in a Rolf wheel, the nipple has less change to get loose. Second, Paired Spoke Design means that spokes share the load at the bottom of the wheel so each spoke sees less tension change as its loaded. This keeps the spokes from being loosened as much as conventional spokes. Third, the lowest spoke count Rolf wheels, Vector Pros, use a custom alloy spoke nipple with a nylon insert to prevent loosening.

Left hand torque transmission

The reason Rolf rear hubs have their unique shape is to allow torque transmission to the non-drive side spokes. With a conventional hub, all torque is transmitted solely through the right hand, drive side flange. This is why many low spoke count wheels use radially laced spokes on the left side. But let's do a spoke count. If only the drive side spokes transmit torque, and only half those spokes are pulling, then only 1/4 of the spokes in a conventional rear wheel carry all the torque loads for the wheel. For a 32 spoke wheel, that's just 8 spokes. You can do the math on those other low spoke count wheels.

But on Rolf wheels, torque is transmitted through both the left and right flanges, so 1/2 the spokes carry the torque. In other words, a 16 spoke Rolf rear wheel has as many spokes transmitting torque as a 32 spoke conventional wheel. And each of those Rolf wheel spokes is paired so there is no lateral rim deflection and the Rolf wheels are more efficient!

There are three things required to accomplish this feat. First, the hub must be stiff enough. Rolf hubs use a large diameter barrel with increased wall thickness. This creates a very stiff structure. Second, the spokes must be laced tangentially. A spoke laced radially cannot transmit torque, but instead allows the hub to 'wind up' relative to the rim when torque is applied. And last, the left flange must be larger than the right. In this way, the left spoke is moving in a larger circle and therefore leads the right side spoke. This may all sound a bit strange, but we have instrumented Rolf wheels with strain gauges, and the data supports the theory.

The details of Rolf wheels actually go deeper than this. As an example, Rolf looked at other factors leading to premature parts failures in wheels and addressed them. All Rolf hub flanges have been specially designed with extra thick flanges to better support the spoke bend, reducing fatigue. Spokes in Rolf wheels have specially designed heads to eliminate the most common area of fatigue, the transition from the spoke shaft to the head. Prior to Rolf's analysis of this issue, a spoke went from a cylindrical shape to a cone in one sharp angle (Fig. 13). Rolf had spokes specially made with a smooth flare, removing the large stress riser created by the abrupt transition found on other spokes.

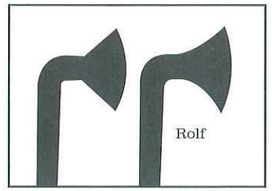


Fig. 13

After looking at Rolf's design, DT is in the process of changing all their spokes to this low-fatigue design. Some theorized that a straight pull spoke would remove the need for a spoke head altogether, but Rolf looked at the way a wheel 'winds up' from drive torque (or disc brake torque) and saw that the wind up would create a stress riser where the spoke exits the hub. A spoke fixed with its head axially (perpendicular to the spoke pull) would allow a slight rotation which does not incur stress to the spoke.

Technical information:

Paired Spoke Design allows a higher spoke tension because the rim does not see the unbalanced lateral forces found with alternating spoking patterns. With Rolf Vector Pro wheels with a 14/16 spoke design, this tension is greater than most tensionometers can accurately measure. The next best way to determine correct tension is to listen to the tone of the spoke when you pluck it, and compare it to that of a factory tensioned wheel.

Rolf spokes in Vector Pros are bladed 13 gauge so are much stronger than conventional spokes. Vector Pro wheels also use special self-locking alloy nipples for low weight and resistance to unthreading. Rolf nipples require a 3/16" nut driver or socket-type spoke wrench (stocked by Wrench Force tools) which will fit through the access holes in the rim.

Truing Rolf wheels

In many respects, truing Rolf wheels is just like truing a conventionally spoked wheel. Each spoke has both a vertical and lateral component to its pulling force. As you tighten a spoke, it pulls radially in towards the hub, and laterally out towards the hub flange.

The difference is that on a Rolf, the lateral force is directly opposed by its 'partner', the spoke adjacent to it. As the partner reacts to your tightening of a spoke, there is no further lateral force applied to the rim.

Contrast that to a conventionally spoked wheel where each spoke has two 'partners'. As you tighten one spoke, it is like trying to bend the rim between the two partners. A wave of distortion is passed by each partner, and affects the third spokes out on the rim as well. This is why over tightening a conventionally spoked wheel will eventually lead to rim failure, commonly known as the potato chip.

When truing Rolf wheels, the paired spoke design gives you more control over both vertical and lateral rim deviations. If the rim is slightly out of true but very round, you can loosen one partner and tighten the other. The rim moves laterally, but not up or down. And since no other spokes are directly affected, you're done. With a conventionally spoked wheel with a lateral deviation and no hop, you tighten one spoke, loosen two, and tighten both of the third spokes slightly to balance the tensions. 5 spokes are needed for the control of one spoke in a Rolf wheel.

When a spoke breaks in a conventional wheel, its two opposing spokes pull the rim in their direction. The third spokes from the broken one are now under greater tension, resisting the second pair. If nothing else was done to the rim, and the remaining spokes were carefully detensioned and removed, you'd likely find that the rim was actually bent in a gentle (or not so gentle) sine curve. Usually this can be trued out once the broken spoke is replaced, but you'll have to work on hop, and the tensions will be difficult to balance.

When a spoke breaks in a Rolf wheel, only half of the vertical force is found at the rim because the partner is still working to control vertical deviation. The rim will come very out of true due to the distance between pairs. But the next spokes adjacent to the missing spoke are still laterally balanced, so the rim is not bent. To repair the Rolf wheel with a broken spoke, simply replace the spoke and bring it back to tension. Normally you will not need to retension any other spokes to have a true wheel.

There is an unusual side effect of Paired Spoke Design that occurs when a spoke breaks. If a spoke is missing, the lateral deviation may barely pass through the brakes with the quick release open because the unopposed remainder of the pair is a long way from the next spokes. When the section of rim where the spoke is broken reaches the ground, its unopposed partner loses tension. Without a tensioned spoke pulling the rim sideways, there is no lateral deviation, and the rim runs true on the ground.

Vertical deviations

With wheels built in our factory, the tolerance allowed for vertical deviation is 0.5mm. A 23c tire with 120 PSI will exhibit more out-of-roundness than this.

Our wheel builders use a vellum, a highly sensitive truing stand that uses dial indicators driven by wheels pressing on the rim. When 0.5mm passes by the indicators on the vellum, the needles move about an inch. What looks like a mountain on the vellum will be totally missed by the rider, even at high tire pressures on smooth pavement.

With an egg-shaped wheel where 0.5mm height change occurs over 1/2 of the wheel rotation, the out-of-roundness may be invisible with a normal truing stand. If that same 0.5mm deviation occurs in a short rim section, its very visible to the naked eye.

With Rolf wheels, the same 0.5mm vertical tolerance is allowed, but instead of an egg shaped wheel it can show up over a very short section of the rim. In either

case, the rider will not feel it, nor will it effect the ride of the bike. Consider the much greater magnitudes in the out-of-roundness of a wheel. The tire will be out of round by 1-2mm on a 23c tire, more as the casing gets bigger. A rider sitting on the bike with that same 23c tire at 110PSI will compress the tire by another 2-3mm. And unless your roads are a lot better than here in Wisconsin, the road surfaces often have 5, 10, and even 20mm variation.

Rolf ATB

Instead of aerodynamics, Rolf ATB wheels focus on the other salient Rolf features: stiffness, strength, high fatigue resistance, and low maintenance.

Rolf ATB wheels are designed to be very user serviceable. They use standard spokes with standard external nipples. Of course, when we say 'standard', we mean the best quality from DT. Rolf ATB wheels also use Rolf specific box section rims with reinforced spoke beds. These extrusions allow low weight, yet enough stiffness and support to get the benefits of Rolf technology with the spokes slightly spread apart. The slight distance between spokes in Rolf ATB wheels is there so you can use a spoke wrench on them. This way, if a rider crashes in the backcountry, with a little luck and skill they can rework the wheel and ride home. The box section rim also allows the use of standard valve stem lengths.

Vector Pro

765 g front, 995 g rear 14° front/16° rear

Vector Pro wheels are among the fastest available- only 132 grams total aerodynamic drag at 30MPH.

The spokes are bladed 13 gauge so are much stronger than conventional spokes. Vector Pros use special self-locking alloy nipples for low weight and resistance to unthreading. Rolf nipples require a 3/16" nut driver or socket-type spoke wrench which will fit through the access holes in the rim.

Vector Pro tension:

Front- 80-95 kgf, 15kgf maximum range

Rear, Drive side- 155-190 kgf, 30kgf maximum range

Non-drive side- sufficient to center or dish the rim

Vector Comp

18° front/20° rear 790 g front, 1077 g rear

Vector Comp tension:

Front- 80-125 kgf, 40kgf maximum range

Rear, Drive side- 115-145 kgf, 30kgf maximum range

Non-drive side- sufficient to center or dish the rim

Vector

20° front/24° rear 786 g front, 1070 g rear

Vector tension:

Front- 65-125 kgf, 30kgf maximum range

Rear, Drive side- 80-135 kgf, 30kgf maximum range

Non-drive side- sufficient to center or dish the rim

Propel XC

20° front/24° rear 642 g front, 894g rear

Propel XC tension:

Front- 91-135 kgf, 25kgf maximum range

Rear, Drive side- 68-135 kgf, 40kgf maximum range

Non-drive side- sufficient to center or dish the rim

Dolomite

666 g front, 987g rear 20° front/24° rear

Dolomite tension:

Front- 64-115 kgf, 35kgf maximum range

Rear, Drive side- 68-134 kgf, 40kgf maximum range

Non-drive side- sufficient to center or dish the rim

Dolomite Disc

716 g front, 1022 g rear 20° front/24° rear

Tangential lacing on the front wheel to handle the torque induced by a disc brake. The rims are maximized for the application, without braking flats. This allows the lightest rim possible with the strongest shape for the weight.

Dolomite Disc tension:

Front- 68-135 kgf, 40kgf maximum range

Rear, Drive side- 68-135 kgf, 40kgf maximum range

Non-drive side- sufficient to center or dish the rim

Suspension Primer

What is the best suspension?

Which car has the best suspension; Cadillac, Porsche, or Jeep?

The correct answer is: It depends on how and where you drive, and the 'feel' you like.

Bike suspension is no different. Some riders want the comfort of a Cadillac to keep bumps at bay at relatively low speeds. Others scream on singletrack like it was the autobahn, and they need the crisp control of a Porsche. And for huge rocks and ruts, the sure-footed traction and high ground clearance of a Jeep may be what's required to keep the rubber side down.

Many riders assume that a bike with lots of comfort and suspension movement is doing a good job. Using our car examples, that would make the Cadillac the suspension of choice. But take that marshmallow through some tight, high speed turns and you'd appreciate the shorter travel Porsche suspension and the way its stiff springs keeps all the wheels gripping. Now take the Porsche off road and see what happens. Sure, the Jeep may have a high center of gravity, but it comes in handy when rolling over big drops. At different speeds and through different terrain with different sized riders, suspension has to do different things. And not all riders sit on their bike the same, or like the same bike 'feel'.

Probably the biggest problem with understanding suspension is that riding a bike is dynamic. Things are in motion and changing, and changing fast, all the time. Not only does the terrain change, but the position of the rider on the bike changes. So does attitude of the bike. If the rider's weight is on the pedals, the bike will do different things than if the rider is seated. Pedaling hard creates different forces than coasting. The suspension reacts differently if its somewhat compressed already. This situation can make it hard to tell what the bike is doing, even when you're the one riding it. Its even harder to understand if you only look at a picture or read a magazine article.

Why are bicycle and motor vehicle suspensions different?

Its apparent that on average, a car or motorcycle travels at much faster speeds than a bike. But the bigger difference is the relationship of vehicle weight to motor weight. The motor is a small part of the overall weight or a car, it runs at very high RPMs, and its bolted securely to the frame through high frequency dampers. On a bike the motor is the rider, so the motor is most of the weight and is moving up and down a lot. The rider's motion provides large, low frequency pulses of torque at RPMs that easily activate the suspension.

The challenge of bicycle suspension

One of the biggest challenges in making good bike suspension is isolating the motor while allowing the suspension to be as reactive as possible to terrain. If the suspension does not react well to terrain, it isn't doing its job. If the rider is not isolated from the suspension, the suspension will react to pedaling creating a bouncing motion called "bobbing".

Bobbing causes lost energy

Bobbing can rob the rider's power through energy transfer to the shocks, or by interrupting the rider's pedaling rhythm. If a bike is bouncing up and down, its not only hard to put power to the pedals smoothly, its just plain annoying. In extreme cases bobbing can even work to lessen traction on a climb, and spinning the wheels really eats up power.

How shocks can eat up energy

Shocks are comprised of two parts; the damper and the spring. Since the damper is designed to dissipate energy, any activation of the shock by the rider's pedaling motion (bobbing) is wasting energy. This energy loss is easy to measure (see Engineering Sidebar).

The suspension spring also drains the riders energy, converting it to heat. To illustrate this, some exercise machines employ springs instead of weights. From this example its easy to see that it takes work to deflect a spring and then relax it. This work is being done by the cyclist. Like the exercise machines, the bike does not convert energy and get hot. But the person pushing on the springs does.

Engineering Sidebar

The damper, which resists motion by friction or viscous action will dissipate the rider's pedaling energy as heat. The amount of energy lost per stroke through the damper is a function of how much resistance the damper provides times how far it moves. This is the simple integral F x d where F is the resistance force the damper provides as a function of the deflection, and d is the distance it moves. If the damping force is really high, then the damper will barely move during the rider stroke (not much suspension), and the total energy lost will be small. If the damping force is almost zero, then the motion may be large (very bouncy), but the energy lost will be small again. The most energy will be dissipated per pedal stroke with a medium amount of resistance with a medium amount of travel.

Lost energy from spring action is not as measurable. When the cyclist exerts force on the bike, he or she deflects the structure and any suspension spring. The bike structure and suspension spring in most cases store the energy as mechanical work and do not dissipate it as heat, although some types of springs such as elastomer and air springs have significant hysteresis which do dissipate some heat.

The formula for the amount of energy stored in the structure or spring is the same as for damping, the integral F x d. F is the spring force developed as the spring is deflected, and d is the amount of deflection. As we do not want to reduce the pedaling force of the cyclist, the only way to minimize the energy lost in this equation is to make the bicycle frame structure very stiff, and reduce pedal induced suspension action (bobbing) in order to minimize the total deflection.

Suspension saves the rider's energy

When a bike hits bumps without suspension, the

rider must absorb the energy of impact. That's done with muscles. When those muscles work, they build up heat and they fatigue, just like when pushing springs. Sometimes they can't adequately handle the forces incurred and the rider loses control.

To compensate for the abuse of off road riding, suspension allows the wheels to deflect upwards. This diminishes the force felt by the rider, saving their energy and keeping them in control. Good suspension allows a bike to roll over bumps without losing as much speed as a non-suspended bike, so the rider saves energy because they do not have to pedal as much to maintain momentum.

Equal and opposite forces

Good suspension reacts to even the smallest bump, allowing the wheels to move up and over without disturbing the rider. But if a given force can move the wheels up, an equal and opposite force will move the frame down.

If a rider shifts his weight up and down on a bike without the brakes applied, and the suspension is supple and high quality, it will respond significantly to the riders movements. This is what it is designed to respond to, as in landing a jump or hitting an obstacle. If the rider keeps his/her body level and pedals with a smooth stroke, the bobbing or diving action of the suspension can be controlled and almost eliminated with a carefully designed suspension system.

But if the rider shifts his/her weight up and down while pedaling, movement of the suspension cannot be eliminated as this is what the suspension is designed to react to. The only way around this is to turn off the suspension to some degree, or find a counter-balancing force to the rider's up and down motion.

Isolating the motor from the suspension

There are several ways to isolate the rider from the suspension. The degree to which these designs are effective, or noticeable to the rider, depends on the particular design. Its even possible to combine more than one of these techniques in a single bike. The key to bicycle suspension performance is to isolate the rider so that they do not notice pedaling induced movement, yet the suspension is still as effective as possible. Since different riders pedal differently, and feel different things, there will always be varying opinions on which suspension design offers the best performance.

Types of Suspension

Unified Rear Triangle-

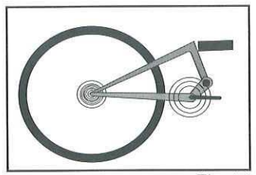


Fig. 14

The basic design of a URT puts a pivot between the rear triangle and the front triangle, with the bottom bracket being part of the rear. Some newer variations of the URT may be better termed 'Floating Drivetrains' since they don't include an entire triangle, but the bottom bracket and rear axle are still fixed with no pivots between them. Whether a Floating Drivetrain or URT, the rigid connection of the drivetrain prevents chain tension from causing the suspension to react or slow down.

By separating the chain forces from the suspension system, the chain tension does not pull or push on the suspension in any way. In addition, the high chain loads are not being put through any of the suspension bearings, lessening wear and flex.

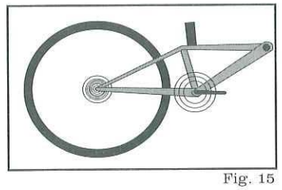


Fig. 15

While all URTs provide these benefits, the pivot placement makes a great deal of difference in performance. Some variants place the pivot so far forward (Fig. 15) as to cause the rider to be unsprung when they apply pedal pressure, whether its by pedaling hard or standing. The rider is literally standing on the swingarm and holding the rear wheel down.

Pros: Chain tension does not compress or extend the shock in any gear

Wide variety of axle paths available, according to pivot placement

Lightweight

Single pivot for low maintenance and lateral rigidity

Cons: To varying degrees according to pivot placement, rider weight is placed on the swingarm

To varying degrees according to pivot placement, bottom bracket moves relative to the saddle.

Simple swingarm-

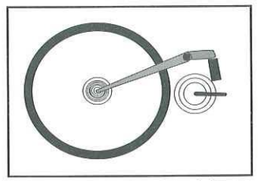


Fig. 16

With this design, the bottom bracket is located on a different frame member than the rear axle, but there is only one pivot between them.

With this design chain tension comes into play, pulling the swingarm either up or down depending on the pivot location and the gear combination If the pivot lies above the upper chain run, pedaling will resist shock compression and accelerate rebound. If the pivot lies below the chain run, pedaling will compress the shock and resist rebound. Only when the pivot is in line with the chain is the suspension approximately balanced with respect to the chain forces. This does not mean it is necessarily balanced to the remainder of the pedaling forces, like from the rider jumping hard on the pedals. Some riders feel that as chain tension pulls the rear tire downward, as when the pivot is slightly above the chain line, it enhances traction to provide an advantage when climbing.

Pros: Wide variety of axle paths available, according to pivot placement

Lightweight

Single pivot for low maintenance and lateral rigidity

Cons: To varying degrees according to pivot placement and gear selection, chain tension extends or compresses suspension

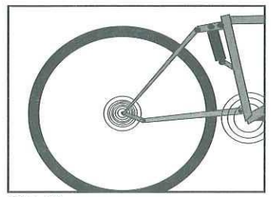


Fig. 17

Low/Forward BB Linkage-

Linkage systems have a link, or additional pivot, between the main pivot and the rear axle. With the low/forward pivot placement, this extra articulation means that virtually every gear is affected by chain tension. This does two things; in low gears it slows suspension movement and helps prevent bobbing. In high gears chain tension compresses the rear shock, making the suspension feel livelier. The linkage also changes axle path, although only be a small fraction. More importantly, with this low pivot placement, the axle path is slightly forward.

Pros: Very reactive suspension

Cons: Multiple small pivots wear easily, cause noise, flex

Chain tension either compresses or extends suspension depending on gear selection

Pivot location is limited.

Pivot is in tight area between tire and chainrings so must be narrow. Also in bad mud area.

Difficult to manufacture because there are many frame parts which require alignment, which adds cost if done right, or makes pivots noisy and wear prematurely if done wrong.

All pivot points are stress risers, so frame requires much reinforcement, making it heavy

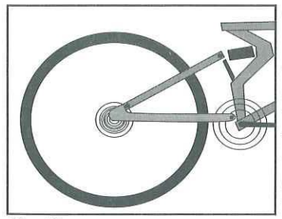


Fig. 18

Variations and Hybrids

There are many variations of these three designs, and there are a few designs which don't fit these definitions. But most are just that; variations. As an example, if a pivot is placed above the rear dropout on a simple swingarm, it may look deceptively like an entirely new linkage system. It may allow the design some additional benefits, but the rear wheel action will be that of a simple swingarm. Likewise, the shape of the swingarm, whether a beam or a triangle, does not change the way the rear wheel moves or the relationship of chain tension to suspension action.

In addition to these basic themes, additional features can be added. With each of these three categories, additional linkages can be added to allow modification of shock compression ratios. Different shocks with different spring curves and damping rates will change how the suspension reacts. Pivots can be moved around, forward or rearward, up or down, all with slightly different results.

Some variant designs even forego pivots, allowing the frame itself to flex. This may seem like a solution to pivot bearing maintenance. The problem is that a well designed pivot system can control torsional force and chain compression quite nicely, where the simple leaf spring created by a pair of flexing chainstays does not. With the limited travel of these systems, a suspension seatpost is a much more cost effective approach.

Some new designs have appeared which attempt to blend the advantages of different systems. From what we've seen so far, these hybrids usually take on unwanted complexity while losing the primary advantages of both the systems they are attempting to merge. As an example, one new system claims its major feature is eliminating the seat-to-pedal height change of a Y bike (which amounts to about 1/4") but in the process adds several pounds to the Y bike weight. At the same time it allows the distance from the bottom bracket to rear axle to change, losing the benefits of an URT.

Suspension bike design issues

But there are a few things that every designer has to keep in mind. The more pieces, the greater the weight, flex, & play. The more complexity, the more need for maintenance. Given similar technology, the smaller the bearing surfaces, the faster the wear. Adding lots of parts to the frame increases its cost, complexity, and replacement part problems. The narrower the separation of the bearing surfaces, the less lateral rigidity. And the more of these problems your design exhibits, the tighter quality control must be. With higher quality demands, higher costs are inevitable, or the greater the problems which will plague the rider.

A bicycle is both very simple, yet highly complex. Adding suspension into the limited space of a bike creates many challenges. With some designs, the suspension precludes building reasonable size ranges. Several current designs allow the front derailleur to move relative to the crankset (closer and further away), a real problem with sensitive 9 speed shift system.

Performance trade-offs

Each of these designs has its benefits, depending on what the rider considers the best trade-off in performance. Do they want the lightest bike possible? Or do they want the most travel? Or the plushest feel over small bumps? The lowest maintenance? Each of these features have their importance. But regardless of other design features, if a suspension bike is to be ridden up hill, it should be light and has to avoid bobbing.

The easiest and most effective method of preventing bobbing is to completely lock out the suspension with a shock lockout, where flipping a lever keeps the shock from moving. This is true lockout, where the suspension is turned off.

Some URT designs create a lockout effect, not a true lockout but a slight interference of the suspension action. This is done by moving a portion of the rider's mass from sprung to unsprung weight as they stand. The rider's weight

or pedaling movement doesn't effect the suspension as much because they are no longer suspended to the same degree.

Another way to avoid bobbing is with very stiff suspension from either springs or damping, or by limiting the travel. This results in less suspension travel in all conditions, and reduced suspension effectiveness. A bike maker may claim a model has 12 inches of suspension travel, but if the spring is from a 1 ton truck, you may only see 1/8 inch of travel in actual use. Alternatively, the damping may be set up relatively stiff at low speeds, so that suspension movement under pedaling is greatly reduced. Suspension response to small bumps will also be greatly reduced, and the suspension rebound may be too slow for the wheel to follow terrain and maintain traction.

A better strategy to avoid bobbing while still supplying some suspension is to use chain tension to counteract wheel movement. If the distance from the rear axle to the bottom bracket increases, chain tension can provide resistance to this movement. This technique is used on linkage systems and simple swingarm bikes where the pivot is above the upper chain run.

Bobbing is most noticeable when the RPMs are low and the rider moves their upper body a lot, such as climbing in a low gear. In first gear the bike is moving slow and bump forces are low, so with either of these designs the slowing of the suspension compression is mostly over the small amount of travel generated by hitting a bump at 4 MPH. However, if the pivot is below the upper chain run, chain tension from the rider's pedaling will compress the suspension and slow the suspension rebound. This is more likely to occur in higher gears at higher speeds.

A third method used to avoid bobbing is balancing torque. The harder a rider pedals, the more force goes downward which would normally create bobbing. But the harder they pedal, the more torque they generate at the rear wheel, and with careful pivot placement the equal and opposite force is lifting the frame. If these two forces can be balanced, bobbing will be minimized. This requires very careful pivot location and since riders sit on their bikes differently, and they rarely sit still, this method is much harder to execute successfully. The downside is that although chain tension is not locking out the suspension, the torque forces can override small bump forces.

Most methods of preventing bobbing rely on chain tension to interfere with the suspension movement. The interference is applied by your muscles as a form of damping. Rather than view this as a negative, think about the work done by your legs when you stand on a hardtail. Not only do your legs do the work of a spring, they also do all the damping. Plus they're working harder, because they have to hold you up as you stand. And since its difficult to pedal over rough terrain, your legs then have to do extra work to get you back up to speed.

Active vs. Inactive Suspension

An ongoing argument is that of Active vs. Inactive suspension. These terms are thrown around a great deal, but without any definition of exactly what they mean.

For our purposes here, lets just say that if a suspension is working without interference, its active. Since most systems rely on some interference to prevent bobbing, the term doesn't mean much.

Since it doesn't mean much, be more specific when describing suspension movement. Some suspension is more lively, or lightly damped. Others move slowly being heavily damped. But in either case it may be the result of suspension interference or could also be incorrect tuning.

Pivot location and axle path

A very important, but seldom discussed, area of suspension performance is that of axle path. The axle path is the actual movement of the wheel axle as the tire contacts a bump (Fig. 19). Since most systems really only have a single pivot, axle path is tied very closely to pivot location. Even on systems with a "virtual pivot" there is a main pivot from which a simple arc will very closely describe the axle path.

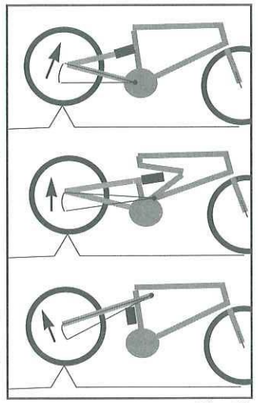


Fig. 19

The axle path of telescoping suspension forks is very easy to see. Its the fork legs. This seems very simple, but this axle path is actually very efficient. It allows the wheel to move backward slightly as it moves up. By the wheel moving backwards, the rider's mass can continue moving forwards as the wheel moves over the bump. The rider does not slow down as much, and the force at the handlebars is reduced. But if the axle path is anything other than vertical, the wheelbase will change when the suspension is compressed and that can affect handling.

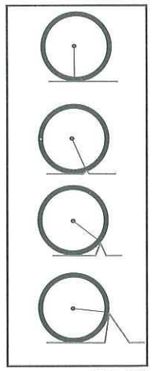


Fig. 20

Since the axle path of the front wheel is in line with the force path of the rider's mass, forks can feel very plush. However, this also means that any up-and-down motion from the rider will activate the fork. This limits the useful travel of forks on a bike which has to be pedaled uphill.

Its may seem logical that the characteristics which are desirable in the axle path of a front wheel would also apply to the rear wheel. This is largely true, but the dwell time, or length of time the suspension needs to react, may be shorter with a more forward axle path. One benefit of most of today's rear wheel axle paths is that they are not in line with the rider's up and down pedaling motion. Because of this, bikes can have additional rear wheel travel without adding a lot of bobbing.

If you trace the axle path of an URT or simple swingarm, the axle path is easy to see as a simple arc. The same analysis applies with a more complex linkage. Usually a single pivot will be able to provide a similar path with a lighter, stronger and more rigid structure.

Another component of axle path is angle of attack. The direction of force applied by a bump to the wheel depends on the size of the bump, or the height at which it contacts the wheel. Bump force has both magnitude and direction. A suspension system is at its most efficient, or sensitive, when the force is in line with the axle path (Fig. 20).

However, other suspension characteristics can easily override this factor. A suspension system with reduced mass and reduced static friction moving not directly in the direction of impact may be more sensitive than a heavier or stickier suspension moving directly away from the point of impact.

Moreover, it is difficult to optimize the direction of travel for all conditions as different size bumps will contact the wheel in different locations. And some suspension action is completely vertical, like when landing a jump.

So what's the best pivot location? There are several considerations. If you oversimplify and only want to consider shock absorption, pick a pivot point that gives the best axle path for the size of bump you want to absorb most often. But since there are many forces applied to the bike and suspension, pivot point selection is not as simple as it may seem. Every location will be some sort of compromise as suspension function, component interface (like how it affects derailleur placement and adjustment), and overall geometry (like how small the bike can be made).

All about Springs

A spring is an energy storing device. As the suspension is compressed when the wheel rolls over a bump, the energy from the bump is momentarily stored in the spring. Then the spring pushes the wheel back down, returning most of the energy (but not all, see Damping).

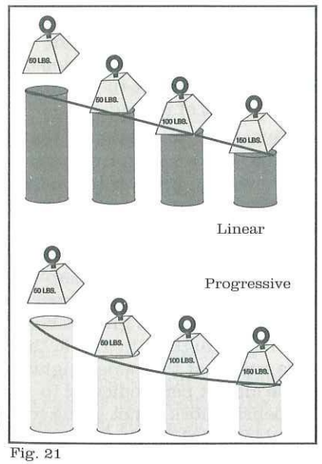


Fig. 21

The stiffness of a spring is called its Spring Rate. Usually this is expressed in pounds per inch of deflection. Another use of this term leading to confusion is that the change of its stiffness, which naturally occurs as the spring is compressed, is also called its Spring Rate. With the confusion surrounding these terms, its important to differentiate between Spring rate, Spring stiffness, Shock compression rate, and the overall System suspension rate during any discussion.

Here we will discuss springs. If each increment of compression requires the same force, the spring is said to have a Linear spring rate (Fig. 21). With a progressive spring, compression varies with each increment of force applied. So the first 50 pounds compresses the spring a different amount than the next 50 pounds, and so on, until the spring has virtually no compression left. The progressive type of spring allows the designer to make a suspension that is relatively supple and responsive to small bumps, but when a large bump or landing is encountered, the spring becomes much stiffer as it travels further into the stroke, still preventing bottom out.

Metal springs are generally linear. Coil springs can be made to be progressive, but its quite expensive. Elastomer and air springs are progressive by nature.

Since metal springs require lots of material, usually steel, they are quite heavy. In some cases the coil alone weighs more than an entire air spring shock. The gas and elastomer springs are also more efficient springs than the metal springs. That is, they can store more energy per mass than a metal spring can.

An elastomer is a type of plastic from a broad chemical family, so there are actually lots of types of elastomers with somewhat varying characteristics. They can also be made to different durometers (hardness, which also relates to stiffness). Some have tiny air bubbles (microcells) that further alter their performance. Elastomers are fairly low in weight. They offer a reasonably wide adjustment range, but different durometers are required to cover all the ranges required in a bike. After time, elastomers can become semi-permanently compressed so that for best performance they need to be replaced. The spring curve of an elastomer spring is determined by the ratio of elastomer length to percentage of compression and specific elastomer.

Air is the lightest spring and air never wears out. But the container it is in may make up for the light weight of the air, requiring a stout container and highly engineered seals to prevent the air from escaping, and the tight seals can induce stiction. Air springs are easy to adjust to virtually any stiffness by simply pumping up the air pressure.

Air or gas springs trap an amount of gas molecules in a chamber. The springs works by compressing the gas in the chamber. As the chamber becomes smaller and smaller, the force needed to compress the gas goes up exponentially. The ratio of air chamber size to percentage of compression will determine what the spring curve looks like.

It is also possible to incorporate a combination of different types of springs such as metal and elastomer, or air and metal, or air and elastomer into a single unit.

The rate debate

Another hot area of debate for suspension designs is Falling rate vs. Rising rate. Like Active vs Inactive, these

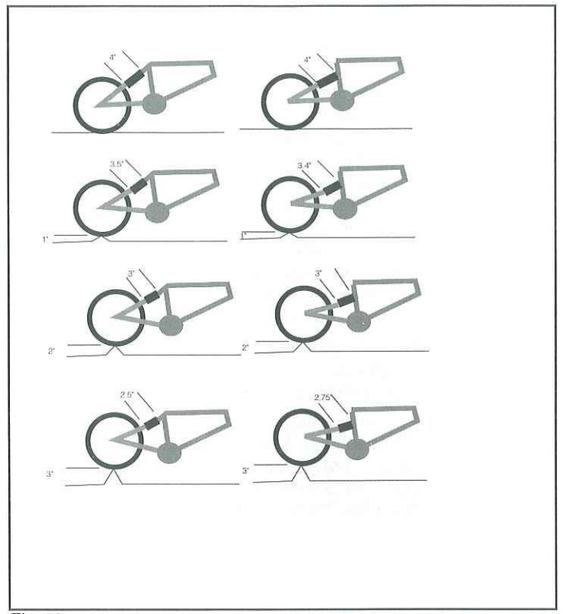


Fig. 22

are more terms being tossed around without anyone agreeing on what they mean. Is it the rate of compression of a shock unit with a constant rate of deflection of the rear wheel? Or is it the effective spring rate of the rear wheel (including the structure)?

A good suspension design blends spring rates, spring curves, wheel travel, damping, and shock compression ratios to achieve a certain feel and function. Since all of these factors play into how a suspension system works, its unrealistic and inaccurate to pull just one of the design parameters out and use it as a single standard for evaluation of a system.

Here's an example: If a system uses a falling (shock compression) rate, but with a shock which has a very progressive spring curve, the net effect could be a rising rate suspension when considering the whole structure. But if you were to substitute a linear coil spring shock, the situation would be very different, and the bike would ride very differently.

If a system is very plush on small bumps, it will need to rise (get stiffer) quickly to provide enough shock absorption over big bumps to avoid bottoming out. Conversely, a system with the same overall capacity that is not very plush can offer more travel over big bumps. And by adding shock linkages which change the shock compression rates there are an almost infinite number of choices between these two examples.

Which is better? It depends on how you ride.

Damping

As a shock is compressed, an amount of energy is changed to heat through friction (you don't lose energy, its only changed into different kinds of energy). This change in energy results in less energy being returned by the spring, thus slowing the springs rebound down. This effect, whether great or small, is called damping. In a highly engineered system, damping is matched to the spring to yield higher quality suspension action.

Depending on the design, damping can also come from bushing friction or seal friction, all adding to the damping. With an elastomer shock, the damping friction may simply be from elastomer molecules bumping into one another plus the elastomer rubbing on the inside of the shock, an effect called hysteresis.

With hydraulic damping, a fluid is forced through tiny holes called valves as the shock is compressed or rebounds. The fluids commonly used are either oil or air. Either one can be designed and built to function well. The oil unit needs to have high quality construction, surfaces and seals in order to not leak or wear in service. The air damper is not as likely to oil your floor for you, but it also needs to have the same level of construction, surfaces, and seals to not leak the gas working fluid and provide high quality damping.

Damping valves are designed to provide varying resistance to fluid flow, depending on the pressure exerted on the shock. With careful tuning of sophisticated designs, a suspension system can be made so that it resists low forces, like those from a rider pedaling. Yet the same valves can allow the shock to move very fast when a big bump is encountered. Since hydraulic damping is engineered, there is a great deal of variation possible, with great control. For this reason, hydraulic damping is used where more sophisticated shocks are required. Fortunately, bicycles are fairly simple machines and the expense of hydraulic damping isn't always required.

The importance of travel

The amount of impact energy is determined by its magnitude and direction. The trail factors which determine direction and magnitude are the size of the bump, the speed of the rider, and the weight of the rider.

To keep from bottoming out, the combination of the spring and damper must be able to store and/or dissipate the highest amount of impact energy a given rider deals with. The amount of travel offered by a suspension system is the most important factor in providing higher levels of shock absorption.

Direction is described by the line from the contact point on the tire to the axle. If this line does not follow the axle path, the suspension system will not give its best results. As an example, if you run straight into a wall, the contact point on the front tire will be at the same height as the axle, and the line will be almost perpendicular to the axle. In this case, the suspension fork is not going to help the rider much. If the contact point on the tire is in line with the lower fork leg (with a 71° head angle and 40mm offset, about 1" tall after some tire compression) the suspension fork will work at its best. Different axle paths work differently, and as bump size varies so does the efficiency of a given suspension system.

Magnitude is the amount of impact energy generated by hitting a bump, described by the speed of the axle. All other factors being equal, higher magnitudes result from greater wheel travel, shorter time elapse of the shock compression, or both. At a given speed bigger bumps force more wheel travel. Sharper bumps, as opposed to rollers or whoop-de-doos, make the wheel travel happen over a shorter time period (as well as changing the direction). And as the rider speed increases, the time the wheel takes to move over a bump decreases.

Most of the bump energy is typically stored in the spring on compression. To avoid bottoming out the suspension over a bump, the suspension must have a sufficient combination of spring rate and suspension stroke to store this energy in the spring. There are two ways to make a suspension system store more energy; make the spring stiffer, or make it with more travel. The downside of a stiffer spring is that to preclude bottoming out, the spring may have to be so stiff that the suspension does not do an adequate job of isolating the rider on smaller bumps and keeping the rear wheel hooked up with the ground. The downside of a longer stroke (more travel) is that if the suspension is not balanced with respect to the rider's pedaling forces, additional travel may allow more of the riders energy to go into pedaling induced suspension movement.

Engineering Sidebar

For a linear spring, the integral F x d where the force F(x) 3D Kx results in BD Kx^2. Increasing the spring rate will increase the energy stored. However, increasing the stroke of the suspension has a squared effect on increasing the energy stored. So longer stroke is more effective to prevent bottoming out than a stiffer spring.

Matching rider to bike

Most suspension systems offer some features which are good. Your job is to determine what the good points of a bike are, and how a given rider would benefit from them.

From this discussion, it should be evident that there are many factors which effect how a suspension bike works. To only consider one design issue when choosing a bike would be a gross over-simplification. But if you understand suspension at all, you also see that every bike makes some compromises. The secret in matching a suspension bike to a customer is finding the design which makes sacrifices your customer can overlook, but also gives them the benefits they need for their type of riding.

Adjusting the suspension

Any suspension bike will ride better if its tuned to the rider. First, position the rider to their tastes while monitoring suspension sag. The suspension is not really tuned here, but the attitude of the bike must be consistent with how it will be ridden. If the rider is positioned with the rear suspension set up too soft and then you crank up the spring preload, the angle of the saddle and position over the bottom bracket can change drastically. Conversely, sliding the saddle back a mere centimeter can greatly increase the sag.

Once the rider is positioned on the bike, its time to tune the suspension. The key to proper preload adjustment is sag, or shock compression (of both the forks and the rear shock) by only the rider's weight on the bike. Again, their position on the bike is critical to weight distribution, so they should sit in a normal riding position.

As an example, with long forks and riser bars a rider ends up sitting fairly upright. This position puts a higher proportion of weight on the rear shock, which will need more preload than the rider in a classic racing position.

Shock manufacturers may have their recommendations, and the suspension designers will have theirs. Look at both, but also tune to the rider's preferences.

Generally you want more sag on shocks which have more travel. Something like 25% of the shocks total travel should be used in sag, although a cross country racer wanting a Porsche ride may want less than this, and a Cadillac cruiser may want more. Fox recommends 25%, others as much as 33%.

The suspension system can make a difference. A rider with a very smooth pedaling style can ride with less preload without bobbing. If the bike design provides lockout the amount of preload becomes less important, especially if its a shock lockout. If a rider is not accustomed to the motion of a full suspension bike, higher preload (and less sag) will help quiet any small amount of bobbing.

Once the correct sag is established, consider damping. If the suspension has damping adjustment, start with the damping set at minimum. The bike may be a bit of a handful to control. Increase the damping until the bike rides right, without loss of control in extreme conditions. You do not need more damping than is required for control of the bike. Excessive damping adversely affects pedaling efficiency and traction. On some bikes the rebound damping is so firm that after you compress the bike and release it, the saddle comes back up slowly. This high damping cannot keep the rear wheel on the ground and will pack down in a rough section. It will run out of suspension function when you need it most because the rear wheel never achieves the rebound stroke.

Good damping needs to be matched to the spring rate. We work closely with our rear shock suppliers, setting the damping to match both the spring rates of our bikes, and also the overall suspension design. If you change the spring on a shock, consider how this will interact with the damping.

With a 600# spring on the shock from a Large VRX which has damping for a 1050# spring, the shock may be too damp for optimum performance. Work with the rider to ensure that the bike rides the best possible for them.

VRX

Several years ago Trek made a large financial commitment to the future by establishing an off-site R&D facility. While most of our 60 engineers are caught up in the daily business of designing production bikes or running a factory, the folks working at the R&D lab have the luxury of just dreaming up bikes and making prototypes.

Much of their work has been supporting Trek racing teams; Time Trial bikes for the USPS team, Prototype cross country geometries, and the many revisions of downhill bikes for the NORBA Pro circuit. While it may seem like a lot of cost and effort for just a few racers, the best of the ideas inspired by these efforts get passed along to the general public.

A great example is the new Trek VRX full suspension cross country bike. The inspiration for this design came from the full-on downhill machines built for Trek downhill ace Scott Sharples (winner of the 1999 Mammoth Mountain NORBA Downhill). By adapting the race-proven concepts of Scott's downhill bike to cross-country riding, the R&D lab has made a bike that is light enough, and with the right amount of travel to be used for all-round cross country riding. Like Scott's downhill machine, the new VRX is super strong, extremely stiff laterally, yet it offers a level of suspension much more sophisticated than other systems.

The VRX is built on Trek's Pro geometry, which means it has the handling and manners needed for higher speed riding. It corners like its on rails, and is very stable on the steep stuff. The VRX has about 4" of travel, which puts it into the long-travel category for extreme terrain. But don't let the low weight fool you; with Alpha aluminum construction its tough enough to take some hard riding.

The key to this new level of suspension performance isn't tied to one particular feature. The new Trek VRX is a blending of the best design details:

- Variable Rate Suspension (VRX)
- Fully Independent Linkage (FIL)
- Single pivot swingarm
- Trek pivot technology
- Long travel rear end
- Alpha frame technology

FIL (Fully Independent Linkage)

The VRX is adjustable by choosing one of three shock mount locations on the F.I.L. linkage (Fig. 23). Moving one position will change the suspension performance (and rear wheel travel) by about 10%. XC is for rider's who climb a lot, AC is for All Conditions, and DH adds more plush for downhilling. Its easy to move the shock so you can change during the ride in about a minute.

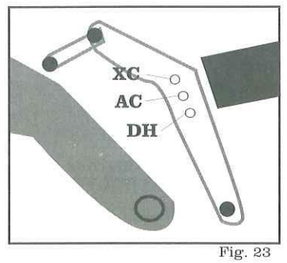


Fig. 23

Many bike suspensions use the rear shock as a structural member, where bending loads applied to the shock reduce its smooth action. In addition to interfering with good suspension action, this creates extra seal wear which shortens the life of the shock, an expensive piece of hardware.

On the VRX, the shock is isolated from the bending and torsional loads that every bike goes through- they're all carried through the Trek pivot. Our tests show the shock can be removed from the VRX without effecting frame stiffness and rear wheel control.

Not only does the FIL protect the shock, the design also isolates the linkage pivots. Even so, we didn't cut corners. All hardware is Spiralock or Nylock inserts that don't loosen. And the pivot bushings are Teflon impregnated composite so no lubrication is required.

VRX

Most bikes use a simple shock actuation where the chainstay works like a lever against the pivot to apply another lever against the shock (Fig. 24). The ratio between A, the distance from the pivot to the rear shock mount, and B, the distance from pivot to the rear axle, determines how stiff the shock needs to be to avoid bottom out, but this also limits how soft the suspension can be.

On simpler systems, this ratio remains constant throughout the suspension movement. The leverage ratio of a Y bike is 3.0, where the distance from the pivot to the rear wheel axle is 3 times the distance from the pivot to the rear shock.

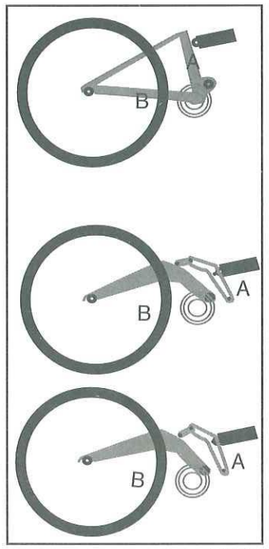


Fig. 24

With the VRX design, the shock compression ratio changes as the suspension moves because distance A changes (Fig. 24). The initial leverage ratios of the VRX in each of the settings on the FIL are 3.1/1, 3.4/1, and 3.72/1. As the suspension is compressed, these each go up. This means the VRX suspension can be set up so that it swallows small bumps for incredible traction and comfort. At the same time it can handle big bumps without bottoming. Most bikes can do one of these functions, but not both at the same time.

Single pivot swingarm

The VRX uses a single swingarm for the best possible rear end control. The massive cantilever design keeps the rear wheel in line, so the VRX carves turns perfectly. And the rear axle path is optimized for the 4 inches of travel.

In the past, single pivots have been limited because the simple leverage ratios employed by these systems allowed chain tension to interfere with a rider's pedaling in some gears. This is eliminated on the VRX by combining a carefully placed pivot with the Variable Rate shock actuation.

The lateral and torsional stiffness of a pivot is directly related to its width across the load; much like the way the spokes in a wheel support a rim. Imagine how flexy a wheel would be if the hub flanges were only a few millimeters apart. As the supports are spread out, they can better resist loads which would displace them sideways. Another benefit is that if the pivot is stiffer, it will see less wear. In designs where a linkage controls the rear wheel the small, narrow pivots will individually see the same loads applied to the single pivot of the VRX. And imagine what happens if the bearing surfaces in all those linkage members aren't perfectly aligned!

Trek pivot technology

The VRX uses pivot technology proven on the Y bikes. The difference is that the bearings are more widely spaced with increased bearing surface. The extra width increases the frame's lateral and torsional stiffness. The increased bearing surface means the pivot will last even longer. As the Y bikes have proven, this is an excellent system for bicycle suspension requiring zero maintenance, yet with loads of features:

- Frelon surface material is self-lubricating
- Load capacity is four times higher than ball bearings
- Longer life due to significantly increased contact area
- Shock loads are absorbed without damaging bearings or components
- Damps vibration for quite and smooth operation
- Reliable friction characteristics that do not increase over the life of the bearing
- Close fit and wipe action means bearings are completely sealed

Compared to ball bearing systems, there are several ounces of breakaway necessary to actuate the pivot. You can feel this resistance if you remove the shock from the bike and move the swingarm (although the swingarm action becomes much freer after the first hundred miles). But compared to the hundreds of pounds of force necessary to begin compression of the shock, the difference in breakaway force between ball bearing pivots and the Trek pivot is insignificant.

A much more important issue with a suspension bike pivot is that of wear and maintenance. The Trek pivot uses a pressure/dirt guard that was specifically designed into the system to address the weakest area of ball, roller or needle bearings: contamination. Instead of spending time and money servicing pivots, most riders would rather ride their bikes.

Long travel rear end

All 4 models of VRX use the same 6.5" shock, with the same 1.25" stroke, so they all have the same rear travel. In the 3 shock mount positions of the FIL, the VRX offers 3.75, 4.0, and 4.25" of rear wheel travel. But its really the quality of travel, the overall feel of the suspension, that wins hearts. Its super plush over small stuff, and totally hooks up on anything, up or down. Yet landing jumps is super smooth with no bottom out. Rebound is totally controlled, and will never surprise you with a slap on the backside after landing. And even though the VRX is a long travel design, it has excellent climbing manners, even out of the saddle.

Alpha frame technology

The VRX uses 6061 T6 aluminum for durability and high yield strength. It offers lots of detailed forgings which are both pretty, and extra strong. Another source of strength is the butterfly style downtube gusset which offers high frontal strength.

Other frame details include:

- 4th cable guide for remote lockout if desired
- 31.6mm seatpost is very stiff for control
- Hayes disc brake mount on chainstay
- High swingarm clearance allows easy front derailleur adjustment, even with 46t XTR chainrings
- Replaceable derailleur hanger
- Bottle mount under downtube, behind seat post
- Frame weight is just 5.4 pounds

Fitting the VRX

Because the VRX is designed to be ridden with sag (and the rear will sag more than the front), make sure you account for this when setting up the saddle. The distance from the bottom bracket to the saddle does not change, but the bottom bracket will move towards the ground and the saddle will end up at a different angle than when unweighted.

We like to set the bike up with the saddle slightly forward and nose tilted down. Then when you sit on the bike, the saddle moves back and the rear of the saddle drops slightly. Presto- the saddle is right where it should be.

How much sag? The correct sag should be between 15 and 25% of total shock stroke, meaning the bottom bracket should drop about 1/2".

VRX Geometry

Frame size	S	M	L
Head angle	71.0	71.0	71.0
Seat angle	74.4	73.4	72.3
MM			
Standover	686	697	721
Seat tube	381	457	533
Head tube	125	125	145
Eff. top tube	560	600	640
Chainstay	421	421	421
BB height	306	306	306
Fork offset	42	42	42
Trail	71	71	71
Wheelbase	1051	1081	1110
INCH			
Standover	27.0	27.4	28.4
Seat tube	15.0	18.0	21.0
Head tube	4.9	4.9	5.7
Eff. top tube	22.0	23.6	25.2
Chainstay	16.6	16.6	16.6
BB height	12.0	12.0	12.0
Fork offset	1.7	1.7	1.7
Trail	2.8	2.8	2.8
Wheelbase	41.4	42.6	43.7

Mechanic's Specs and Notes

Seatpost diameter	31.6mm
Seatclamp diameter	36.4mm
Headset size	25.4/34.0/30.0
Fork length	443mm
Front derailleur	Direct E-type (only) Down pull
Bottom bracket	73mm, E-type
Shock length	6.5"
Shock eye width	7/8" top and bottom
Shock eye ID	6mm
Shock stroke	1.25"
Rear wheel travel	3.75, 4.0, 4.25"
Rear hub OLD	135mm
Cable stops	4 cables
Disc brake mount	Hayes type
Bottle mounts	1 frame, 1 seatpost
Rack mounts	No

VRX Parts list

Pivot axle set	69541
FIL bolt set	69539
Bearing set	69540
Small link	69542
Bottom bracket cable guide	963350
Replaceable derailleur hanger	980116
Hayes hydraulic line guide set	67297

Intensity: Pro
Surface types: Extreme or abusive dirt
Topography: Mountainous
Distance: Long distance
Spec level: Professional

VRX 500

Our Price $_____

Frameset	6061 T6 aluminum
Main tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox SID XL, 100mm
Rear shock	Fox Vanilla R coilover, adjustable rebound
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Diesel, 9° bend, 30mm rise
Stem	ICON Durante, direct connect
Bar ends	-
Grips	Bontrager Ergo
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano XTR
Front brake	Hayes Disc, full hydraulic
Rear brake	Hayes Disc, full hydraulic
Brake levers	Hayes hydraulic
Crankset	ICON Tork, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52E, 73 x 113
Pedals	Shimano SPD M545, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 length, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 24° 2x, 261/263 Rear 24° 2x, 261/260 (D/ND)
Saddle	Bontrager FS Race, Cro-Moly rails
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Dolomite Disk
Front Hub	Rolf
Rear Hub	Rolf
Front tire	Bontrager Jones, folding, 49/53
Rear tire	Bontrager Jones, folding, 46/50
Spokes	DT 14/15G butted stainless
Tubes	Presta valve, ultra light

- VRX suspension- variable rate makes it super plush on small stuff, progressive on big hits
- Rolf Dolomite Disk wheels- low maintenance, weight and strength maximized for disc brakes
- RockShox SID XL, 100mm travel- SID design, double crown for steering control
- Fox Vanilla R- plush coil with adjustable rebound damping
- Hayes disk brakes- best stoppers available
- Shimano XTR rear derailleur- superfast shifting
- Shimano 545 pedals- SPD action with platform for support
- ICON Diesel riser bars- wide for control on technical downhills
- ICON Tork cranks- strong and light, fast shifting, long wearing 9 speed rings
- Bontrager FS Race saddle- extra comfort

Additionals 2 water bottle mounts

Colors Dragonfly Orange/ Red fork • Black decal

		S	M	L
Bike sizes		S	M	L
Bar width/rise		620/30	620/30	620/30
Stem length		90/7°	105/7°	120/7°
Crank length		170	175	180
Seatpost length		270	350	350
Steerer length		218	218	238
Rear shock spring		700	800	1050
MM	**Reach**	641	694	748
Handlebar height		865	877	907
IN	**Reach**	25.2	27.3	29.4
Handlebar height		34.1	34.5	35.7

VRX 400

Our Price $_____

Intensity: Pro
Surface types: Extreme or abusive dirt
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	6061 T6 aluminum
Main Tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	Manitou X-Vert-T, 100mm
Rear shock	Fox Vanilla coilover
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Diesel, 9° bend, 30mm rise
Stem	ICON Durante, direct connect
Bar ends	-
Grips	Bontrager Ergo
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano Deore XT SGS
Front brake	Hayes Disc, cable actuated
Rear brake	Avid Single Digit 10, direct pull
Brake levers	Avid AD-1.0 L, long pull
Crankset	ICON Flywheel, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52E, 73 x 113
Pedals	Shimano SPD M545, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 length, 3/32"
Rim strips	Velox 19mm
Spoke lengths	Front 32° 3x, 264/262 Rear 32° 3x, 264/262 (D/ND)
Saddle	Bontrager FS+10 Comp
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Maverick ASYM
Rear Rim	Bontrager Maverick ASYM
Front hub	Formula disc
Rear hub	Formula disc
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve

- VRX suspension- variable rate makes it super plush on small stuff, progressive on big hits
- Manitou X-Vert-T, 100mm travel- double crown for strength, TPC for control
- Bontrager Jones tires- full knobs for all-round traction
- Hayes front disc brake- super stopping power
- Fox Vanilla - plush coil ride
- Shimano XT rear derailleur- superfast shifting
- Shimano 545 pedals- SPD with platform for support
- ICON Diesel riser bars- wide for control on technical downhills
- ICON Flywheel cranks- strong and light, fast shifting, long wearing 9 speed rings
- Bontrager FS Comp saddle- extra comfort, even in climbing

Additionals	2 water bottle mounts
Colors	Black Gold/ Mango fork • Red decal

	S	M	L
Bike sizes			
Bar width/rise	620/30	620/30	620/30
Stem length	90/7°	105/7°	120/7°
Crank length	170	175	175
Seatpost length	270	350	350
Steerer length	219	219	239
Rear shock spring	700	800	1050
MM Reach	641	694	748
Handlebar height	860	871	897
IN Reach	25.2	27.3	29.4
Handlebar height	33.8	34.3	35.3

VRX 300

Our Price $_____

Intensity: Racing
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	6061 T6 aluminum
Main Tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox Judy XC, 80mm
Rear shock	Fox Vanilla R coilover, adjustable rebound
Headset	Dia-Compe ST Aheadset
Handlebars	ICON Diesel, 9° bend, 30mm rise
Stem	ICON Durante, direct connect
Bar ends	-
Grips	Bontrager Ergo
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano Deore XT SGS
Front brake	Avid Single Digit 20, direct pull
Rear brake	Avid Single Digit 20, direct pull
Brake levers	Avid SD-1.9 L, long pull
Crankset	ICON Crankshaft, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52E, 73 x 113
Pedals	Bontrager RE-1, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 106 length, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254 Rear 32° 3x, 264/265 (D/ND)
Saddle	Bontrager FS+10 Comp
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Maverick
Rear Rim	Bontrager Maverick ASYM
Front hub	Bontrager Comp II
Rear hub	Bontrager Comp II
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve, ultra light

- VRX suspension- variable rate makes it super plush on small stuff, progressive on big hits
- RockShox Judy XC, 80mm travel- 28.6mm stanchions for steering control
- Bontrager Jones tires- full knobs for all-round traction
- Fox Vanilla R- plush coil with adjustable rebound damping
- Shimano XT rear derailleur- superfast shifting
- Bontrager RE-1 pedals- float, excellent mud evacuation on SPD type cleats
- ICON Diesel riser bars- wide for control on technical downhills
- ICON Crankshaft cranks- strong and light, fast shifting, long wearing 9 speed rings
- Bontrager FS Comp saddle- extra comfort, even in climbing

Additionals	2 water bottle mounts
Colors	Dragonfly Green/ Yellow fork • Black decal

	S	M	L
Bike sizes			
Bar width/rise	620/30	620/30	620/30
Stem length	90/7°	105/7°	120/7°
Crank length	170	175	180
Seatpost length	270	350	350
Steerer length	206	206	226
Rear shock spring	700	800	1050
MM Reach	641	694	748
Handlebar height	854	865	896
IN Reach	25.2	27.3	29.4
Handlebar height	33.6	34.1	35.3

VRX 200

Our Price $_____

Intensity: Racing
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	6061 T6 aluminum
Main Tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox Jett XC, 75mm
Rear shock	Fox Vanilla coilover
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Diesel, 9° bend, 30mm rise
Stem	Forged alloy direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano STX-RC RapidFire+
Front derailleur	Shimano STX-RC
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LV77E direct pull
Crankset	Shimano Alivio 42/32/22
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	IG31, 106 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254 Rear 32° 3x, 264/265 (D/ND)
Saddle	Bontrager FS+10 Comp
Seatpost	ICON Moses, 6061 Al
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	Bontrager Comp I
Rear hub	Bontrager Comp II
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve, ultra light

- VRX suspension- variable rate makes it super plush on small stuff, progressive on big hits
- Bontrager Corvair/ASYM rims- welded to be light, less dish for strength, machined for smooth braking
- RockShox Jett XC, 80mm travel- long, plush travel
- Bontrager Jones tires- full knobs for all-round traction
- Fox Vanilla- plush, 4" travel
- Shimano Alivio crank- 22t low gear, smooth shifting
- ICON Diesel 2014 alloy riser bars- wide and strong for control on technical downhills
- Bontrager FS Comp saddle- extra comfort and technical shape

Additionals 2 water bottle mounts

Colors Metal Flake Blue/ Black fork • Black decal

Bike sizes	S	M	L
Bar width/rise	620/30	620/30	620/30
Stem length	90/25°	110/25°	130/25°
Crank length	170	175	175
Seatpost length	270	350	350
Steerer length	208	208	228
Rear shock spring	700	800	1050
MM Reach	625	679	734
Handlebar height	878	879	930
IN Reach	24.6	26.7	28.9
Handlebar height	34.6	35.3	36.6

Suspension Evolution

As full suspension bikes become more and more popular, they are being ridden in different ways. Different features and benefits become important according to the riding style, terrain, rider size, and speed of the rider (for more on this topic, see "Suspension Primer" on page 21).

As our Product Managers toured the country last year visiting dealers (about 250!), going to races and fat tire festivals, and just watching riders on the local trails, we were able to identify three distinct types of suspension rider.

• All-round Suspension rider. The largest group is the all-round rider. They ride their bikes mostly just to ride and have fun. They ride in a wide variety of terrain and conditions, and may even race in cross-country events occasionally. They need good all-round suspension, with an emphasis on comfort.

• Big Suspension rider. This group has some subsets. Some Big Suspension riders like to push their limits over gnarly terrain. Others are downhiller wanna-bes. And another sector of this group is chairlift riders. All these riders need long travel systems, lots of plush, and maybe extra brakes.

• Racer Suspension rider. This group rides the same terrain as the All-round Suspension rider, but prides themselves on how fast they can get up a hill. Some of them are even regulars at NORBA races. These riders don't want a ton of travel, they just want a little help in the technical stuff, and something to take the edge off the hard hits.

Pro Geometry

For the Racer Suspension rider, the Y SL is the machine. It has Pro Geometry, which means it has the handling and manners needed for higher speed riding. It corners like its on rails, and is very stable on the steep stuff. This is a bike that likes to be counter-steered, an advanced handling technique where the bike is leaned deeply into a turn while the rider keeps their body more upright. Like a skier, this keeps the body balanced and agile, and puts the edges into the turn- the edge knobs, where hard biting traction is at its cornering best. Pick a line and the Pro geometry will hold it. This is important, because the Racer Suspension rider is going too fast to change lines in a corner. They just pick the line early, and Pro geometry does the rest.

OCLV HC

Although the standard carbon Y bike was one of the lightest suspension framesets around, to earn the name SL this Y bike had to shed some pounds. Our engineers fulfilled that requirement with a new material called OCLV HC (see Frame Materials, page 6 for details on this patented material) so the main frame is now just 1.65 pounds.

Adding OCLV HC allowed us to really soup up the SL. Not only did we take out 100 grams of frame material, OCLV HC actually increased the strength and stiffness of the SL by 20%!

Unified Rear Triangle

In the past we have said that the Unified Rear Triangle design allowed the best efficiency between the cranks and the rear wheel because there is no pivot between the two. Therefore, chain tension (and the rider's energy) is never wasted by compressing or extending the suspension.

Its still true today. If a rider's #1 goal with a suspension bike is drivetrain efficiency, then a URT is the way to go. For the Racer Suspension rider, we even include a lockout lever on the handlebar so they can turn the suspension totally off.

Lightweight Everything

After working so hard to reduce frame weight, it wouldn't make sense to not use the lightest parts we could find. Everything that went on these bikes got a trip to the gram scale. Rolf wheels and RockShox SID suspension parts help keep the SLs svelte. But we did not forget that this bike will be ridden hard. So you won't find anything not up to the task.

One exception to the lightweight credo was to add a Hayes disc brake mount to the rear triangle. We fought over adding the extra 40 grams, but we all agree that disc brakes are going to be more and more important in the future.

Cross country racer suspension

We know that Pros will probably always race mainly on hardtails. They have incredible handling skills, so don't need suspension to help them ride technical terrain. They are super fit and can handle all sorts of impact to their bodies, so they don't need the extra comfort. And since their paycheck is on the line, they don't want a single gram of extra weight on their bikes.

Not all of us are Pros, though. Some of us can use a little suspension. But rather than focus on a super-plush design that rides like a Cadillac, the racer-types among us choose the 'Porsche' feel of a Y SL. To enhance the high-performance feel, the suspension for 99 has been tightened up with a 63mm travel fork, and 3" of rear wheel travel.

Fitting the Y SL

Because the SL is designed to be ridden with sag (and the rear will sag more than the front), make sure you account for this when setting up the saddle. The distance from the bottom bracket to the saddle does not change by a measurable amount, but the bottom bracket will move towards the ground and the saddle will end up at a different angle than when unweighted.

We like to set the bike up with the saddle slightly forward and nose tilted down. Then when you sit on the bike, the saddle moves back and the rear of the saddle drops slightly. Presto- the saddle is right where it should be.

How much sag? The correct sag should be between 10 and 20% of total shock stroke, meaning the bottom bracket should drop about 1/4".

Y SL Geometry

Frame size	S	M	L
Head angle	71.5	71.6	71.6
Seat angle	74.5	73.6	72.6
MM			
Standover	712	730	750
Seat tube	445	483	533
Head tube	125	125	145
Eff. top tube	562	611	641
Chainstay	425	425	425
BB height	313	313	313
Fork offset	42	42	42
Trail	68	68	68
Wheelbase	1059	1099	1115
INCH			
Standover	28.0	28.7	29.5
Seat tube	17.5	19.0	21.0
Head tube	4.9	4.9	5.7
Eff. top tube	22.1	24.1	25.2
Chainstay	16.7	16.7	16.7
BB height	12.3	12.3	12.3
Fork offset	1.7	1.7	1.7
Trail	2.7	2.7	2.7
Wheelbase	41.7	43.3	43.9

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	35.0mm
Headset size	25.4/34.0/30.0
Fork length	433mm (427 on Y3)
Front derailleur	34.9mm low clamp (only) Top pull
Bottom bracket	73mm
Shock length	6.25" (6.5" on Y3)
Shock eye width	5/8" top, 7/8" bottom
Shock eye ID	6mm
Shock stroke	1.0" (1.5" on Y3)
Rear wheel travel	3.0" (4.5" on Y3)
Rear hub OLD	135mm
Cable stops	4 cables (3 on Y3)
Disc brake mount	Hayes type (Not on Y3)
Bottle mounts	1 frame, 1 seatpost
Rack mounts	No

Y bikes are designed to accept 27.2mm seat posts with a tolerance of 27.10 to 27.20mm outer diameter. Measure the seatpost for conformity to this tolerance prior to installation.

With OCLV frames, do not grease the seatpost. OCLV bikes have a fiberglass sleeve bonded into their carbon seat tube. This sleeve prevents galvanic corrosion of the seatpost and carbon, so no grease is needed, nor recommended. If grease is applied, it may be very difficult to get adequate clamping force to hold the seatpost. If you have accidentally greased an OCLV frame, use a cloth with some degreaser to remove the grease, using normal caution to protect bearings and paint.

Bottom bracket

Be sure bottom bracket threads are clean and well greased before insertion. Failure to do so may cause galling of the threads

Removing Headset Cups

When removing an headset in an OCLV frame, make sure the headset removal tool is engaging the headset cup. OCLV framesets do not utilize a continuous headtube, but instead use two short inserts to support the headset cups. If the headset tool is outside the insert rather than inside the insert and pressing on the cup, frame damage can result.

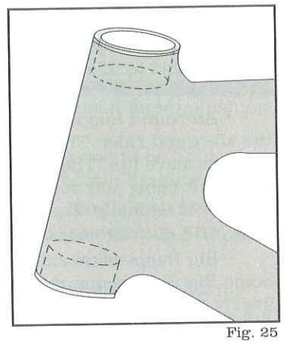


Fig. 25

Y Bike Parts list

Pivot axle	53087
Remote damping lever	972926
Y SL shock mount plates	64303
Seatpost clamp	981630
Replaceable derailleur hanger	980116

Y 3 Geometry

Frame size	S	M	L
Head angle	71.0	71.0	71.0
Seat angle	74.0	73.0	72.0
MM			
Standover	710	740	739
Seat tube	432	483	533
Head tube	105	125	125
Eff. top tube	564	612	644
Chainstay	425	425	425
BB height	302	302	302
Fork offset	39	39	39
Trail	74	74	74
Wheelbase	1047	1087	1109
INCH			
Standover	28.0	29.1	29.1
Seat tube	17.0	19.0	21.0
Head tube	4.1	4.9	4.9
Eff. top tube	22.2	24.1	25.4
Chainstay	16.7	16.7	16.7
BB height	11.9	11.9	11.9
Fork offset	1.5	1.5	1.5
Trail	2.9	2.9	2.9
Wheelbase	41.2	42.8	43.7

Intensity: Pro
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Y SL 300

Our Price $_____

Frameset	OCLV HC superlight carbon fiber com posite
Main tubes	OCLV HC carbon fiber composite
Stays	6061 T6 aluminum URT
Fork	RockShox SID SL Ti, 63mm
Rear shock	RockShox SID w/remote adjust
Headset	WTB Momentum AL Threadless
Handlebars	ICON Ernie, 2014, 7° bend
Stem	ICON Durante, direct connect
Bar ends	-
Grips	Bontrager Race
Shifters	Shimano Deore XT RapidFire SL
Front derailleur	Shimano Deore XT
Rear derailleur	Shimano XTR
Front brake	Shimano Deore XT V
Rear brake	Shimano Deore XT V
Brake levers	Integrated brake/shift
Crankset	ICON Tork, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN72, 73 x 113
Pedals	Time Atac, 9/16" axle
Cassette	Shimano XT 11-34, 9spd
Chain	Shimano HG72, 108 length, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 20° Radial, 250 Rear 24° 2x, 261/260 (D/ND)
Saddle	Bontrager FS Race Lite, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Propel XC
Front hub	Rolf/ Hugi
Rear hub	Rolf/ Hugi
Front tire	Bontrager Revolt Super-X, folding, 49/48
Rear tire	Bontrager Revolt Super-X, folding, 49/48
Spokes	DT Competition 2.0/1.8, alloy nips
Tubes	Presta valve, ultra light

- Y SL frame- OCLV HC construction for very low weight and with high strength
- Pro geometry- long front center for stability, counter-steering for balance at high speed
- Pro Adjust aluminum rear triangle- tuned geometry for fork length
- Rolf wheels- strong, light, and low maintenance
- RockShox SID SL Ti, 63mm- Top racing fork with 4 external tuning options
- RockShox SID rear shock, 3" rear travel- Super light, air negative, remote adjustable compression damping
- Shimano XTR shift and brake systems- superfast 9 speed shifting, powerful V linkage-type stopping control
- ICON Tork cranks- strong and light, fast shifting, long wearing 9 speed rings
- Time clipless pedals- Rated #1 by Mountain Bike magazine

Additionals 2 water bottle mounts, shock pump, handlebar mount damping adjuster

Colors Nude carbon w UV clear/ Blue fork
• Yellow decals

Bike sizes	S	M	L
Bar width/rise	580/0	580/0	580/0
Stem length	90/7°	105/7°	120/7°
Crank length	170	175	180
Seatpost length	250	350	350
Steerer length	208	208	228
Rear shock spring	Air		
MM Reach	643	706	749
Handlebar height	816	828	859
IN Reach	25.3	27.8	29.5
Handlebar height	32.1	32.6	33.8

Y SL 200

Our Price $_____

Intensity: Pro
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Frameset	OCLV HC superlight carbon fiber com posite
Main tubes	OCLV HC carbon fiber composite
Stays	6061 T6 aluminum URT
Fork	RockShox SID XC, 63mm
Rear shock	RockShox SID w/remote adjust
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Ernie, 2014, 7° bend
Stem	ICON Durante, direct connect
Bar ends	-
Grips	Bontrager Ergo
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano XTR
Front brake	Avid Single Digit 20, direct pull
Rear brake	Avid Single Digit 20, direct pull
Brake levers	Avid SD-1.9 L, long pull
Crankset	ICON Crankshaft, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52, 73 x 113
Pedals	Bontrager RE-1, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 length, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 20° Radial, 250 Rear 24° 2x, 261/260 (D/ND)
Saddle	Bontrager FS Race, Cro-Moly rails
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Dolomite
Front hub	Rolf
Rear hub	Rolf
Front tire	Bontrager Revolt ST-2, folding, 49/53
Rear tire	Bontrager Revolt ST-2, folding, 46/50
Spokes	DT 14/15G butted stainless
Tubes	Presta valve, ultra light

- Y SL frame- OCLV HC construction for very low weight and with high strength
- Pro geometry- long front center for stability, counter-steering for balance at high speed
- Pro Adjust aluminum rear triangle- tuned geometry for fork length
- Rolf wheels- strong, light, and low maintenance
- RockShox SID XC, 63mm- Same function as top end fork, one of the lightest
- RockShox SID rear shock, 3" rear travel- Super light, air negative, remote adjustable compression damping
- Shimano XTR rear derailleur- superfast 9 speed shifting
- ICON Crankshaft cranks- strong and light, fast shifting, long wearing 9 speed rings
- Bontrager RE-1 pedals- Float and excellent mud clearance on SPD-style cleats

Additionals 2 water bottle mounts, shock pump, handlebar mount damping adjuster

Colors Nude carbon w UV clear/ Red fork • Yellow decals

Bike sizes	S	M	L
Bar width/rise	580/0	580/0	580/0
Stem length	90/7°	105/7°	120/7°
Crank length	170	175	180
Seatpost length	400	350	350
Steerer length	209	209	229
Rear shock spring	Air		
MM Reach	643	706	749
Handlebar height	816	828	859
IN Reach	25.3	27.8	29.5
Handlebar height	32.1	32.6	33.8

Y 3

Our Price $_____

Intensity: Training
Surface types: Singletrack
Topography: Mountainous
Distance: Extended dirt
Spec level: Competitive

Frameset	Pro Active Uni-Link aluminum front, Cro-Moly rear
Main tubes	6061 T6 Trek design aluminum
Stays	Cro-Moly
Fork	RockShox Jett C, 45mm
Rear shock	Fox Vanilla coilover
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	Forged alloy direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano Alivio RapidFire+
Front derailleur	Shimano Alivio
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LV77E direct pull
Crankset	Shimano Acera-X 42/32/22
Bottom bracket	Shimano BB-LP27, 73 x 113
Pedals	Resin/alloy cage w/clips, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 106 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 265 Rear 32° 3x, 262/263 (D/ND)
Saddle	Trek Crossbow
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/quick release
Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	15G stainless
Tubes	Presta valve

- Pro geometry- long front center for stability, counter-steering for balance at high speed
- Pro Active Uni-Link suspension- plush, fully active, and still an efficient drivetrain
- RockShox Jett C fork- lightweight elastomer fork smoothens bumps
- Fox Vanilla rear shock- plush, active, and dependable
- Direct pull brakes- excellent stopping power
- 8 speed cassette- lots of gears
- Acera-X crank- 22t low gear
- Bontrager ASYM wheelset- light and strong
- Bontrager Jones tires- light, super grip, larger casings for better shock absorption
- Riser stem with ICON handlebar- comfortable position

Additionals 1 water bottle mount

Colors Inkwell Blue/ Black fork • Black decal

Bike sizes	S	M	L
Bar width/rise	580/0	580/0	580/0
Stem length	90/25°	110/25°	130/25°
Crank length	170	175	175
Seatpost length	300	350	350
Steerer length	188	208	208
Rear shock spring	600	700	800
MM Reach	629	691	738
Handlebar height	819	857	871
IN Reach	24.8	27.2	29.0
Handlebar height	32.3	33.8	34.3

OCLV Hardtail

The Best Mountain Race Bike Ever!

Strong words. But this bike DOES have it all. Pro Geometry designed by Trek engineering with input from some of the best NORBA pros on the circuit. Ride tuned stiffness that's size specific. Made from the best frame material on the planet: OCLV carbon fiber composite and OCLV HC. The overall result is a stronger and stiffer structure in the new Trek race frames. And even though they're super light, these frames are covered by Trek's Limited Lifetime Warranty.

Pro Geometry

The new race bike frameset is built on Trek's Pro geometry, which means it has the handling and manners needed for the higher racing speeds found on the NORBA race circuit. Instead of making a bike that steers quickly so you can adjust your line in a turn, this bike has directional stability that lets you pick a line early and hold it. It has a touch of understeer, so if you go into a corner a little too hot, just lean it in a bit more with a touch of rear brake, and go. Instead of skittering around and washing the front tire, the additional lean puts more edge knobs onto the ground, and the bike really carves. Its lightweight frame makes it quick from edge to edge, so it handles tight turns really well. And the longer wheelbase works like a giant slalom ski so high speed fire road riding is a breeze.

This is a bike that likes to be counter-steered, an advanced handling technique where the bike is leaned deeply into a turn while the rider keeps their body more upright. Like a skier, this keeps the body balanced and agile, and puts the edge knobs into the turn, where hard biting traction is at its cornering best. Pick a line and the Pro geometry will hold it. This is important, because the Pros are going too fast to change lines in a corner. They just use their awesome talent to pick the line early, and Pro geometry does the rest.

By using a longer front-center (the distance from the cranks to the front axle) the front wheel is pushed further ahead of the rider. Anytime you find yourself moving back on your bike, its in response to your body wanting to flip over the front axle. This happens on steep downhills, and also any time the bike is moving at high speed in rough terrain. When the Trek engineers moved the front axle forward, it added resistance to over-the-bars flight. You're more relaxed at speed, and since you're more in the saddle than behind it, you're in a better pedaling position to keep the power on.

With a longer front-center, the bike requires a longer top tube unless you want some pretty funny steering geometry. The shorter stem puts your hands closer to the steering axis so steering can be done with your arms instead of a sweeping sideways movement of your shoulders. Your hands can move faster than your shoulders, so technical steering is precise at high speed.

Common sense tells us that a longer front center places less weight on the front wheel. Intuition tells us that with less weight on the front wheel, the bike might not climb well. But geometry charts only tell part of the story, and this bike actually climbs very well. Here's two reasons why: with a shorter stem, the riders shoulders stay more over the centerline of the bike, even when turning. When your center of gravity stays over the frame centerline, the bike stays in better balance. With Pro geometry, its even easier to hold your line on steep, slow speed climbs. Secondly, when climbing hard in first gear any bike will respond to the pressure of pedaling. Imagine if the headset were placed in the middle of the bike, right below the saddle. The bike would hinge in the middle, between contact patches of the tires. With every pedal stroke the rear wheel would turn away from the pedaling force. As a result, the front wheel would turn toward the pedal side, and the bike would swim like a salmon heading upstream. But the further ahead you move the pivot, and the closer to the rider's hands, the straighter the bike will climb. With the shorter stem used in Pro geometry, the rider stays over the bike, and the bike tracks straighter, making it climb very well indeed.

OCLV HC

OCLV means Optimum Compaction, Low Void, a superior lamination of carbon strands that nets 30% or more additional strength over some of our competitors attempts at carbon lamination. But think about it. This is Trek's 4th generation of OCLV mountain bikes. Since our OCLV patent was awarded, we've built hundreds of thousands of OCLV road, ATB, and Y frames. Stock OCLV bikes are being ridden by some of the best riders in the world, like the US Postal team, Team Trek/Volkswagen, top triathlete Mike Pigg, and too many weekend warriors to count. The feedback from all those riders has brought Trek bike design and materials to the next level.

This new level of materials is our patented OCLV HC. By laminating a honeycomb material between two layers of carbon, huge increases in stiffness and strength can be made to a bike frame, while reducing the weight. This new frame gets the HC treatment (for more on OCLV HC, see Frame Materials, page 6) and weighs just 3.0 pounds.

Built racing tough

Clearly this is a racing bike of thoroughbred heritage. Other frame details include a Hayes disc mount, aluminum chainstays, and an armored bottom bracket shell to protect against rock dings.

Disc brakes can get quite hot, and carbon composite does not like extreme heat. So our engineers knew a disc mount on a carbon stay would be a mistake. The solution to this was an aluminum stay. Using two different materials for the chainstays might have made the bike ride strange, so we are also using aluminum for the right chainstay. As a side benefit, metal chainstays are more resistant to the damaging clatter and whip of the chain. The new race bike also uses a plate style front derailleur to prevent shipping the chain off the small chainring.

Increased lateral stiffness

This bike was built for the Trek/Volkswagen team members. The team asked for a frame that is stiffer laterally than the 9900, yet without giving up that bump-smoothing compliance OCLV is famous for. This bike has the ride they asked for.

The larger diameter tubes add stiffness that compares to any bike on the racing circuit, letting big guys like Travis Brown stomp up climbs with authority. But with a few tricks in how the Trek engineers lay up the carbon, this bike has shock absorption that can't be touched by metal frames so lighter guys like Michael Rasmussen stay comfortable during long World Cup races.

The seatpost diameter is 31.6mm. We did this for several reasons. First, the larger diameter makes the seatpost both stronger and lighter. Second, the larger diameter makes the seatpost lots stiffer, and the racers like the control provided by a positive connection between the saddle and the bike.

Fitting the OCLV Hardtails

The geometry used on the OCLV hardtails is based on the same ideas as the Y SL and VRX frames, but ends up slightly different for several reasons. First, we had many requests for bigger bikes. Rather than add another size, we 'grew' the XL with a longer seat tube, and taller head tube.

To keep the other sizes in line, they also got a bit of stretching. So although the Large has a 19.5" seat tube, it actually fits a somewhat bigger rider than a 19.5" model 8900. However, the Medium fits very close to an 18" Alpha frame, but with a taller head tube.

With taller head tubes and 20mm of spacers (we've only used 15mm in the past) it may be necessary to move some spacers to the top of the stem for some customer's preferred fit.

OCLV Hardtail Geometry

Frame size	M	L	XL
Head angle	71.0	71.0	71.0
Seat angle	73.0	73.0	72.5
MM			
Standover	744	782	821
Seat tube	445	495	545
Head tube	125	145	165
Eff. top tube	588	625	641
Chainstay	424	424	424
BB height	297	297	297
Fork offset	42	42	42
Trail	71	71	71
Wheelbase	1064	1102	1113
INCH			
Standover	29.3	30.8	32.3
Seat tube	17.5	19.5	21.5
Head tube	4.9	5.7	6.5
Eff. top tube	23.1	24.6	25.2
Chainstay	16.7	16.7	16.7
BB height	11.7	11.7	11.7
Fork offset	1.7	1.7	1.7
Trail	2.8	2.8	2.8
Wheelbase	41.9	43.4	43.8

Mechanic's Specs and Notes

Seatpost diameter	31.6mm
Seatclamp diameter	39.85mm
Headset size	25.4/34.0/30.0
Fork length	426mm
Front derailleur	Direct E-type (only)
	Top pull
Bottom bracket	73mm E type
Rear hub OLD	135mm
Cable stops	3 cables on top tube
Disc brake mount	Hayes type
Bottle mounts	2
Rack mounts	No

OCLV Hardtail Parts list

Seatpost clamp	992560
Replaceable derailleur hanger	980116

The size M uses a 350mm seatpost, which if shoved all the way down will remove the water bottle mounts from the inside of the seat tube. It is imperative that you educate the customer about the consequences of shoving their saddle all the way down. Do not remove the warning tags affixed to these bikes prior to sale.

The new frame will only fit a plate-style, top pull front derailleur. Instead of necking the seat tube down, the area of an OCLV bike where a band clamp would go is a robust cross-section, making the bottom bracket as stiff as possible for instant acceleration.

This new frame is designed around a 70mm travel fork, longer than earlier OCLV bikes. However, our racers have on occasion used forks with 80mm travel with good results.

With OCLV frames, do not grease the seatpost. OCLV bikes have a fiberglass sleeve bonded into their carbon seat tube. This sleeve prevents galvanic corrosion of the seatpost and carbon, so no grease is needed, nor recommended. If grease is applied, it may be very difficult to get adequate clamping force to hold the seatpost. If you have accidentally greased an OCLV frame, use a rag with some degreaser to remove the grease, using normal caution to protect bearings and paint.

Trek OCLV mountain bikes are designed to accept 31.6mm seat posts with a tolerance of 31.08 to 31.60mm outer diameter. Measure the seatpost for conformity to this tolerance prior to installation.

Be sure bottom bracket threads are clean and well greased before insertion. Failure to do so may cause galling of the threads, especially when inserting into an aluminum bottom bracket shell.

Triple clamp forks put additional stress on a bike frame applied by both the extra length and the extra stiffness. For this reason, triple clamp forks should not be put on any Trek other than the '98 and newer dual suspension frames.

Pro XC 9.9

Our Price $_____

Intensity: Pro
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Frameset	OCLV HC superlight carbon fiber com posite
Main tubes	OCLV HC carbon fiber composite
Stays	OCLV carbon
Fork	RockShox SID SL Ti, 63mm
Headset	WTB Momentum AL Threadless
Handlebars	ICON Crushed Velvet, carbon, 7° bend
Stem	ICON Durante, direct connect
Bar ends	ICON Crushed Velvet
Grips	Bontrager Ergo
Shifters	Shimano XTR RapidFire SL
Front derailleur	Shimano XTR
Rear derailleur	Shimano XTR
Front brake	Shimano XTR V
Rear brake	Shimano XTR V
Brake levers	Integrated brake/shift
Crankset	Shimano XTR 4 arm 46/34/24
Bottom bracket	Shimano XTR, 73 x 116
Pedals	Time Atac Carbon, 9/16" axle
Cassette	Shimano XTR 12-34, 9spd
Chain	Shimano Dura-Ace, 108 L, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 20° Radial, 250 Rear 24° 2x, 261/260 (D/ND)
Saddle	Bontrager FS Race Lite, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Propel XC
Front hub	Rolf/ Hugi
Rear hub	Rolf/ Hugi
Front tire	Bontrager Revolt Super-X, folding, 49/48
Rear tire	Bontrager Revolt Super-X, folding, 49/48
Spokes	DT Competition 2.0/1.8, alloy nips
Tubes	Presta valve, ultra light

- OCLV HC frame- Lightest production racing frame on the planet
- Pro geometry- long front center for stability, counter-steering for balance at high speed
- Rolf Propel XC wheels- strong, light, low maintenance
- Bontrager Revolt Super-X tires- low profile, ultrafast
- RockShox SID SL Ti fork- extremely light with external adjustment
- XTR group- the very best in racing performance
- Bontrager FS Race Lite saddle- Ti rails for low eight, leather cover for comfort
- Time Atac pedals- dependable release in any conditions
- Icon Crushed Velvet handlebars and bar ends- strong and light

Additionals 2 water bottle mounts

Colors VW Team/ Blue fork • Black decal

Bike sizes	M	L	XL
Handlebar width	580	580	580
Handlebar rise	0	0	0
Stem length	105/7°	105/7°	120/7°
Crank length	175	175	180
Seatpost length	350	350	350
Steerer length	208	228	248
MM Reach	682	719	749
Handlebar height	839	858	889
IN Reach	26.9	28.3	29.5
Handlebar height	33.0	33.8	35.0

Intensity: Pro
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Elite XC 9.8

Our Price $_____

Frameset	OCLV HC superlight carbon fiber com posite
Main tubes	OCLV HC carbon fiber composite
Stays	OCLV carbon
Fork	RockShox SID XC, 63mm
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Ernie, 2014, 7° bend
Stem	ICON Durante, direct connect
Bar ends	ICON Fatty McGee
Grips	Bontrager Ergo
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano XTR
Front brake	Avid Single Digit 20, direct pull
Rear brake	Avid Single Digit 20, direct pull
Brake levers	Avid SD-1.9 L, long pull
Crankset	ICON Crankshaft, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52E, 73 x 113
Pedals	Bontrager RE-1, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 l, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 20° Radial, 250 Rear 24° 2x, 261/260 (D/ND)
Saddle	Bontrager FS Race, Cro-Moly rails
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Dolomite
Front hub	Rolf
Rear hub	Rolf
Front tire	Bontrager Revolt ST-2, folding, 49/53
Rear tire	Bontrager Revolt ST-2, folding, 46/50
Spokes	DT 14/15G butted stainless
Tubes	Presta valve, ultra light

- OCLV HC frame- Lightest production racing frame on the planet
- Pro geometry- long front center for stability, counter-steering for balance at high speed
- Rolf Dolomite wheels- strong, light, low maintenance
- Bontrager Revolt ST-2 folding tires- light, and full tread pattern with reduced knob height for speed
- RockShox SID XC fork- same performance as top of the line SID SL Ti
- ICON Crankshaft cranks- light, strong, 9 speed, durable chainrings
- Shimano XTR rear derailleur- Pro level shifting

Additionals 2 water bottle mounts

Colors Black Gold/ Red fork • Red decal

Bike sizes	M	L	XL
Handlebar width	580	580	580
Handlebar rise	0	0	0
Stem length	105/7°	105/7°	120/7°
Crank length	170	175	180
Seatpost length	350	350	350
Steerer length	209	229	249
MM Reach	682	719	749
Handlebar height	834	858	888
IN Reach	26.9	28.3	29.5
Handlebar height	32.8	33.8	35.0

Alpha Mountain

Our 1998 introduction of Alpha mountain bike frame technology was an overwhelming success. This series of hardtails ride extremely well in a wide variety of conditions. The subtle blending of tube diameters and shapes makes a very strong, very light frame with excellent pedal response, yet avoids the overly harsh ride of some aluminum bikes.

Alpha frame features:

- Double butted 6061 T6 aluminum tubing (SL only)
- Outer butted head tube
- Ovalized, oversized down tube
- Downtube/headtube butterfly gusset
- Cold forged dropouts
- Replaceable derailleur hanger
- Hayes type disc brake mount (SL and ZX only)
- Smoothed cable stops
- Round/oval chainstays with right hand gusset
- 2 bottle mounts, rear rack eyelets
- Light weight (3.45, 3.7, 4.2# for the SL, ZX, and Alpha)

Frame details and benefits

The first thing people notice is the large, oval down tube. The oval shape has several benefits. The major stress on the downtube is in a vertical plane, and by increasing the tube dimensions in this plane, we get an increase in frontal impact strength. Since the oval shape adds surface contact to both the head tube and seat tube/bottom bracket, we also get increased strength from the larger weld area. But the downtube is also wider than those we've used in the past, so we get an overall increase in bottom bracket stiffness for better pedaling efficiency. This bike climbs like a rocket. And the increased overall lateral stiffness lets it handle twisty turns without flinching.

Other special touches to make this bike last longer include the downtube gusset, which adds additional frontal strength and fatigue resistance. The outer butted head tube is thicker where the headset cups insert, eliminating deformation to the head tube which could cause premature headset wear. The smooth cable stops keep your clothes from getting snagged, as well as helping prevent dirt from collecting.

On the rear of the bike, there are new round to oval chainstays. The larger diameter, round stay attachment to the bottom bracket increases weld area for strength, while adding even more rear end stiffness than '98. The right hand gusset addresses the extra stress on the right side of the bike without adding extra weight on the left side.

Even the dropouts are trick. The highly formed, cold forged rear drops are great looking, but more important they are extra strong. It just doesn't make sense to make a laterally rigid frame and then let that effort go to waste by using wimpy stamped dropouts. New for '99, the Hayes compatible rear disc mount can be found all the way to the 6500. This reflects our belief that disc brakes are going to be more important in the future. Those who wisely bought Trek bikes with this feature will be ready for disc brake technology. And although the Alpha SL and ZX make excellent race frames, we put eyelets on the rear drops to add to their reputation as great all-round mountain bikes.

Long Travel hardtails

Our product managers spend a lot of time playing with new concepts and ideas. And they spend a lot of time visiting dealers, races, and local riding areas. From these inspirations, we found that the Alpha frames aren't just race bikes. They are great all-round singletrack bikes. And they even can be ridden as adventure bikes in a long-travel, funhog mode.

We equipped the 8500LT like this, and its a blast to ride. The 8500 uses a standard Alpha SL frame, but with a 100mm travel fork, suspension seatpost, and wide, riser handlebars. Think of the 8500 as a full suspension bike for those who are afraid of full suspension. It has the advantages of control and comfort, but without the weight, complexity, cost, or loss of pedaling efficiency.

When we first decided to try this, we thought the bike would behave poorly. Boy, were we wrong. The wide bars and long travel front end lets you descend with confidence. The suspension seatpost lets you sit in the saddle and grind on the climbs, but when you stand up you get the instant acceleration of a hardtail. True, this is not the ideal bike for racing, but not everyone is racing. Lots of folks just want to have fun, the the 8500 is the bike for them.

Everyone who tried it thought it was about the most fun bike they had ever ridden. When the magazine editors got to try the 8500LT in a sneak preview, they agreed. The longer fork makes the head angle a bit shallower, but there is less weight on the front wheel. When combined with the change in weight distribution brought on by the taller fork and riser bars, the trail of the front end balances out for really great downhill handling. When climbing, you have to move a little further forward to keep the front end steady, but for the funhog rider, its a small price to pay.

An important detail on the 8500 is the front disc brake. Its great. And if the 8500 rider decides they want two disc brakes, we made it easy because the rear hub, and the frame, are disc compatible. Instead of going to the expense of building a new rear wheel, all that's needed is the caliper, a longer brake cable, and bolt a rotor to the disc compatible rear hub.

WSD

An exciting new addition to the Alpha line-up is WSD (Women's Specific Design) frames incorporated in the models 6500 and 8000. Not only do these bikes address the fit needs of performance-oriented women riders, they have been tweaked to ride better with the change in position and weight distribution. For more on WSD, see page 9.

Although our intent was to build bikes specifically for women, we've also had some shorter men give high praise for the performance of these new frames.

Alpha

The models 6000, 4000, 830AL, and 820AL use a different tubeset of 7005 aluminum, but their geometry is very similar. The exceptions are the additions of sizes in some models, including Ladies step-through type frames.

Fitting the Alpha, Alpha ZX, and Alpha SL

To best fit the Alpha frames, pay attention to the reach and handlebar height. Once you've found the bike which most closely gives the desired fit, check that the standover is at least one inch, and preferably slightly more. Then you can adjust the bar height using the 20mm of spacers, and adjust the saddle position. On the 8500LT, remember to adjust the suspension seatpost, as covered in the RockShox section of Other Components, page 18.

Alpha SL and ZX Geometry

Frame size	13	16.5	18	19.5	21
Head angle	71.0	71.0	71.0	71.0	71.0
Seat angle	74.0	73.5	73.0	73.0	72.5
MM					
Standover	661	714	742	774	805
Seat tube	330	419	457	495	533
Head tube	90	90	105	125	145
Eff. top tube	536	566	584	596	610
Chainstay	424	424	424	424	424
BB height	288	291	293	295	297
Fork offset	42	42	42	42	42
Trail	71	71	71	71	71
Wheelbase	1015	1042	1057	1070	1080
INCH					
Standover	26.0	28.1	29.2	30.5	31.7
Seat tube	13.0	16.5	18.0	19.5	21.0
Head tube	3.5	3.5	4.1	4.9	5.7
Eff. top tube	21.1	22.3	23.0	23.5	24.0
Chainstay	16.7	16.7	16.7	16.7	16.7
BB height	11.3	11.5	11.5	11.6	11.7
Fork offset	1.7	1.7	1.7	1.7	1.7
Trail	2.8	2.8	2.8	2.8	2.8
Wheelbase	40.0	41.0	41.6	42.1	42.5

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	35.0mm
Headset size	25.4/34.0/30.0
Fork length	415mm
Front derailleur	34.9mm
	Top pull
Bottom bracket	73mm
Rear hub OLD	135mm
Cable stops	3 cables on top tube
Disc brake mount	Hayes type (SL, ZX only)
Bottle mounts	2
Rack mounts	Yes

Alpha Parts list

Seatpost clamp	981630
Replaceable derailleur hanger	980116

Mechanic's Specs and Notes

Th Alpha frame is designed around a 63mm travel fork.

Alpha frames are designed to accept 27.2mm seat posts with a tolerance of 27.08 to 27.20mm outer diameter. Measure the seatpost for conformity to this tolerance prior to installation.

Be sure bottom bracket threads are clean and well greased before insertion. Failure to do so may cause galling of the threads, especially when inserting into an aluminum bottom bracket shell.

Triple clamp forks put additional stress on a bike frame applied by extra length and the extra stiffness. For this reason, triple clamp forks should not be put on any Trek other than the '98 and newer dual suspension frames.

Alpha ATB Geometry

Frame size	13	16.5	18	19.5	21	22.5	13W	17W
Head angle	70.5	71.0	71.0	71.0	71.0	71.0	71.0	71.0
Seat angle	74.0	73.5	73.0	73.0	73.0	72.5	73.5	73.0
MM								
Standover	650	712	741	772	802	839	678	688
Seat tube	330	419	457	495	533	572	419	495
Head tube	90	90	105	125	145	185	125	145
Eff. top tube	530	560	579	589	600	610	558	588
Chainstay	430	430	430	430	430	430	430	430
BB height	288	295	298	298	298	300	295	295
Fork offset	38	38	38	38	38	38	38	38
Trail	79	75	75	75	75	75	75	75
Wheelbase	1016	1039	1055	1066	1078	1084	1039	1066
INCH								
Standover	25.6	28.0	29.2	30.4	31.6	33.0	26.7	27.1
Seat tube	13.0	16.5	18.0	19.5	21.0	22.5	16.5	19.5
Head tube	3.5	3.5	4.1	4.9	5.7	7.3	4.9	5.7
Eff. top tube	20.9	22.0	22.8	23.2	23.6	24.0	22.0	23.1
Chainstay	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9
BB height	11.3	11.6	11.7	11.7	11.7	11.8	11.6	11.6
Fork offset	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Trail	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Wheelbase	40.0	40.9	41.5	42.0	42.4	42.7	40.9	42.0

WSD Alpha ATB Geometry

Frame size	XS	S	M
Head angle	70.0	70.0	70.0
Seat angle	75.0	74.0	73.5
MM			
Standover	670	700	740
Seat tube	355	406	457
Head tube	90	90	105
Eff. top tube	520	534	565
Chainstay	424	424	424
BB height	288	288	293
Fork offset	42	42	42
Trail	78	78	78
Wheelbase	1018	1023	1051
INCH			
Standover	26.4	27.6	29.1
Seat tube	14.0	16.0	18.0
Head tube	3.5	3.5	4.1
Eff. top tube	20.5	21.0	22.2
Chainstay	16.7	16.7	16.7
BB height	11.3	11.3	11.5
Fork offset	1.7	1.7	1.7
Trail	3.1	3.1	3.1
Wheelbase	40.1	40.3	41.4

8900

Our Price $_____

Intensity: Pro
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Frameset	Alpha SL aluminum
Main tubes	Butted 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox Judy SL, 63mm
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Ernie, 2014, 7° bend
Stem	ICON Durante, direct connect
Bar ends	ICON Fatty McGee
Grips	Bontrager Ergo
Shifters	Shimano Deore XT RapidFire SL
Front derailleur	Shimano Deore XT
Rear derailleur	Shimano XTR
Front brake	Hayes Disc, full hydraulic
Rear brake	Hayes Disc, full hydraulic
Brake levers	Hayes hydraulic
Crankset	ICON Crankshaft, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52, 73 x 113
Pedals	Bontrager RE-1, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 l, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 24° 2x, 261/263 Rear 24° 2x, 261/260 (D/ND)
Saddle	Bontrager FS Race, Cro-Moly rails
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Dolomite Disk
Front hub	Rolf
Rear hub	Rolf
Front tire	Bontrager Revolt ST-2, folding, 49/53
Rear tire	Bontrager Revolt ST-2, folding, 46/50
Spokes	DT 14/15G butted stainless
Tubes	Presta valve, ultra light

- Alpha SL double butted aluminum frame- Light, strong, singletrack geometry
- Rolf Dolomite Disk wheels- light, strong, disc brake optimized
- RockShox Judy SL fork- strong, light, plush, highly tunable
- Hayes full hydraulic disc brakes- open system with excellent stopping in any conditions
- Shimano XTR rear derailleur- super fast shifts
- ICON Crankshaft cranks- 9 speed, better shifting
- Bontrager Revolt ST-2 tires- shorty tread is fast and grippy
- ICON Fatty McGee bar ends- more hand positions, better climbing
- Bontrager RE-1 pedals- mud evacuation and SPD type cleats

Additionals 2 water bottle mounts (1 on 13")

Colors Trek Red/ Red fork • Black decal

Bike sizes	16.5	18	19.5	21
Handlebar width	580	580	580	580
Handlebar rise	0	0	0	0
Stem length	105/7°	120/7°	120/7°	135/7°
Crank length	175	175	175	180
Seatpost length	350	350	350	350
Steerer length	173	188	208	228
MM Reach	660	692	704	731
Handlebar height	795	814	831	859
IN Reach	26.0	27.2	27.7	28.8
Handlebar height	31.3	32.0	32.7	33.8

8500 LT

Our Price $_____

Intensity: Training
Surface types: Extreme or abusive dirt
Topography: Mountainous
Distance: Long distance
Spec level: Competitive

Frameset	Alpha SL aluminum
Main tubes	Butted 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox Judy 100, 100mm
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Diesel, 9° bend, 30mm rise
Stem	ICON Durante, direct connect
Bar ends	-
Grips	Bontrager Ergo
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano Deore XT SGS
Front brake	Hayes Disc, cable actuated
Rear brake	Avid Single Digit 10, direct pull
Brake levers	Avid AD-1.0 L, long pull
Crankset	ICON Flywheel, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52, 73 x 113
Pedals	Bontrager RE-1, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 106 l, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 266/262 Rear 32° 3x, 262/264 (D/ND)
Saddle	Bontrager FS+10 Race, Cro-Moly rails
Seatpost	RockShox shock absorber
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Maverick ASYM
Rear Rim	Bontrager Maverick ASYM
Front hub	Formula disc
Rear hub	Formula disc
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve, ultra light

- Alpha SL double butted aluminum frame- Light, strong, singletrack geometry
- Disc compatible rear hub- easy upgrade to full disc brakes
- RockShox Judy 100 fork- long travel
- Hayes front disc brake- excellent stopping in any conditions
- Bontrager Maverick ASYM rims front and rear- less dish for stronger wheels
- RockShox suspension seatpost- simplified rear suspension
- ICON Flywheel cranks- 9 speed, better shifting
- Shimano UN52 bottom bracket- smoother, longer lasting bearings
- Bontrager Jones tires- big casing and full knobs for traction, durability, shock absorption
- Bontrager RE-1 pedals- mud evacuation and SPD type cleats

Additionals 2 water bottle mounts (1 on 13")

Colors Black Gold/ Red fork • Red decal

Bike sizes	16.5	18	19.5	21
Handlebar width	620	620	620	620
Handlebar rise	30	30	30	30
Stem length	105/7°	120/7°	120/7°	135/7°
Crank length	175	175	175	175
Seatpost length	350	350	350	350
Steerer length	174	189	209	229
MM Reach	660	692	704	731
Handlebar height	823	842	859	883
IN Reach	26.0	27.2	27.7	28.8
Handlebar height	32.4	33.2	33.8	34.7

8000

Our Price $_____

Intensity: Racing
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	Alpha SL aluminum
Main tubes	Butted 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	Manitou SX, 70mm
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	ICON Phifteen, direct connect
Bar ends	ICON Fatty McGee
Grips	Bontrager Ergo
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano Deore XT SGS
Front brake	Avid Single Digit 20, direct pull
Rear brake	Avid Single Digit 20, direct pull
Brake levers	Avid SD-1.9 L, long pull
Crankset	ICON Crankshaft, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52, 73 x 113
Pedals	Bontrager RE-1, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 l, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254 Rear 32° 3x, 264/265 (D/ND)
Saddle	Bontrager FS+10 Race, Cro-Moly/leather
Seatpost	ICON Moses, 6061 Al
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Maverick
Rear Rim	Bontrager Maverick ASYM
Front hub	Bontrager Comp II
Rear hub	Shimano Deore LX
Front tire	Bontrager Revolt ST-2, folding, 49/53
Rear tire	Bontrager Revolt ST-2, folding, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve

- Alpha SL double butted aluminum frame- Light, strong, singletrack geometry
- Bontrager Maverick/ASYM rims- less dish for even spoke tension, machined for smooth braking, eyeletted and welded for strength
- Manitou SX fork, 70mm travel- TPC damping for smooth control
- Dia-Compe SA headset- alloy for low weight
- ICON Crankshaft cranks- 9 speed, better shifting
- Avid SD20 brakes- stainless hardware for long life
- Shimano UN52 bottom bracket- smoother, longer lasting bearings
- Bontrager RE-1 pedals- mud evacuation and SPD type cleats
- Bontrager Revolt ST-2 tires- fast and grippy
- ICON Fatty McGee bar ends- more hand positions for comfort, climbing power

Additionals 2 water bottle mounts (1 on 13")

Colors Team Blue/ Red fork • Black decal
Pearl White/ Red fork • Black decal

Bike sizes	13	16.5	18	19.5	21
Handlebar width	580	580	580	580	580
Handlebar rise	0	0	0	0	0
Stem length	90/15°	105/15°	120/15°	120/15°	135/15°
Crank length	170	175	175	175	180
Seatpost length	250	350	350	350	350
Steerer length	174	174	189	209	229
MM Reach	611	653	683	695	722
Handlebar height	798	809	829	846	876
IN Reach	24.0	25.7	26.9	27.4	28.4
Handlebar height	31.4	31.8	32.6	33.3	34.5

8000 WSD

Our Price $_____

Intensity: Racing
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	Alpha SL aluminum
Main tubes	Butted 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	Manitou SX, soft springs, 70mm
Headset	Dia-Compe SA Aheadset, alloy
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	ICON Phifteen, direct connect
Bar ends	Trek
Grips	Bontrager dual density
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano Deore XT SGS
Front brake	Avid Single Digit 20, direct pull
Rear brake	Avid Single Digit 20, direct pull
Brake levers	Lee Chi LV30E, short reach direct pull
Crankset	ICON Crankshaft, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52, 73 x 113
Pedals	Bontrager RE-1, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 l, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254 Rear 32° 3x, 264/265 (D/ND)
Saddle	Trek WSD
Seatpost	ICON Moses, 6061 Al
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Maverick
Rear Rim	Bontrager Maverick ASYM
Front hub	Bontrager Comp II
Rear hub	Shimano Deore LX
Front tire	Bontrager Revolt ST-2, folding, 49/53
Rear tire	Bontrager Revolt ST-2, folding, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve

- Alpha SL double butted aluminum frame- Light, strong, singletrack geometry
- WSD geometry- better performance for women
- Bontrager Maverick/ASYM rims- less dish for even spoke tension, machined for smooth braking, eyeletted and welded for strength
- Manitou SX fork, 70mm travel, light springs- TPC damping for smooth control
- Dia-Compe SA headset- alloy for low weight
- ICON Crankshaft cranks- 9 speed, better shifting
- Avid SD20 brakes- stainless hardware for long life
- Shimano UN52 bottom bracket- smoother, longer lasting bearings
- Bontrager RE-1 pedals- mud evacuation and SPD type cleats
- Bontrager Revolt ST-2 tires- fast and grippy

Additionals 2 water bottle mounts (1 on 13")

Colors Pearl White/ Blue fork • Blue decal

Bike sizes	XS	S	M
Handlebar width	560	560	560
Handlebar rise	0	0	0
Stem length	90/15°	105/15°	105/15°
Crank length	170	170	175
Seatpost length	250	300	300
Steerer length	174	174	189
MM Reach	594	620	651
Handlebar height	796	805	819
IN Reach	23.4	24.4	25.6
Handlebar height	31.3	31.7	32.2

7000

Our Price $_____

Intensity: Training
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	Alpha ZX aluminum
Main tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox Judy XC, 63mm
Headset	Dia-Compe ST Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	ICON Phifteen, direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano Deore LX RapidFire+
Front derailleur	Shimano Deore LX
Rear derailleur	Shimano Deore XT SGS
Front brake	Avid Single Digit 10, direct pull
Rear brake	Avid Single Digit 10, direct pull
Brake levers	Avid AD-1.0 L, long pull
Crankset	ICON Flywheel, 4 arm 44/32/22
Bottom bracket	Shimano BB-UN52, 73 x 113
Pedals	ICON SoleMate, 9/16" axle
Cassette	Shimano HG70 11-32, 9spd
Chain	Shimano HG72, 108 L, 9 speed
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254
	Rear 32° 3x, 264/265 (D/ND)
Saddle	Bontrager FS+10 Comp
Seatpost	ICON Moses, 6061 Al
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	Bontrager Comp II
Rear hub	Bontrager Comp II
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve

- Alpha ZX aluminum frame- Light, strong, singletrack geometry, Hayes mount
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking
- RockShox Judy XC fork, 63mm travel- plush, extra steering control
- XT rear derailleur, LX shifters- 9 speed
- ICON Flywheel cranks- 9 speed, better shifting, wider gear range
- Shimano UN52 bottom bracket- smoother, longer lasting bearings
- Avid brakes- powerful stopping, easy to adjust
- ICON Solemate pedals- clipless, wide platform for support
- Bontrager Jones tires- big casing and full knobs for traction, durability, shock absorption
- Bontrager FS+10 saddle- technical shape with all-day comfort

Additionals	2 water bottle mounts (1 on 13")
Colors	Dragonfly Green/ Yellow fork • Black decal
	Metal Flake Blue/ Yellow fork • Yellow decal

Bike sizes	13	16.5	18	19.5	21
Handlebar width	580	580	580	580	580
Handlebar rise	0	0	0	0	0
Stem length	90/15°	105/15°	120/15°	120/15°	135/15°
Crank length	170	175	175	175	175
Seatpost length	250	350	350	350	350
Steerer length	172	172	187	207	227
MM Reach	611	653	683	695	722
Handlebar height	796	807	827	844	869
IN Reach	24.0	25.7	26.9	27.4	28.4
Handlebar height	31.3	31.8	32.6	33.2	34.2

Intensity: Training
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

6500

Our Price $_____

Frameset	Alpha ZX aluminum
Main tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox Judy C, 65mm
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	Forged alloy direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano STX-RC RapidFire+
Front derailleur	Shimano Alivio
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LV77E direct pull
Crankset	Shimano Alivio 42/32/22
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	IG31, 106 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254
	Rear 32° 3x, 264/265 (D/ND)
Saddle	Bontrager FS+10 Comp
Seatpost	SP-312 alloy micro-adjust
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	Bontrager Comp I
Rear hub	Bontrager Comp II
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve

- Alpha ZX aluminum frame- Light, strong, singletrack geometry, Hayes mount
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking
- DT stainless spokes- strong, light, lasting
- RockShox Judy C fork, 63mm travel- plush, extra steering control
- Shimano bottom bracket- dependable bearings
- Shimano Alivio cranks- smooth, accurate shifting, stiff chainrings
- All alloy pedals- strong, durable, good foot support
- Bontrager FS+10 saddle- technical shape with all-day comfort
- ICON alloy handlebars- strong, light, wide for control
- Riser stem- comfortable position
- Bontrager Jones tires- big casing and full knobs for traction, durability, shock absorption

Additionals	2 water bottle mounts (1 on 13")
Colors	Dragonfly Orange/ Red fork • Black decal
	Black Gold/ Red fork • Red decal

Bike sizes	13	16.5	18	19.5	21
Handlebar width	580	580	580	580	580
Handlebar rise	0	0	0	0	0
Stem length	90/25°	110/25°	110/25°	130/25°	130/25°
Crank length	170	170	175	175	175
Seatpost length	300	300	350	350	350
Steerer length	173	173	188	208	228
MM Reach	601	645	663	690	704
Handlebar height	809	820	837	868	885
IN Reach	23.7	25.4	26.1	27.1	27.7
Handlebar height	31.8	32.3	33.0	34.2	34.8

6500 WSD

Our Price $_____

Intensity: Training
Surface types: Singletrack
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	Alpha ZX aluminum
Main tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	RockShox Judy C, soft springs, 65mm
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	Forged alloy direct connect
Bar ends	-
Grips	Bontrager dual density
Shifters	Shimano STX-RC RapidFire+
Front derailleur	Shimano Alivio
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LV30E, short reach direct pull
Crankset	Shimano Alivio 42/32/22
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	IG31, 106 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254 Rear 32° 3x, 264/265 (D/ND)
Saddle	Trek WSD
Seatpost	SP-312 alloy micro-adjust
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	Bontrager Comp I
Rear hub	Bontrager Comp II
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve

- Alpha ZX aluminum frame- Light, strong, singletrack geometry, Hayes mount
- WSD geometry- better performance for women
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking
- DT stainless spokes- strong, light, lasting
- RockShox Judy C fork, 63mm travel- plush, extra steering control
- Shimano bottom bracket- long lasting, dependable bearings
- All alloy pedals- strong, durable, good foot support
- Bontrager Jones tires- big casing and full knobs for traction, durability, shock absorption
- Riser stem- comfortable position

Additionals 2 water bottle mounts (1 on XS)

Colors Dragonfly Orange/ Blue fork • Blue decal

	XS	S	M
Bike sizes			
Handlebar width	560	560	560
Handlebar rise	0	0	0
Stem length	90/25°	110/25°	110/25°
Crank length	170	170	175
Seatpost length	300	300	300
Steerer length	173	173	188
MM Reach	584	612	643
Handlebar height	807	821	835
IN Reach	23.0	24.1	25.3
Handlebar height	31.8	32.3	32.9

6000

Our Price $_____

Intensity: Training
Surface types: Singletrack
Topography: Mountainous
Distance: Extended dirt
Spec level: Competitive

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	RockShox Jett T2, 65mm
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	Forged alloy direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano Alivio RapidFire+
Front derailleur	Shimano Acera-X
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LV77E direct pull
Crankset	Shimano Acera-X 42/32/22
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Resin/alloy cage w/clips, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 106 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 265 Rear 32° 3x, 262/263 (D/ND)
Saddle	Trek Crossbow
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/quick release

Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	IRC Mythos, 26 x 2.1
Rear tire	IRC Mythos, 26 x 2.1
Spokes	15G stainless
Tubes	Presta valve

- Alpha aluminum frame- Light, strong, singletrack geometry
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking
- 32 stainless steel spoked wheels- light and strong
- RockShox Jett T2 fork, 65mm travel- comfort, control
- Shimano LX rear derailleur- smooth, accurate shifting
- Shimano crankset- smooth, quick shifting
- Shimano bottom bracket- dependable bearings
- Bontrager Jones tires- big casing and full knobs for traction, durability, shock absorption
- ICON alloy handlebars- light and strong

Additionals 2 water bottle mounts, rack mounts (1 bottle/no rack on 13)

Colors Inkwell Blue/ Black fork • White decal
Trek Red / Black fork • Black decal

	13	16.5	18	19.5	21	22.5
Bike sizes						
Handlebar width	580	580	580	580	580	580
Handlebar rise	0	0	0	0	0	0
Stem length	90/25°	110/25°	110/25°	130/25°	130/25°	130/25°
Crank length	170	170	175	175	175	175
Seatpost length	300	300	350	350	350	350
Steerer length	173	173	188	208	228	263
MM Reach	594	639	658	683	694	704
Handlebar height	810	818	834	867	886	921
IN Reach	23.4	25.2	25.9	26.9	27.3	27.7
Handlebar height	31.9	32.2	32.8	34.1	34.9	36.3

4000

Our Price $_____

Intensity: Sporty
Surface types: Off road
Topography: Mountainous
Distance: Extended dirt
Spec level: Competitive

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	Cro-Moly, mm
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	Forged alloy direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano Alivio RapidFire+
Front derailleur	Shimano Acera-X
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LV77E, direct pull
Crankset	Shimano Acera-X 42/32/22
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Resin/alloy cage w/clips, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 106 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 265 Rear 32° 3x, 262/263 (D/ND)
Saddle	Trek Crossbow
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/quick release

Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	15G stainless
Tubes	Presta valve

- Alpha aluminum frame- Light, strong, singletrack geometry
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking
- 32 stainless steel spoked wheels- light and strong
- LX rear derailleur- smooth, accurate shifting

Alivio RapidFire shifters- quick and precise gear selection

- Acera crank- 22t small ring for lower gears
- Shimano LP27 bottom bracket- dependable bearings
- Bontrager Jones tires- big casing and full knobs for traction, durability, shock absorption
- ICON alloy handlebars- light and strong

Additionals 2 water bottle mounts, rack mounts (1 bottle/no rack on 13)

Colors Dragonfly Green • White decal
Metallic Ice Red • Silver decal

Bike sizes	13	16.5	18	19.5	21	22.5
Handlebar width	580	580	580	580	580	580
Handlebar rise	0	0	0	0	0	0
Stem length	90/25°	110/25°	110/25°	130/25°	130/25°	130/25°
Crank length	170	170	175	175	175	175
Seatpost length	300	300	350	350	350	350
Steerer length	173	173	188	208	228	268
MM Reach	594	639	658	683	694	704
Handlebar height	816	824	840	873	892	928
IN Reach	23.4	25.2	25.9	26.9	27.3	27.7
Handlebar height	32.1	32.5	33.1	34.4	35.1	36.5

830 AL

Our Price $_____

Intensity: Sporty
Surface types: Off road
Topography: Mountainous
Distance: Local dirt
Spec level: Recreational

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	RST 281, 65mm
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	Forged alloy direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift ESP-500
Front derailleur	Shimano Altus
Rear derailleur	GripShift ESP 5.0
Front brake	Lee Chi MV33 direct pull
Rear brake	Lee Chi MV33 direct pull
Brake levers	Lee Chi LG77E, direct pull
Crankset	Shimano Altus 42/34/24
Bottom bracket	Shimano BB-CT92E, 73 x 121
Pedals	Alloy/alloy cage, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 267 Rear 32° 3x, 264/266 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/quick release

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- Light, strong, singletrack geometry
- Weinmann rims, 32 stainless steel spokes- light and strong
- ESP500 shift system- quick and positive shifting
- 8 speed- more gear selection
- Shimano bottom bracket- dependable bearings
- Bontrager Jones tires- big casing and full knobs for traction, durability, shock absorption
- ICON alloy handlebars- light and strong

Additionals 2 water bottle mounts, rack mounts (1 bottle, no rack on 13)

Colors Dragonfly Orange/ Black fork & decal
Metal Flake Green/ Black fork • Gold decal

Bike sizes	13	16.5	18	19.5	21	22.5
Handlebar width	580	580	580	580	580	580
Handlebar rise	0	0	0	0	0	0
Stem length	90/25°	90/25°	90/25°	110/25°	110/25°	110/25°
Crank length	170	170	170	170	170	170
Seatpost length	300	300	300	350	350	350
Steerer length	178	178	193	213	233	273
MM Reach	594	625	644	668	679	689
Handlebar height	776	775	787	819	838	874
IN Reach	23.4	24.6	25.3	26.3	26.7	27.1
Handlebar height	30.5	30.5	31.0	32.3	33.0	34.4

820 AL

Our Price $_____

Intensity: Sporty
Surface types: Off road
Topography: Mountainous
Distance: Local dirt
Spec level: Recreational

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	Cro-Moly
Headset	VP H992W
Handlebars	Alloy, 5° bend
Stem	ATB
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift ESP-500
Front derailleur	Shimano Altus
Rear derailleur	GripShift ESP 5.0
Front brake	Lee Chi MV33 direct pull
Rear brake	Lee Chi MV33 direct pull
Brake levers	Lee Chi LG77E, direct pull
Crankset	Shimano Altus 42/34/24
Bottom bracket	Shimano BB-CT92E, 73 x 121
Pedals	Platform, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 267 Rear 32° 3x, 264/266 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/quick release

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Trek Connection, 26 x 1.95
Rear tire	Trek Connection, 26 x 1.95
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- Light, strong, singletrack geometry
- Weinmann rims, 32 stainless steel spokes- light and strong
- ESP500 shift system- quick and positive 8 speed shifting
- Direct pull brakes- great stopping power
- Shimano bottom bracket- dependable bearings
- Alloy handlebars- light weight

Bike sizes	13	16.5	18	19.5	21	22.5	17W	20W
Handlebar width	580	580	580	580	580	580	580	610
Handlebar rise	0	0	0	0	0	0	60	60
Stem length	105/55°	105/55°	120/55°	120/55°	135/55°	135/55°	120/55°	120/55°
Crank length	170	170	170	170	170	170	170	170
Seatpost length	300	300	300	350	350	350	300	350
Steerer length	127	127	142	162	182	222	162	182
MM Reach	558	589	612	622	637	647	591	621
Handlebar height	904	898	924	943	976	1012	946	965
IN Reach	22.0	23.2	24.1	24.5	25.1	25.5	23.3	24.5
Handlebar height	35.6	35.4	36.4	37.1	38.4	39.8	37.2	38.0

Additionals	2 water bottle mounts, rack mounts (1 bottle, no rack on 13)
Colors	Trek Red • White decal Black Gold • Red decal

True Temper Cro-Moly steel

True Temper is a US company making high quality steel tubing. We've been working with True Temper for quite some time, enjoying their ability to make custom tubesets to our Engineers specifications. In 1996 we invested in our own butting equipment, so we further manipulate the excellent tubing to make the 3.6 pound 930 an incredible frameset at an incredible value.

The tubesets in these frames are large diameter for rigidity and control. Then we triple butt them. Butting refers to a change in tube wall thickness. Placing more material at the highly stressed junctions of the tubes keeps a frame strong, and removing material where its not needed makes it light. The easiest (and least expensive) butt is a single butt, where one end of the tube is reinforced. Double butting requires different manufacturing techniques, because both ends of a tube have the same reinforcement.

On a bicycle, the area near the head tube sees much higher stresses than the area near the seat tube, and the middle of the tube sees even less stress. Triple butting means that each of these three regions has a specific wall thickness, and any extra material has been pared down. The tubing has been maximized for strength and weight, fully addressing the unique stresses on either end of the tube. Not only does this make the bike lighter, but the thinner walls also make the bike feel lively and shock absorptive.

Geometry

The geometry of the 930 is similar to the Alphas. The aggressive position makes for quick steering response and enhances acceleration and climbing. The tight chainstay configuration provides a smooth transition from a seated position to standing on climbs. These features make the 930 an excellent singletrack bike with a lively feel.

Frame details

The 930 has the full frame package you expect from a Trek. Trick forged dropouts, double water bottles, and rack mounts are all incorporated into the frame design. Careful shaping of the chainstays maximizes tire clearance, while keeping the rear of the bike stiff for excellent power transfer to the rear wheel. Top tube cable routing keeps gunk from slowing the controls.

930 Geometry

Frame size	13	16.5	18	19.5	21	22.5
Head angle	70.5	71.0	71.0	71.0	71.0	71.0
Seat angle	74.0	73.5	73.0	73.0	73.0	72.5
MM						
Standover	647	709	735	764	801	838
Seat tube	330	419	457	495	533	572
Head tube	90	90	105	125	145	185
Eff. top tube	530	560	580	590	600	610
Chainstay	430	430	430	430	430	430
BB height	288	295	298	298	298	300
Fork offset	38	38	38	38	38	38
Trail	79	75	75	75	75	75
Wheelbase	1016	1039	1056	1066	1078	1084
INCH						
Standover	25.5	27.9	28.9	30.1	31.5	33.0
Seat tube	13.0	16.5	18.0	19.5	21.0	22.5
Head tube	3.5	3.5	4.1	4.9	5.7	7.3
Eff. top tube	20.9	22.0	22.8	23.2	23.6	24.0
Chainstay	16.9	16.9	16.9	16.9	16.9	16.9
BB height	11.3	11.6	11.7	11.7	11.7	11.8
Fork offset	1.5	1.5	1.5	1.5	1.5	1.5
Trail	3.1	3.0	3.0	3.0	3.0	3.0
Wheelbase	40.0	40.9	41.6	42.0	42.4	42.7

Mechanic's Specs and Notes for 930

Seatpost diameter	27.2mm
Seatclamp diameter	quick release, no clamp
Headset size	25.4/34.0/30.0
Fork length	415mm
Front derailleur	31.8mm Top pull
Bottom bracket	73mm
Rear hub OLD	135mm
Cable stops	3 cables
Disc brake mount	No
Bottle mounts	2 (1 on 13")
Rack mounts	Yes (no on 13")

930 Parts List

Seatpost QR

General Mechanic's Specs and Notes

The Trek steel ATB frame is designed around a 50mm travel fork.

Trek steel ATB frames are designed to accept 27.2mm seat posts with a tolerance of 27.08 to 27.20mm outer diameter. Measure the seatpost for conformity to this tolerance prior to installation.

Be sure bottom bracket threads are clean and well greased before insertion. Failure to do so may cause galling of the threads.

Triple clamp forks put additional stress on a bike frame applied by extra length and the extra stiffness. For this reason, triple clamp forks should not be put on any Trek other than the '98 and newer dual suspension frames.

800 Series Frame details

The 800 series features robust frames for true off road adventure, but at more popular price points. These frames have large diameter tubesets for rigidity and control. They use 1 1/8" steering systems to compliment the frame's rugged look and attitude, also adding steering control, longer headset bearing life, and better opportunity to upgrade to a suspension fork.

The geometry is slightly more relaxed than the 930 or Alphas. This takes some pressure off the hands and arms of the rider for comfort. These bikes also excel as all-round bikes, being fun to ride on city streets or neighborhood bike paths. The less aggressive geometry requires less input from the rider; they can sit up and check out the scenery. And if they accidentally hit a bump while looking at the flowers, the stability of the steering will help keep them on track.

The relaxed geometry actually helps a less experienced rider cruise easy trails and a casual rider will have lots of fun challenging themselves. The 800s don't have suspension forks, so they're best ridden on trails with fewer, and smaller, obstacles. While they aren't designed for tight maneuvering or high speeds, the upgrades in equipment we've made certainly lend themselves to a more exciting and versatile ride. V Brakes, lower gear ranges, more gears, plus stronger and lighter wheels all add performance to these popular Trek models for '99.

The 800 Sport and 800 feature a frame with Cro-Moly seat tube weighing 5.0 pounds (see Frame Materials, page 6, for more on frame materials). But the important point of the seat tube is that Cro-Moly steel has a higher yield, or resistance to deformation, than Hi-tensile. This is important in the seat tube, where the top of the seat tube may see hundreds, if not thousands, of open-and-close cycles with the high clamping force of the seatpost quick release.

When a rider moves up to the 820, they get a Cro-Moly main triangle, and a Cro-moly fork. This allows us to make the frame both lighter (4.6 pounds), and stronger. Riders who want to push themselves and their bikes a bit will enjoy these benefits.

Please note that some of our competitors list their forks as Cro-Moly, but it may be only the blades. The 820 also uses Cro-Moly in the steerer, which is the highest stressed part of the fork, if not the highest stressed part of the bike.

The 800 series has other quality features you'd expect on a Trek. Even the 800 Sport has the luxury of a rear quick release, but if cheesy dropouts get pushed out of alignment by unskilled use of the quick release, the hub bearings will wear prematurely. The forged dropouts on the 800 Sport are extra strong to resist flex and stay parallel.

The 800 series has full bottle mounts, and also rack mounts. And like all Treks, even the 800 series has to survive our test lab where Engineers, with evil in their hearts, try to tear them down on hydraulic-ram fatigue testers.

When looking at the 800 series, pay attention to some of the subtle points of quality. Our Product Managers have worked in bike shops, and know what this level of riders need, plus they are riders themselves. Even the 800 Sport stands up to close scrutiny. You'll pick up on details like stainless steel spokes. Not only do they look nice, but the rust resistance means that after a few years of riding you'll still be able to turn the nipples to true the wheels. The micro-adjustable alloy seatpost is light, but also allows precise saddle adjustment for increased comfort. Name-brand Weinmann rims are stronger than the "alloy" (no names please) rims used by many of our competitors, so we can build them with 32 spokes instead of 36. With lighter wheels the bike rolls faster, but their extra strength means they need less truing. Add all that to the attention paid to rider position, bearing seals, comfy grips, and easy GripShift shifting, and the 800 series shines as a very competitive value.

820, 800, 800 Sport Geometry

Frame size	13	16.5	18	19.5	21	22.5	24	17W	20W
Head angle	70.0	70.5	70.5	70.5	71.0	71.0	71.0	70.5	70.5
Seat angle	74.0	73.5	73.0	73.0	72.5	72.0	72.0	73.5	73.0
MM									
Standover	638	697	722	754	790	827	863	501	501
Seat tube	330	419	457	495	533	572	610	432	508
Head tube	90	90	90	105	145	185	225	105	145
Eff. top tube	528	545	555	565	575	585	595	542	550
Chainstay	435	435	435	435	435	435	435	435	435
BB height	288	291	291	293	293	295	295	283	283
Fork offset	38	38	38	38	38	38	38	38	38
Trail	82	79	79	79	75	75	75	79	79
Wheelbase	1023	1032	1038	1049	1051	1057	1068	1027	1031
INCH									
Standover	25.1	27.4	28.4	29.7	31.1	32.6	34.0	19.7	19.7
Seat tube	13.0	16.5	18.0	19.5	21.0	22.5	24.0	17.0	20.0
Head tube	3.5	3.5	3.5	4.1	5.7	7.3	8.9	4.1	5.7
Eff. top tube	20.8	21.5	21.9	22.2	22.6	23.0	23.4	21.3	21.7
Chainstay	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1
BB height	11.3	11.5	11.5	11.5	11.5	11.6	11.6	11.1	11.1
Fork offset	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Trail	3.2	3.1	3.1	3.1	3.0	3.0	3.0	3.1	3.1
Wheelbase	40.3	40.6	40.9	41.3	41.4	41.6	42.0	40.4	40.6

Mechanic's Specs and Notes for 820, 800, 800 Sport

Seatpost diameter	27.2mm
Seatclamp diameter	quick release, no clamp
Headset size	25.4/34.0/30.0
Fork length	397mm
Front derailleur	31.8mm
	Down pull
Bottom bracket	68mm
Rear hub OLD	135mm
Cable stops	1 cable on top tube
Disc brake mount	No
Bottle mounts	2 (1 on 13")
Rack mounts	Yes (no on 13")

800 Series Parts List

Seatpost QR

Intensity: Training
Surface types: Singletrack
Topography: Mountainous
Distance: Extended dirt
Spec level: Competitive

930

Our Price $_____

Frameset	True Temper triple butted Cro-Moly
Main tubes	True Temper triple butted Cro-Moly
Stays	Cro-Moly steel
Fork	RockShox Jett T2, 65mm
Headset	Dia-Compe SE-1 Aheadset
Handlebars	ICON Stronghold, 6061, 5° bend
Stem	Forged alloy direct connect
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano STX-RC RapidFire+
Front derailleur	Shimano Alivio
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LV77E direct pull
Crankset	Shimano Alivio 42/32/22
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	IG31, 106 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 28° Radial, 254
	Rear 32° 3x, 264/265 (D/ND)
Saddle	Bontrager FS+10 Comp
Seatpost	SP-312 alloy micro-adjust
Seat binder	Quick release, 45mm
Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	Bontrager Comp I
Rear hub	Bontrager Comp II
Front tire	Bontrager Jones, 49/53
Rear tire	Bontrager Jones, 46/50
Spokes	DT 15G stainless
Tubes	Presta valve

- True Temper triple butted frameset- Light, resilient
- RockShox Jett T2 fork, 65mm - Type II springs for smooth, progressive spring curve
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking, assymetric for stronger rear wheel
- DT spokes- top quality for long wheel life
- STX-RC 8 speed shifters - lots of gears to choose for easy pedaling
- LP27 bottom bracket- dependable bearings
- Direct pull brakes- super stopping power
- Bontrager Jones tires- front/rear tread for traction, large casing for forgiving control
- Bontrager FS10 saddle- good comfort and support in a shape for technical riding
- ICON alloy handlebars- strong, light, 580mm for better control

Additionals 2 water bottle mounts, rack mounts (1 bottle, no rack on 13")

Colors Metal Flake Blue/ Black fork • Silver decal

Pearl White/ Black fork • Red decal

Bike sizes	13	16.5	18	19.5	21	22.5
Handlebar width	580	580	580	580	580	580
Handlebar rise	0	0	0	0	0	0
Stem length	90/25°	110/25°	110/25°	130/25°	130/25°	130/25°
Crank length	170	170	175	175	175	175
Seatpost length	300	300	350	350	350	350
Steerer length	173	173	188	208	228	263
MM Reach	594	639	659	684	694	704
Handlebar height	816	820	836	869	887	923
IN Reach	23.4	25.2	25.9	26.9	27.3	27.7
Handlebar height	32.1	32.3	32.9	34.2	34.9	36.3

820

Intensity: Sporty
Surface types: Off road
Topography: Hilly
Distance: Local dirt
Spec level: Recreational

Our Price $_____

Frameset	Cro-Moly steel
Main tubes	Cro-Moly steel
Stays	High tensile steel
Fork	Cro-Moly
Headset	VP H992W
Handlebars	Steel, 5° bend (Women's 60mm rise)
Stem	ATB
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift Centera
Front derailleur	Shimano Altus
Rear derailleur	Shimano Alivio
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LG77E, direct pull
Crankset	Shimano Altus 42/34/24
Bottom bracket	Shimano BB-CT92E, 68 x 116
Pedals	Alloy/alloy cage , 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 267
	Rear 32° 3x, 264/266 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Quick release, 47mm

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Trek Connection, 26 x 1.95
Rear tire	Trek Connection, 26 x 1.95
Spokes	14G stainless
Tubes	Schraeder valve

- Oversize Cro-Moly main triangle- Stiff for off road handling control
- Cro-Moly fork- strong and light weight
- Weinmann rims, 32 stainless steel spokes- light and strong
- Centera shift system- 8 speed shifting
- Direct pull brakes- great stopping power
- Shimano bottom bracket- dependable bearings

Additionals	2 water bottle mounts, rack mounts (1 bottle on 13, 17W, 20W, no rack on 13)
Colors	Dragonfly Green • White decal
	Inkwell Blue • Silver decal

Bike sizes	13	16.5	18	19.5	21	22.5	24	17W	20W
Handlebar width	580	580	580	580	580	580	580	580	610
Handlebar rise	0	0	0	0	0	0	0	60	60
Stem length	105/55°	105/55°	105/55°	120/55°	135/55°	135/55°	135/55°	120/55°	120/55°
Crank length	170	170	170	170	170	170	170	170	170
Seatpost length	300	300	300	350	350	350	350	300	350
Steerer length	127	127	127	142	182	222	262	142	182
MM Reach	555	573	583	597	612	622	632	574	582
Handlebar height	914	912	912	939	993	1028	1066	949	987
IN Reach	21.9	22.6	23.0	23.5	24.1	24.5	24.9	22.6	22.9
Handlebar height	36.0	35.9	35.9	37.0	39.1	40.5	42.0	37.4	38.8

800

Intensity: Sporty
Surface types: Off road
Topography: Hilly
Distance: Local dirt
Spec level: Recreational

Our Price $_____

Frameset	Hi Tensile steel w/Cro-Moly seat tube
Main tubes	Hi Tensile steel w/Cro-Moly seat tube
Stays	High tensile steel
Fork	High tensile steel, mm
Headset	VP H992W
Handlebars	Steel, 5° bend (Women's 60mm rise)
Stem	ATB
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift ESP-500
Front derailleur	Shimano Altus
Rear derailleur	GripShift ESP 5.0
Front brake	Lee Chi MV33 direct pull
Rear brake	Lee Chi MV33 direct pull
Brake levers	Lee Chi LG77E, direct pull
Crankset	Shimano Altus 42/34/24
Bottom bracket	Shimano BB-CT92E, 68 x 116
Pedals	Platform, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 267
	Rear 32° 3x, 264/266 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Quick release, 47mm

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Trek Connection, 26 x 1.95
Rear tire	Trek Connection, 26 x 1.95
Spokes	14G stainless
Tubes	Schraeder valve

- Oversize main triangle- Stiff for off road handling control
- 1 1/8" steering system- long bearing life, good steering control, suspension fork compatible
- Cro-Moly fork- strong and light weight
- Weinmann rims, 32 stainless steel spokes- light and strong
- 8 speed- more gear selection
- ESP500 shift system- quick and positive shifting
- Direct pull brakes- great stopping power
- Shimano bottom bracket- dependable bearings

Additionals	2 water bottle mounts (1 bottle on 13, 17W, 20W), rack mounts (no rack on 13")
Colors	Pearl Navy • Silver decal
	Metallic Ice Red • Silver decal

Bike sizes	13	16.5	18	19.5	21	22.5	17W	20W	
Handlebar width	580	580	580	580	580	580	580	610	
Handlebar rise	0	0	0	0	0	0	60	60	
Stem length	105/55°	105/55°	105/55°	120/55°	135/55°	135/55°	120/55°	120/55°	
Crank length	170	170	170	170	170	170	170	170	
Seatpost length	300	300	300	350	350	350	300	350	
Steerer length	127	127	127	142	182	222	142	182	
MM Reach	555	573	583	597	612	622	574	582	
Handlebar height	914	912	912	939	993	1028	949	987	
IN Reach	21.9	22.6	23.0	23.5	24.1	24.5	22.6	22.9	
Handlebar height	36.0	35.9	35.9	37.0	39.1	40.5	37.4	38.8	

800 Sport

Our Price $_____

Intensity: Casual
Surface types: Off road
Topography: Hilly
Distance: Local dirt
Spec level: Recreational

Frameset	Hi Tensile steel w/Cro-Moly seat tube
Main tubes	Hi Tensile steel w/Cro-Moly seat tube
Stays	High tensile steel
Fork	High tensile steel, mm
Headset	VP H992W
Handlebars	Steel, 60mm rise
Stem	ATB
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift MRX-170
Front derailleur	Shimano Tourney TY32
Rear derailleur	Shimano Altus GS
Front brake	CS VB965, direct pull
Rear brake	CS VB965, direct pull
Brake levers	Lee Chi LG68, direct pull
Crankset	Shimano Tourney TY30 48/38/28
Bottom bracket	VP-BC55P semi-cartridge, 68 x 122.5
Pedals	Platform, 9/16" axle
Cassette	Shimano HG37 14-28, 7spd
Chain	KMC Z-51, length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 265
	Rear 32° 3x, 262/264 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Bolt, M6 x 50

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT alloy
Rear hub	KT alloy
Front tire	Knobby, 26 x 2.0
Rear tire	Knobby, 26 x 2.0
Spokes	14G stainless
Tubes	Schraeder valve

- Oversize main triangle- Stiff for off road handling control
- 1 1/8" steering system- long bearing lie, good steering control, suspension fork compatible
- Weinmann rims, 32 stainless steel spokes- light and strong
- GripShift 21 speed shifting- easy to learn, positive, wide range
- Direct pull brakes- great stopping power
- Riser bars- comfortable position
- Oasis dual density saddle- plush seating

Bike sizes	13	16.5	18	19.5	21	22.5	17W	20W
Handlebar width	580	580	610	610	610	610	580	610
Handlebar rise	60	60	60	60	60	60	60	60
Stem length	105/50°	105/50°	105/50°	120/50°	135/50°	135/50°	120/50°	120/50°
Crank length	170	170	170	170	170	170	170	170
Seatpost length	300	300	300	350	350	350	300	350
Steerer length	126	126	126	141	181	221	141	181
MM Reach	564	582	592	607	623	633	584	592
Handlebar height	907	906	906	932	985	1021	940	978
IN Reach	22.2	22.9	23.3	23.9	24.5	24.9	23.0	23.3
Handlebar height	35.7	35.7	35.7	36.7	38.8	40.2	37.0	38.5

Additionals 2 water bottle mounts (1 on 13, 17W, 20W), rack mounts (no rack on 13")

Colors Gloss Black • Red decal
Mellow Gold • Red decal
Violet Pearl • Titanium decal

Not all mountain bikes go to the mountains

Mountain bikes have become extremely popular, even by those who don't ride their new bikes in the mountains. Why? Because mountain bikes are fun! Unlike their skinny-tired road counterparts, mountain bikes are stable, tough, and put the rider in a relaxed, upright position. These features are a boon to the casual cyclist. Casual cyclists don't like to be bent over. A traditional racing bike, with drop bars and skinny saddle may be faster or easier to pedal, but there are more reasons to enjoy cycling than pure speed.

Since so many cyclists fit this portrait- they love cycling, but want comfort on their bike over any other feature- we make the Navigator series. An upright position lets them see the countryside, a primary reason for their cycling. An upright position reduces fatigue by taking unwanted pressure off their wrists, arms, and shoulders. With most of the weight on the cyclists derriere, a wide padded saddle is needed. We go the extra mile here by adding springs. Where economically feasible, we also use suspension seatposts to take the edge off bumps that overcome the saddle padding.

Relaxed, but not boring

While we went to great lengths to make the navigator series easy to ride in a casual manner, we didn't forget that cycling is supposed to be exciting, too. The navigator 300, 400, and 500 all use Alpha framesets, making them light and easy to pedal. They make great bikes for light touring, including MS150 rides or centuries. The upright position may not be fast, but the low 4.2 pound frame weight compensates very nicely.

Geometry changes for 99

For 1999, we've taken the suspension seatpost feature a bit further. Since suspension seatposts have a fat upper section which houses the springs, these posts can't be sunk into the frame low enough to accommodate some folks. To allow a reasonable saddle position with these posts, we changed the geometry by shortening the seat tube of a given frame. No other change was made, so a 98 21 still fits like a 99 XL, but the seat tube is more than two inches shorter.

While we were working on the seatpost solution, we also refined other aspects of the Navigators to maximize their ride. We shortened the top tubes a slightly, and dropped the bottom bracket a bit. Combined these put the rider closer to the ground, and in a more upright position. This compliments the casual, fun ride of these bikes. This also drops the standover considerably, so please read the section "Bike Geometry and Fit" on pages 7-8 if you like to size bikes by having the customer straddle the bike.

Spec changes for 99

We also now specify size-specific springs in the suspension seatposts of the Navigators. If a seatpost is a 350mm, it uses an Hard durometer elastomeric spring. If its a 300mm post, its a Medium spring. This optimizes the ride of these bikes.

While we were working on comfort issues, we also added suspension stems with adjustable rise to the navigator 300 and 400. These stems don't offer the travel of a suspension fork on a mountain bike, but it isn't needed. There is far less pressure on the bars of a navigator due to the rider's position, and these bikes most likely will always be ridden on pavement.

Because Navigators won't see dirt, we can also make the Navigators faster and easier to pedal by spec'ing light, smooth tires. The tread profile on these is close to that of a semi-slick, making them fast and quiet, yet offering plenty of traction.

There are many details which compliment the obvious specs of these fun, functional cruising machines. A chain guard allows the cyclist to dress casually. Wide bars make steering powerful and stable. Full rack mounts let the Navigator turn into a great commuter. So the navigators are as versatile as they are comfortable; a great combination!

Navigator Geometry

Frame size	S	M	L	XL	W-M	W-L
Head angle	70.0	70.5	70.5	70.5	70.5	70.5
Seat angle	74.0	73.5	73.0	73.0	73.5	73.0
MM						
Standover	629	679	716	760	595	604
Seat tube	305	368	419	470	368	419
Head tube	90	125	145	185	125	165
Eff. top tube	526	544	557	579	540	548
Chainstay	435	435	435	435	435	435
BB height	287	287	287	287	283	283
Fork offset	38	38	38	38	38	38
Trail	82	79	79	79	79	79
Wheelbase	1021	1032	1042	1064	1026	1031
INCH						
Standover	24.8	26.7	28.2	29.9	23.4	23.8
Seat tube	12.0	14.5	16.5	18.5	14.5	16.5
Head tube	3.5	4.9	5.7	7.3	4.9	6.5
Eff. top tube	20.7	21.4	21.9	22.8	21.3	21.6
Chainstay	17.1	17.1	17.1	17.1	17.1	17.1
BB height	11.3	11.3	11.3	11.3	11.1	11.1
Fork offset	1.5	1.5	1.5	1.5	1.5	1.5
Trail	3.2	3.1	3.1	3.1	3.1	3.1
Wheelbase	40.2	40.6	41.0	41.9	40.4	40.6

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	31.9mm (200- bolt or QR)
Headset size	25.4/34.0/30.0
Fork length	397mm
Front derailleur	34.9mm (200- 31.8mm)
	Down pull
Bottom bracket	73mm
Rear hub OLD	135mm
Cable stops	3 cables
Disc brake mount	No
Bottle mounts	2 (1 on 13")
Rack mounts	Yes (no on 13")

Navigator Parts List

Seatpost QR

Intensity: Casual
Surface types: Dirt pathways
Topography: Hilly
Distance: Local pavement or dirt
Spec level: Recreational

Navigator 500

Our Price $_____

Frameset	7005 T6 TIG aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	RST 802, 40mm
Headset	VP H992W
Handlebars	Alloy, 5° bend, 65mm rise
Stem	Adjustable rise suspension
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano Nexave
Front derailleur	Shimano Nexave
Rear derailleur	Shimano Nexave
Front brake	Shimano Nexave
Rear brake	Shimano Nexave
Brake levers	Integrated brake/shift
Crankset	Shimano Nexave 400 48/38/28, w/chainguard
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Platform, 9/16" axle
Cassette	Shimano HG60-I 11-34, 9spd
Chain	IG31, 108 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 267
	Rear 32° 3x, 264/265 (D/ND)
Saddle	Selle Italia Gel
Seatpost	Polygon shock absorber
Seat binder	Alloy w/quick release
Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	KT W55F
Rear hub	Shimano R080 'Silent Clutch'
Front tire	Trek Connection, 26 x 1.95
Rear tire	Trek Connection, 26 x 1.95
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- Light and stiff
- RST 802 fork, 40mm- comfort and control
- Adjustable rise suspension stem- wide position range adds comfort
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking, assymetric for stronger rear wheel
- Nexave 8 speed shifters- RapidFire shifting with integrated brake levers
- LP27 bottom bracket- dependable bearings
- Nexave V brakes with Modulator- stopping power with with built in control
- Nexave crankset and Megarange cassette- wide range gearing with road gears

Additionals 2 water bottle mounts, rack mounts (1 bottle/no rack on 13), kickstand

Colors Black Gold • Dark Silver decals

Bike sizes	S	M	L	XL	W-M	W-L
Bar width/rise	580/65	580/65	620/65	620/65	620/65	580/65
Stem length	90/45°	90/45°	110/45°	110/45°	110/45°	90/45°
Crank length	170	170	175	175	175	170
Seatpost length	300	300	350	350	300	350
Steerer length	126	161	181	221	129	169
Seatpost spring	M	M	H	H	M	H
MM Reach	564	583	604	626	587	587
Handlebar height	899	934	976	1014	961	976
IN Reach	22.2	22.9	23.8	24.7	23.1	23.1
Handlebar height	35.4	36.8	38.4	39.9	37.8	38.4

Navigator 400

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Hilly
Distance: Local pavement or dirt
Spec level: Recreational

Frameset	7005 T6 TIG aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	Cro-Moly
Headset	VP H913W
Handlebars	Alloy, 5° bend, 60mm rise
Stem	Adjustable rise suspension
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano Nexave RapidFire+
Front derailleur	Shimano Nexave
Rear derailleur	Shimano Nexave
Front brake	Shimano Nexave V
Rear brake	Shimano Nexave V
Brake levers	Integrated brake/shift
Crankset	Shimano Nexave 400 48/38/28, w/chainguard
Bottom bracket	Shimano BB-LP27E, 73 x 113
Pedals	Platform, 9/16" axle
Cassette	Shimano HG60-I 11-34, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 267 Rear 32° 3x, 264/265 (D/ND)
Saddle	Selle Italia Gel
Seatpost	Polygon shock absorber
Seat binder	Alloy w/quick release

Front Rim	Bontrager Corvair
Rear Rim	Bontrager Corvair ASYM
Front hub	KT W55F
Rear hub	Shimano R080 'Silent Clutch'
Front tire	Trek Connection, 26 x 1.95
Rear tire	Trek Connection, 26 x 1.95
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- Light and stiff
- Adjustable rise suspension stem- wide position range adds comfort
- Suspension seatpost and Gel saddle- sofa comfort
- Bontrager Corvair/ASYM rims- welded with less dish for strength, machined for smooth braking, assymetric for stronger rear wheel
- Nexave 8 speed shifters- RapidFire shifting with integrated brake levers
- LP27 bottom bracket- dependable bearings
- Nexave V brakes with Modulator- stopping power with with built in control
- Nexave crankset and Megarange cassette- wide range gearing with road gears

Additionals 2 water bottle mounts, rack mounts (1 bottle/no rack on 13), kickstand

Colors Metal Flake Green • Dark Silver decals

Bike sizes	S	M	L	XL	W-M	W-L
Bar width/rise	610/60	610/60	610/60	610/60	610/65	580/65
Stem length	115/45°	115/45°	115/45°	115/45°	115/45°	90/45°
Crank length	170	170	175	175	175	170
Seatpost length	300	300	350	350	300	350
Steerer length	126	161	181	221	161	201
Seatpost spring	M	M	H	H	M	H
MM Reach	575	594	607	629	590	587
Handlebar height	922	957	980	1018	966	976
IN Reach	22.6	23.4	23.9	24.7	23.2	23.1
Handlebar height	36.3	37.7	38.6	40.1	38.0	38.4

Navigator 300

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Hilly
Distance: Local pavement or dirt
Spec level: Recreational

Frameset	7005 T6 TIG aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	Cro-Moly
Headset	VP H992W
Handlebars	Steel, 60mm rise
Stem	Adjustable rise suspension
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift Centera
Front derailleur	Shimano Altus
Rear derailleur	Shimano Alivio
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LG77E, direct pull
Crankset	Shimano Altus 42/34/24, w/chain guard
Bottom bracket	Shimano BB-CT92E, 73 x 121
Pedals	Platform, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 267 Rear 32° 3x, 264/266 (D/ND)
Saddle	Trek Web Spring
Seatpost	Polygon shock absorber
Seat binder	Alloy w/quick release

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Smooth, 26 x 1.95
Rear tire	Smooth, 26 x 1.95
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- Light and stiff
- Adjustable rise suspension stem- wide position range adds comfort
- Suspension seatpost and spring saddle- sofa comfort
- Weinmann 519 rims with 32 stainless spokes- light, strong wheels
- Centera 8 speed shifters- lots of gears for easy pedaling
- Shimano bottom bracket- dependable bearings
- Direct pull brakes- great stopping power

Additionals 2 water bottle mounts, rack mounts (1 bottle, no rack on 13), kickstand

Colors Pearl Abyss/Gloss Black fade • Dark Silver decals

Bike sizes	S	M	L	XL	W-M	W-L
Bar width/rise	580/60	580/60	610/60	610/60	610/60	580/60
Stem length	115/45°	115/45°	115/45°	115/45°	110/45°	90/45°
Crank length	170	170	170	170	170	170
Seatpost length	300	300	350	350	300	350
Steerer length	126	161	181	221	161	201
Seatpost spring	M	M	H	H	M	H
MM Reach	575	594	607	629	587	587
Handlebar height	917	952	971	1008	951	971
IN Reach	22.6	23.4	23.9	24.7	23.1	23.1
Handlebar height	36.1	37.5	38.2	39.7	37.5	38.2

Navigator 200

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Hilly
Distance: Local pavement or dirt
Spec level: Recreational

Frameset	Hi Tensile steel w/Cro-Moly seat tube
Main tubes	Hi Tensile steel w/Cro-Moly seat tube
Stays	High tensile steel
Fork	High tensile steel
Headset	VP H992W
Handlebars	Steel, 60mm rise
Stem	Adjustable rise
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift MRX-170
Front derailleur	Shimano Tourney TY32
Rear derailleur	Shimano Altus GS
Front brake	CS VB965, direct pull
Rear brake	CS VB965, direct pull
Brake levers	Integrated brake/shift
Crankset	Shimano Tourney TY30 48/38/28
Bottom bracket	TS BB7700, 68 x 124.5
Pedals	Platform, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	KMC Z-51, 110 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 267
	Rear 32° 3x, 264/265 (D/ND)
Saddle	Trek Web Spring
Seatpost	Shock absorber
Seat binder	Quick release

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	Forged alloy suspension
Rear hub	KT alloy
Front tire	Smooth, 26 x 1.9
Rear tire	Smooth, 26 x 1.9
Spokes	14G stainless
Tubes	Schraeder valve

- Oversize main triangle- Impressive looks, steering control
- 1 1/8" steering system- long bearing life, high strength
- Riser bars and adjustable rise stem- adjustable, comfortable position
- Suspension seatpost and spring saddle- sofa comfort
- Weinmann 519 rims with 32 stainless spokes- light, strong wheels
- GripShift 8 speed shifters- lots of gears for easy pedaling
- Direct pull brakes- great stopping power

Additionals 2 water bottle mounts, rack mounts (1 bottle, no rack on 13), kickstand

Colors Mediterranean Blue-Inkwell Blue fade • Dark Silver decal

Bike sizes	S	M	L	XL	W-M	W-L
Bar width/rise	580/50	580/50	600/50	600/50	580/50	600/50
Stem length	90/45°	90/45°	110/45°	110/45°	90/45°	110/45°
Crank length	170	170	170	170	170	170
Seatpost length	300	300	350	350	300	350
Steerer length	125	160	180	220	160	200
Seatpost spring	M	M	H	H	M	H
MM **Reach**	564	583	604	626	579	595
Handlebar height	883	917	954	992	921	977
IN **Reach**	22.2	22.9	23.8	24.7	22.8	23.4
Handlebar height	34.7	36.1	37.6	39.0	36.3	38.5

Who should buy a Trek hybrid?

A better question might be who shouldn't.

If a rider intends to ride rough terrain, anything rougher than pavement or smooth dirt ways, a mountain bike would be better. Or if a person will average more than about 17-18 MPH, they should get a bike with the aerodynamic advantage of dropped bars. For all other riding, a hybrid is the bike of choice.

Many people don't want the aerodynamic position of a traditional road bike. And since aerodynamics don't mean much until the speed goes above about 20MPH, most riders don't really get much benefit from being bent over, anyway. True, a more forward leaning position allows engagement of the large muscle groups, but a hybrid provides leverage through low gearing, so the rider doesn't have to push hard on the pedals to get up hills if they would prefer not to.

And consider this- how many people buy mountain bikes of some performance level, then never ride them in the dirt?

The typical hybrid rider

So the typical hybrid rider can be defined as: Anyone riding smooth surfaces at less than a 17MPH average, who doesn't want a drop-bar position. That's a huge chunk of the cycling public.

The best of both worlds

But that's not surprising when you consider what a hybrid bike is by definition: The best of both the road and mountain bike worlds.

For street riding with mountain bike styling, Trek hybrids are the way to go. They are better designed for street riding than mountain bikes. Here's why:

- 700c wheels roll faster.
- 700c wheels offer a wider selection of tires
- More nimble handling
- Lower bottom brackets, and a lower center of gravity
- Lower bottom brackets, making them easier to get on and off
- Higher hand position and shorter reach for comfort, and visibility
- Full featured performance bikes with 21, 24, or 27 speeds, V brakes, and Alpha models with SRG (suspension ready geometry).
- Low 4.2 pound Alpha frame weight, 4.6 pound frame on 720.

Trek Alpha hybrids

Trek's Alpha hybrid frameset makes the most of this blend of road and mountain technology. By using Alpha frame construction and detailing Trek Alpha hybrids offers a light, snappy feel. Although the tubes are large diameter compared to a steel bike, the stiffness is not so great as our Alpha mountain bikes. And certainly more comfortable than some of the huge-tubed boneshakers built by our competitors.

Alpha hybrid geometry

Frame size	15	17.5	20	22.5
Head angle	70.0	70.5	70.5	71.5
Seat angle	74.0	74.0	73.0	73.0
MM				
Standover	690	732	774	822
Seat tube	381	445	508	572
Head tube	90	105	105	125
Eff. top tube	545	550	564	582
Chainstay	445	445	445	445
BB height	281	281	281	281
Fork offset	50	50	50	50
Trail	74	70	70	64
Wheelbase	1043	1044	1049	1057
INCH				
Standover	27.2	28.8	30.5	32.4
Seat tube	15.0	17.5	20.0	22.5
Head tube	3.5	4.1	4.1	4.9
Eff. top tube	21.5	21.7	22.2	22.9
Chainstay	17.5	17.5	17.5	17.5
BB height	11.1	11.1	11.1	11.1
Fork offset	2.0	2.0	2.0	2.0
Trail	2.9	2.8	2.8	2.5
Wheelbase	41.1	41.1	41.3	41.6

Mechanic's Specs and Notes for Alpha hybrids

Seatpost diameter	27.2mm
Seatclamp diameter	31.9mm
Headset size	25.4/34.0/30.0
Fork length	428mm
Front derailleur	34.9mm
	Top pull
Bottom bracket	73mm
Rear hub OLD	135mm
Cable stops	3 cables
Disc brake mount	No
Bottle mounts	2 (1 on 13")
Rack mounts	Yes (no on 13")

Alpha Hybrid Parts List

Seatpost clamp	961814

Steel hybrid geometry

Frame size	13	15	17	19	21	23	15W	17W	20W
Head angle	70.0	70.0	70.5	70.5	71.5	71.5	70.0	70.5	70.5
Seat angle	74.5	74.0	74.0	73.0	73.0	73.0	74.0	74.0	73.0
MM									
Standover	638	672	706	738	776	821	582	590	599
Seat tube	330	381	432	483	533	584	381	432	508
Head tube	90	90	90	90	100	140	90	120	165
Eff. top tube	540	545	550	560	570	580	545	548	556
Chainstay	445	445	445	445	445	445	445	445	445
BB height	281	281	281	281	281	281	281	281	281
Fork offset	50	50	50	50	50	50	50	50	50
Trail	74	74	70	70	64	64	74	70	70
Wheelbase	1053	1053	1054	1054	1058	1067	1053	1054	1054
INCH									
Standover	25.1	26.5	27.8	29.1	30.6	32.3	22.9	23.2	23.6
Seat tube	13.0	15.0	17.0	19.0	21.0	23.0	15.0	17.0	20.0
Head tube	3.5	3.5	3.5	3.5	3.9	5.5	3.5	4.7	6.5
Eff. top tube	21.3	21.5	21.7	22.0	22.4	22.8	21.5	21.6	21.9
Chainstay	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
BB height	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
Fork offset	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Trail	2.9	2.9	2.8	2.8	2.5	2.5	2.9	2.8	2.8
Wheelbase	41.5	41.5	41.5	41.5	41.7	42.0	41.5	41.5	41.5

Mechanic's Specs and Notes for steel hybrids

Seatpost diameter	27.2mm
Seatclamp diameter	Quick release
Headset size	22.2/30.2/26.4
Fork length	428mm
Front derailleur	31.8mm Down pull
Bottom bracket	68mm
Rear hub OLD	135mm
Cable stops	3 cables
Disc brake mount	No
Bottle mounts	2 (1 on 13")
Rack mounts	Yes (no on 13")

Steel Hybrid Parts List

Seatpost QR

Intensity: Training
Surface types: Dirt pathways
Topography: Hilly
Distance: Race/tour
Spec level: Competitive

7700

Our Price $_____

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	RockShox Ruby Metro, 30mm
Headset	Tange Seiki Passage
Handlebars	Alloy, 5° bend, 65mm rise
Stem	Alloy adjustable rise
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	Shimano Nexave RapidFire+
Front derailleur	Shimano Nexave 401
Rear derailleur	Shimano Nexave
Front brake	Shimano Nexave V
Rear brake	Shimano Nexave V
Brake levers	Integrated brake/shift
Crankset	Shimano Nexave 400 48/38/28
Bottom bracket	Shimano BB-UN52, 73 x 110
Pedals	Shimano SPD M323, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	IG31, 114 length, 3/32"
Rim strips	Velox 16mm
Spoke lengths	Front 20° Radial, 278 Rear 24° 2x, 288/287 (D/ND)
Saddle	Selle Bassano Touring
Seatpost	Polygon shock absorber
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Top Touring, 700 x 35c
Rear tire	Continental Top Touring, 700 x 35c
Spokes	DT Aero, stainless, alloy nips
Tubes	Presta valve

- Alpha aluminum frame- Light, strong, hybrid geometry
- RockShox Ruby Metro fork, 30mm travel- comfort, control
- Rolf wheels- aero, light, less maintenance
- Shimano Nexave cranks and 8 speed cassette- wide range road gearing
- Continental tires- fast, puncture resistant
- SPD 323 pedals- clipless performance, platform comfort

Bike sizes	15	17.5	20	22.5
Bar width/rise	580/65	580/65	580/65	580/65
Stem length	90/45°	110/45°	110/45°	110/45°
Crank length	170	175	175	175
Seatpost length	300	350	350	350
Steerer length	124	139	139	159
Seatpost spring	M	H	H	H
MM Reach	583	597	611	631
Handlebar height	960	999	999	1021
IN Reach	23.0	23.5	24.1	24.8
Handlebar height	37.8	39.3	39.3	40.2

Additionals	2 water bottle mounts, rack mounts
Colors	Graphite Pearl/ Silver fork • Silver decal

7500 SHX

Our Price $_____

Intensity: Training
Surface types: Dirt pathways
Topography: Hilly
Distance: Race/tour
Spec level: Competitive

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	RockShox Ruby Metro, 30mm
Headset	Tange Seiki Passage
Handlebars	Alloy, 5° bend
Stem	Alloy adjustable rise
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift Centera
Front derailleur	Shimano Nexave 401
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LG78, direct pull
Crankset	Shimano Nexave 400 48/38/28
Bottom bracket	Shimano BB-LP27, 73 x 110
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	IG31, 112 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 296 Rear 32° 3x, 293/294 (D/ND)
Saddle	Selle Bassano Touring
Seatpost	Polygon shock absorber
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Fairlane
Rear Rim	Bontrager Fairlane ASYM
Front hub	Bontrager Comp I
Rear hub	Bontrager Comp II
Front tire	Trek Invert II, 700 x 38c
Rear tire	Trek Invert II, 700 x 38c
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- light, Suspension Ready Geometry
- RockShox Ruby Metro fork, 30mm travel- comfort, control
- 1 1/8" steering system- stronger, more rigid for control
- Nexave crankset- 48T big ring gives road gearing
- Alloy handlebars- light and strong
- Bontrager hubs- sealed bearings
- LX rear derailleur- fast shifting, durable
- Bontrager Fairlane rims- light, strong, machined and welded
- ASYM rear rim- less dish, stronger wheel

Additionals 2 water bottle mounts, rack mounts

Colors Metal Flake Green • Silver decal

Bike sizes	15	17.5	20	22.5	25	17.5W	20W
Bar width/rise	580/0	580/0	580/0	580/0	580/0	580/0	580/0
Stem length	110/45°	110/45°	110/45°	110/45°	110/45°	90/45°	110/45°
Crank length	175	175	175	175	175	170	175
Seatpost length	300	350	350	350	350	300	350
Steerer length	124	139	139	159	179	159	179
Seatpost spring	M	H	H	H	H	M	H
MM Reach	591	597	611	631	641	586	600
Handlebar height	901	916	916	938	957	912	954
IN Reach	23.3	23.5	24.1	24.8	25.2	23.1	23.6
Handlebar height	35.5	36.1	36.1	36.9	37.7	35.9	37.6

Intensity: Training
Surface types: Dirt pathways
Topography: Hilly
Distance: Race/tour
Spec level: Competitive

7500

Our Price $_____

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	Cro-Moly
Headset	Tange Seiki Passage
Handlebars	Alloy, 5° bend
Stem	Alloy adjustable rise
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift Centera
Front derailleur	Shimano Nexave 401
Rear derailleur	Shimano Deore LX SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LG78, direct pull
Crankset	Shimano Nexave 400 48/38/28
Bottom bracket	Shimano BB-LP27, 73 x 110
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	IG31, 112 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 32° 3x, 296 Rear 32° 3x, 293/294 (D/ND)
Saddle	Selle Bassano
Seatpost	Polygon shock absorber
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Fairlane
Rear Rim	Bontrager Fairlane ASYM
Front hub	Bontrager Comp I
Rear hub	Bontrager Comp II
Front tire	Trek Invert II, 700 x 38c
Rear tire	Trek Invert II, 700 x 38c
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- light, Suspension Ready Geometry
- 1 1/8" steering system- stronger, more rigid for control
- Nexave crankset- 48T big ring gives road gearing
- Alloy handlebars- light and strong
- Bontrager hubs- sealed bearings
- LX rear derailleur- fast shifting, durable
- Bontrager Fairlane rims- light, strong, machined and welded
- ASYM rear rim- less dish, stronger wheel

Additionals 2 water bottle mounts, rack mounts

Colors Metal Flake Green • Silver decal
Pearl White • Gold decal

Bike sizes	13	15	17.5	20	22.5	15W	17.5W	20W
Bar width/rise	580/65	580/65	580/65	580/65	580/65	580/65	580/65	580/65
Stem length	90/45°	90/45°	110/45°	110/45°	110/45°	90/45°	90/45°	110/45°
Crank length	170	175	175	175	175	175	170	175
Seatpost length	300	300	350	350	350	300	300	350
Steerer length	124	124	139	139	159	139	159	179
Seatpost spring	M	M	H	H	H	M	M	H
MM Reach	621	583	597	611	631	581	586	600
Handlebar height	945	950	984	984	1006	964	980	1022
IN Reach	24.5	23.0	23.5	24.1	24.8	22.9	23.1	23.6
Handlebar height	37.2	37.4	38.7	38.7	39.6	38.0	38.6	40.2

7300

Our Price $_____

Intensity: Sporty
Surface types: Dirt pathways
Topography: Hilly
Distance: Extended
Spec level: Recreational

Frameset	Alpha aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	Cro-Moly
Headset	VP H992W
Handlebars	Steel, 60mm rise
Stem	Alloy adjustable rise
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift Centera
Front derailleur	Shimano Nexave
Rear derailleur	Shimano STX-RC SGS
Front brake	Lee Chi TX22 direct pull
Rear brake	Lee Chi TX22 direct pull
Brake levers	Lee Chi LG78, direct pull
Crankset	Shimano Nexave 301 48/38/28, w/chainguard
Bottom bracket	Shimano BB-CS15, 73 x 122.5
Pedals	Platform, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 112 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 298 Rear 32° 3x, 296/297 (D/ND)
Saddle	Oasis Web Spring
Seatpost	Polygon shock absorber
Seat binder	Alloy w/integral bolt

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT W55F
Rear hub	KT W5ER
Front tire	Trek Invert II, 700 x 38c
Rear tire	Trek Invert II, 700 x 38c
Spokes	14G stainless
Tubes	Schraeder valve

- Alpha aluminum frame- light, Suspension Ready Geometry
- 1 1/8" steering system- stronger, more rigid for control
- Nexave crankset- 48T big ring gives road gearing
- 8 speed- more gears for easier pedaling

* Adjustable rise stem- better comfort, changeable performance

- STX-RC rear derailleur- fast shifting, durable

Additionals 2 water bottle mounts, rack mounts (1 bottle on 15, 17W, 20W)

Colors Inkwell Blue • Silver decal
Metallic Ice Red • Silver decal

Bike sizes	13	15	17.5	20	22.5	15W	17.5W	20W
Bar width/rise	580/60	580/60	580/60	580/60	580/60	600/60	600/60	600/60
Stem length	90/45°	90/45°	110/45°	110/45°	110/45°	90/45°	90/45°	110/45°
Crank length	170	170	170	170	170	170	170	170
Seatpost length	300	300	300	350	350	300	300	350
Steerer length	127	127	142	142	162	142	162	182
Seatpost spring	M	M	M	H	H	M	M	H
MM Reach	621	583	597	611	631	581	586	600
Handlebar height	915	915	948	948	970	929	949	986
IN Reach	24.5	23.0	23.5	24.1	24.8	22.9	23.1	23.6
Handlebar height	36.0	36.0	37.3	37.3	38.2	36.6	37.4	38.8

720

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Rolling
Distance: Local
Spec level: Recreational

Frameset	Cro-Moly steel
Main tubes	Cro-Moly steel
Stays	High tensile steel
Fork	Cro-Moly
Headset	VP H692W
Handlebars	Northroad, 65mm rise
Stem	Alloy adjustable rise
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift Centera
Front derailleur	Shimano Tourney TY32
Rear derailleur	Shimano Alivio
Front brake	Lee Chi MV33 direct pull
Rear brake	Lee Chi MV33 direct pull
Brake levers	Lee Chi LG78, direct pull
Crankset	Shimano Tourney TY30 48/38/28, w/chainguard
Bottom bracket	Shimano Tourney, 68 x 122.5
Pedals	Platform, 9/16" axle
Cassette	Sun Race 11-30, 8spd
Chain	IG31, 112 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 298 Rear 32° 3x, 296/297 (D/ND)
Saddle	Oasis w/springs
Seatpost	Polygon shock absorber
Seat binder	Quick release, 55mm

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT 955F
Rear hub	KT W5ER
Front tire	Trek Invert II, 700 x 38c
Rear tire	Trek Invert II, 700 x 38c
Spokes	14G stainless
Tubes	Schraeder valve

- Cro-Moly main frame and fork- strong and lively ride
- 8 speed- more gears for easier pedaling
- Stainless spokes- strong, corrosion resistant
- Polygon shock absorber seatpost- comfort
- Tourney crankset- 48T big ring gives road gearing

* Adjustable rise stem- better comfort, changeable performance

- 32 spoke wheels- light, yet strong
- STX-RC rear derailleur- fast shifting, durable
- Direct pull brakes- great stopping power

Additionals 2 water bottle mounts, rack mounts (1 bottle on 15, 17W, 20W)

Colors Explorer Green • Silver decal
Graphite Pearl • Silver decal

Bike sizes	13	15	17	19	21	23	15W	17W	20W
Bar width/rise	580/65	580/65	580/65	580/65	580/65	580/65	580/65	580/65	580/65
Stem length	90/45°	90/45°	110/45°	110/45°	110/45°	110/45°	90/45°	90/45°	110/45°
Crank length	170	170	170	170	170	170	170	170	170
Seatpost length	300	300	300	350	350	350	300	300	300
Steerer length	128	128	128	128	138	178	128	158	203
Seatpost spring	M	M	M	H	H	H	M	M	M
MM Reach	578	583	597	607	619	629	583	587	603
Handlebar height	920	916	935	935	947	985	916	945	1011
IN Reach	22.8	23.0	23.5	23.9	24.4	24.8	23.0	23.1	23.8
Handlebar height	36.2	36.0	36.8	36.8	37.3	38.8	36.0	37.2	39.7

700

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Rolling
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel w/Cro-Moly seat tube
Main tubes	Hi Tensile steel w/Cro-Moly seat tube
Stays	High tensile steel
Fork	High tensile steel, mm
Headset	VP H692W
Handlebars	Steel, 65mm rise
Stem	Alloy adjustable rise
Bar ends	-
Grips	Trek Oasis, dual density
Shifters	GripShift MRX-170
Front derailleur	Shimano Tourney TY32
Rear derailleur	Shimano Acera-X
Front brake	CS VB965, direct pull
Rear brake	CS VB965, direct pull
Brake levers	Lee Chi LG68, direct pull
Crankset	Shimano Tourney TY30 48/38/28, chainguard
Bottom bracket	VP-B33W semi-cartridge, 68 x 124.5
Pedals	Platform, 9/16" axle
Cassette	HG72 13-28, 7spd
Chain	KMC Z-51, 112 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 294 Rear 36° 3x, 292/293 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Quick release, 47mm

Front Rim	Weinmann 519 alloy
Rear Rim	Weinmann 519 alloy
Front hub	KT alloy
Rear hub	Quick release cassette
Front tire	Trek Invert II, for dynamo, 700 x 38c
Rear tire	Trek Invert II, for dynamo, 700 x 38c
Spokes	14G stainless
Tubes	Schraeder valve

- Cro-Moly seat tube- adds fatigue resistance to clamp
- 21 speed GripShift- high performance shifting
- Lots of sizes- Better fit
- Stainless spokes- strong, corrosion resistant
- Tourney crankset- 48T big ring gives road gearing

* Adjustable rise stem- better comfort, changeable performance

- Direct pull brakes- great stopping power

Additionals	2 water bottle mounts, rack mounts (1 bottle on 15, 17W, 20W)
Colors	Pearl Blue • Metallic Green decal Silver/Titanium fade • Red decal Ice Inkwell • Silver decal

Bike sizes	15	17	19	21	23	17W	20W
Handlebar width	600	600	600	600	600	600	600
Handlebar rise	30	30	30	30	30	65	65
Stem length	90/25°	105/25°	105/25°	120/25°	120/25°	105/25°	105/25°
Crank length	170	170	170	170	170	170	170
Seatpost length	300	300	350	350	350	300	350
Steerer length	130	130	130	140	180	160	205
MM Reach	609	625	635	657	667	623	631
Handlebar height	884	896	896	918	956	925	967
IN Reach	24.0	24.6	25.0	25.9	26.3	24.5	24.8
Handlebar height	34.8	35.3	35.3	36.2	37.6	36.4	38.1

Isn't an ElekTrek just a quiet motorcycle? If our store sells an ElekTrek, aren't we giving a message that regular bicycles are somehow deficient? And who would pay for such an expensive toy?

Cycling is a popular recreation for thousands of young, healthy people all over the world. Its also a great method of transportation in many areas. For these people, the enjoyment of cycling is based on the exhilaration of speed under their own power, or the wind blowing through their hair (through the vents of their helmets,please!). Its the freedom of easily getting to their destination, on their own route and timetable.

But there are many people who do not have the ability, or the desire, to achieve the fitness enjoyed by the young and healthy. For these people, cycling is limited in both its speed and distance. Without speed, the fun is diminished. Without distance, cycling as transportation becomes less practical.

There are many people who would enjoy cycling if they could. But lets face it; the modern lifestyle doesn't promote cycling fitness to anyone but the young. Still, many people who are past their youth are still capable of exercise given that the activity is fun, and that they are given a little help.

A Trek ElekTrek is the answer. The ElekTrek can allow people to rediscover cycling at its best. With a torque-sensitive assist, it still requires that the rider pedal. But by easily turning their efforts into useable distance, and at speeds that are fun, an Elektrek can return the joy of cycling. If a person can balance and pedal, they can now also be a cyclist with an Elektrek. And enjoy cycling the way we privileged already know.

The ElekTrek uses a very quiet torque-assist system developed by the Yamaha corporation. This drive system has been well proven on other electric bicycles in other countries. Trek has designed and built our own frame, and specified the components. Matched to the proven drive system, the Elektrek is an excellent value. It uses a rechargeable NiCad battery system which will provide assist for approximately 25 kilometers (15 miles). The actual distance depends on how much power is used, so assistance in hilly areas would be slightly shorter. The torque sensitive assist works harder when the cyclists pedals harder. So a hard pedal stroke gets more assist than an easy spin. This means getting up to speed happens easily. And cruising along at an easy pace is an efficient use of battery power. The assist does not extend past 20 MPH, so unsafe cycling speeds are not encouraged.

ElekTrek Geometry

Frame size	M16	L16
Head angle	69.0	69.0
Seat angle	72.0	72.0
MM		
Standover	687	687
Seat tube	400	400
Head tube	125	125
Eff. top tube	568	568
Chainstay	533	533
BB height	286	286
Fork offset	38	38
Trail	87	87
Wheelbase	1153	1153
INCH		
Standover	27.0	27.0
Seat tube	15.7	15.7
Head tube	4.9	4.9
Eff. top tube	22.4	22.4
Chainstay	21.0	21.0
BB height	11.3	11.3
Fork offset	1.5	1.5
Trail	3.4	3.4
Wheelbase	45.4	45.4

Mechanic's Specs and Notes

Seatpost diameter	26.8mm
Seatclamp diameter	Bolt or quick release
Headset size	25.4/34.0/30.0
Fork length	405mm
Front derailleur	-
Bottom bracket	JIS taper, motor driven
Rear hub OLD	130mm
Cable stops	2 cables
Disc brake mount	No
Bottle mounts	1
Rack mounts	Yes

ElekTrek Parts List

Seatpost QR

ElekTrek

Our Price $_____

Intensity: Casual
Surface types: Pavement
Topography: Hilly
Distance: Extended
Spec level: Recreational

Frameset	Cro-Moly steel
Main tubes	Cro-Moly steel
Stays	Cro-Moly steel
Fork	Cro-Moly
Headset	Tange Seiki Passage
Handlebars	System 1, 10° bend alloy, 30mm rise
Stem	System 1 ATB, Cro-Moly
Grips	Shimano Nexus
Shifters	Shimano Nexus
Front brake	Shimano Altus CT92
Rear brake	Shimano IM41 roller
Brake levers	Alloy/alloy 2 finger
Crankset	Sugino XCD, 34T
Bottom bracket	Shimano BB-CT91, 73 x 121
Pedals	Platform, 9/16" axle
Cassette	16
Chain	KMC, length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 266
	Rear 36° 4x, 271/270 (D/ND)
Saddle	Oasis Comfort
Seatpost	Alloy micro-adjust
Seat binder	Quick release, 55mm

Front Rim	Matrix Guru
Rear Rim	Matrix Guru
Front hub	Alloy, sealed
Rear hub	Shimano Nexus 7spd internal
Front tire	C-1110, 26 x 1.5
Rear tire	C-1110, 26 x 1.5
Spokes	DT 14G stainless
Tubes	Schraeder valve

Additionals	1 water bottle mount, rack mounts, chainguard, fenders, kickstand, bat tery charger
Colors	Inkwell Blue • Silver decal

Bike sizes	M16	L16
Handlebar width	580	580
Handlebar rise	30	30
Stem length	135/50°	135/50°
Crank length	170	170
Seatpost length	350	350
Steerer length	163	163
MM Reach	612	612
Handlebar height	941	941
IN Reach	24.1	24.1
Handlebar height	37.1	37.1

Although these bikes are casual bikes in most senses of the word, Trek product managers still treat them seriously. Trek works hard to bring the most technology and function possible to these fun, carefree bikes. Look for performance features like alloy rims, which are light for easy pedaling, but also provide a better braking surface than chromed steel rims used by some of the competition. Stainless spokes are strong, but of equal importance they resist corrosion and allow the wheels to be trued as necessary. We even use alloy seatposts on some models.

Cruiser geometry

Frame size	20	23	17W
Head angle	69.5	69.5	69.5
Seat angle	72.8	72.8	72.8
MM			
Standover	683	727	526
Seat tube	508	584	432
Head tube	155	210	120
Eff. top tube	583	630	560
Chainstay	450	450	450
BB height	275	275	275
Fork offset	58	58	58
Trail	64	64	64
Wheelbase	1105	1155	1080
INCH			
Standover	26.9	28.6	20.7
Seat tube	20.0	23.0	17.0
Head tube	6.1	8.3	4.7
Eff. top tube	23.0	24.8	22.0
Chainstay	17.7	17.7	17.7
BB height	10.8	10.8	10.8
Fork offset	2.3	2.3	2.3
Trail	2.5	2.5	2.5
Wheelbase	43.5	45.5	42.5

Mechanic's Specs and Notes

Seatpost diameter	25.6mm
Seatclamp diameter	Bolt or quick release
Headset size	22.2/32.5/27.0
Fork length	386mm
Front derailleur	-
Bottom bracket	Unthreaded
Rear hub OLD	110mm
Cable stops	2 cables
Disc brake mount	No
Bottle mounts	1
Rack mounts	Yes

Mechanic Notes

Pay particular attention to greasing the threads on cruisers. Because they are part of a casual lifestyle, they are often treated casually. They frequently are left out when it rains, etc. etc.. They may even be ridden in salt water (shudder!). Make sure to grease the stem bolts, seatpost, and stem insertion, as well as axle nuts.

Also remember that cruisers must endure hard play and low maintenance. Make sure all the accessories (like chain guards) are aligned and tightened. Also check the chain tension, as this is part of the braking system on a coaster brake equipped bike.

Town and Country

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Rolling
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel, mm
Headset	HP-665 ST
Handlebars	Cruiser, steel
Stem	Alloy
Grips	Dual density with Cruiser pads
Shifters	GripShift SRT-4.0 for Nexus, right only
Rear brake	Shimano Revo coaster
Crankset	Dotek, 33T
Bottom bracket	VP-B33W,
Pedals	Platform, 9/16" axle
Cassette	20
Chain	KMC 408, 98 length, 1/8"
Rim strips	PVC
Spoke lengths	Front 36° 3x, 265 Rear 36° 3x, 254 (D/ND)
Saddle	Dual spring Cruiser
Seatpost	Steel, chrome plated
Seat binder	Quick release

Front Rim	Alloy
Rear Rim	Alloy
Front hub	Alloy, nutted
Rear hub	Shimano Nexus 4 speed
Front tire	Whitewall, 26 x 2.0
Rear tire	Whitewall, 26 x 2.0
Spokes	14G stainless
Tubes	Schraeder valve

Additionals Kickstand, chainguard

Colors Blue Moon • Black decal

Bike sizes	20	23	17W
Handlebar width	700	700	700
Handlebar rise	132	132	132
Stem length	80/30°	80/30°	80/30°
Crank length	170	170	170
Seatpost length	350	350	350
Steerer length	187	242	152
MM Reach	634	681	611
Handlebar height	977	1029	944
IN Reach	25.0	26.8	24.1
Handlebar height	38.5	40.5	37.2

Intensity: Casual
Surface types: Dirt pathways
Topography: Rolling
Distance: Local
Spec level: Recreational

Cruiser Calypso

Our Price $_____

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel, mm
Headset	HP-665 ST
Handlebars	Cruiser, steel
Stem	Alloy
Grips	Dual density with Cruiser pads
Shifters	GripShift MRX-170, right only
Front derailleur	-
Rear derailleur	Shimano Tourney TY22
Front brake	Tektro 852A cantilever
Rear brake	Tektro 852A cantilever
Brake levers	Alloy 4 finger
Crankset	One piece type, 40T
Bottom bracket	One-piece type,
Pedals	Platform, 1/2" axle
Cassette	HG60 14-28, 6spd
Chain	KMC Z-51, 112 length, 3/32"
Rim strips	PVC
Spoke lengths	Front 36° 3x, 265 Rear 36° 3x, 262/263 (D/ND)
Saddle	Dual spring Cruiser
Seatpost	Alloy
Seat binder	Quick release

Front Rim	Alloy
Rear Rim	Alloy
Front hub	Alloy, nutted
Rear hub	Alloy, nutted
Front tire	Whitewall, 26 x 2.0
Rear tire	Whitewall, 26 x 2.0
Spokes	14G stainless
Tubes	Schraeder valve

Additionals Kickstand, chainguard

Colors Mirror Black • Red decal
Metal Flake Green • White decal

Bike sizes	20	23	17W
Handlebar width	700	700	700
Handlebar rise	132	132	132
Stem length	80/30°	80/30°	80/30°
Crank length	165	165	165
Seatpost length	350	350	350
Steerer length	190	245	155
MM Reach	634	681	611
Handlebar height	977	1029	944
IN Reach	25.0	26.8	24.1
Handlebar height	38.5	40.5	37.2

Cruiser Classic

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Flat
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel, mm
Headset	HP-665 ST
Handlebars	Cruiser, steel
Stem	Alloy
Grips	Cruiser
Front brake	-
Rear brake	Shimano coaster
Brake levers	-
Crankset	One piece type, 40T
Bottom bracket	One-piece type,
Pedals	Platform, 1/2" axle
Cassette	18
Chain	KMC 410, 102 length, 1/8"
Rim strips	PVC
Spoke lengths	Front 36° 3x, 265 Rear 36° 3x, 261 (D/ND)
Saddle	Dual spring Cruiser
Seatpost	Alloy
Seat binder	Bolt

Front Rim	Alloy
Rear Rim	Alloy
Front hub	Alloy, nutted
Rear hub	Shimano coaster
Front tire	Whitewall, 26 x 2.0
Rear tire	Whitewall, 26 x 2.0
Spokes	14G stainless
Tubes	Schraeder valve

Additionals Kickstand, chainguard

Colors Ice Royal Blue • White decal
Ice Red • White decal

Bike sizes	20	23	17W
Handlebar width	700	700	700
Handlebar rise	132	132	132
Stem length	80/30°	80/30°	80/30°
Crank length	165	165	165
Seatpost length	350	350	350
Steerer length	187	242	152
MM **Reach**	634	681	611
Handlebar height	977	1029	944
IN **Reach**	25.0	26.8	24.1
Handlebar height	38.5	40.5	37.2

The Maillot Jaune

In the 1998 Tour de France, the entire US Postal team was able to finish, and with an excellent overall team placing. We'd like to thank them for their excellent performance. George, you were so close to Yellow!

We'd like to think at least part of the Postal team success was the 2.44 pound Trek OCLV framesets they rode. For the time trial sages, our R&D team made the team custom welded aluminum machines, since the UCI ruled Trek Y Foils to be an unfair advantage.

Is Trek's OCLV frame an unfair advantage?

The Trek OCLV frames are quick and agile, making them ideal for riding in the tight professional peloton. While stable enough for long Tour stages, they still respond very quickly to rider input. These frames are sensitive to weight shifts, so a racer can respond intuitively to situations as they happen. This sensitivity also lets the bike work with the rider in hard sprints and climbing efforts, helping the rider develop power as they rock the bike back and forth.

Although the carbon frame damps vibration, there is still excellent road feel. Knowing what your wheels are doing is really important to the pros. When they've got a knee out, leaning into the apex of a turn in the Alps at 50MPH, they need to feel their tires hooking up.

The comfort offered by an OCLV frame also leaves them less fatigued after a 250km stage. Of course, if they are a bit fresher in the sprint it may be they're working less on the climbs. After all, the Trek OCLV is the lightest frameset in the peloton.

OCLV Road Geometry

Frame size	50	52	54	56	58	60	62
Head angle	72.0	72.5	73.0	73.8	73.8	74.0	74.0
Seat angle	75.0	75.0	74.0	73.5	73.0	73.0	72.5
MM							
Standover	749	759	773	793	811	830	848
Seat tube	500	520	540	560	580	600	620
Head tube	97	97	104	121	140	159	177
Eff. top tube	518	528	545	560	570	580	590
Chainstay	408	408	410	410	412	412	412
BB height	266	266	266	268	268	268	268
Fork offset	47	47	47	43	43	43	43
Trail	61	58	55	54	54	53	53
Wheelbase	977	980	985	988	996	1003	1008
INCH							
Standover	29.5	29.9	30.4	31.2	31.9	32.7	33.4
Seat tube	19.7	20.5	21.3	22.0	22.8	23.6	24.4
Head tube	3.8	3.8	4.1	4.8	5.5	6.3	7.0
Eff. top tube	20.4	20.8	21.5	22.0	22.4	22.8	23.2
Chainstay	16.1	16.1	16.1	16.1	16.2	16.2	16.2
BB height	10.5	10.5	10.5	10.6	10.6	10.6	10.6
Fork offset	1.9	1.9	1.9	1.7	1.7	1.7	1.7
Trail	2.4	2.3	2.1	2.1	2.1	2.1	2.1
Wheelbase	38.5	38.6	38.8	38.9	39.2	39.5	39.7

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	35.0mm
Headset size	22.2/30.2/26.4
Fork length	370mm
Front derailleur	Braze-on Down pull
Bottom bracket	68mm
Rear hub OLD	130mm
Cable stops	Open top tube brake cable Down tube shift bosses
Bottle mounts	2
Rack mounts	Yes

OCLV Road Parts List	Part #
Chainkeeper	T83663
Chainstay guard	T950130
Front derailleur braze-on plate (OCLV)	T973749
OCLV bottom bracket cable guide	T942820
Brake nut for rear yoke	950112

Trek road bikes are designed to accept 27.2mm seat posts with a tolerance of 27.10 to 27.20mm outer diameter. Measure the seatpost for conformity to this tolerance prior to installation.

For seat post binder bolts, tighten to 85-125 lb•in (9.6-14.1 Nm).

With OCLV frames, do not grease the seatpost. OCLV bikes have a fiberglass sleeve bonded into their carbon seat tube. This sleeve prevents galvanic corrosion of the seatpost and carbon, so no grease is needed, nor recommended. If grease is applied, it may be very difficult to get adequate clamping force to hold the seatpost. If you have accidentally greased an OCLV frame, use a cloth with some degreaser to remove the grease, using normal caution to protect bearings and paint.

Bottom bracket

Be sure bottom bracket threads are clean and well greased before insertion. Failure to do so may cause galling of the threads

Brake nuts

With OCLV bikes and the Air Rail carbon fork, the large diameter used to add stiffness means a normal brake bolt may not be long enough.

Chainkeepers and Chainstay guards

OCLV road frames (except the Y Foils) must always be fitted with a chainkeeper and chainstay guard to protect against damage in case of chainsuck or overshifting past the inner chainring.

Removing Headset Cups

When removing an headset in an OCLV frame, make sure the headset removal tool is engaging the headset cup. OCLV framesets do not utilize a continuous headtube, but instead use two short inserts to support the headset cups. If the headset tool is outside the insert rather than inside the insert and pressing on the cup, frame damage can result.

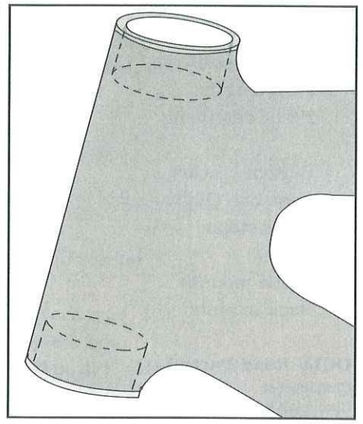


Fig. 26

Intensity: Pro
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Professional

5500

Our Price $_____

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail
Headset	Cane Creek Aheadset
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Havana, direct connect
Grips	ICON Powercork
Shifters	Shimano Dura-Ace STI
Front derailleur	Shimano Dura-Ace
Rear derailleur	Shimano Dura-Ace
Front brake	Shimano Dura-Ace
Rear brake	Shimano Dura-Ace
Brake levers	Integrated brake/shift
Crankset	Shimano Dura-Ace 53/39
Bottom bracket	Shimano Ultegra, 68 x 109.5
Pedals	Shimano Dura-Ace SPD-R, 9/16" axle
Cassette	Shimano Dura-Ace 12-23, 9spd
Chain	Shimano Dura-Ace, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 14° Radial, 280 Rear 16° 1x, 286/284 (D/ND)
Saddle	Giro Fi'zi:k Pave, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector Pro
Front hub	Rolf/ Hugi
Rear hub	Rolf/ Hugi
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Blade, locking alloy nips
Tubes	Presta valve, 48mm stem

- OCLV carbon composite frameset- raced as stock frameset in Tour de France!
- ICON Air Rail fork- laterally rigid, yet comfortable
- Dura-Ace group, including pedals- full Professional race performance
- Rolf Vector Pro wheels- very fast, durable
- Continental Grand Prix 3000 tires- super fast, hard wearing
- ICON seatpost, bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Black Gold • Silver decal
USPS - frameset only

Bike sizes	50	52	54	56	58	60	62
Handlebar width	400	400	420	420	440	440	460
Stem length	60/0°	80/0°	80/0°	100/0°	100/0°	120/0°	120/0°
Crank length	170	170	172.5	172.5	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	181	181	188	205	224	243	261
MM **Reach**	575	604	622	656	666	695	705
Handlebar height	766	773	782	803	824	848	865
IN **Reach**	22.6	23.8	24.5	25.8	26.2	27.4	27.8
Handlebar height	30.1	30.4	30.8	31.6	32.4	33.4	34.1

5200D

Our Price $_____

Intensity: Pro
Surface types: Pavement
Topography: Rolling
Distance: Race/tour
Spec level: Professional

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail
Headset	Tange Seiki Vantage DL
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano Ultegra STI Flite Deck compatible
Front derailleur	Shimano Ultegra
Rear derailleur	Shimano Ultegra
Front brake	Shimano Ultegra
Rear brake	Shimano Ultegra
Brake levers	Integrated brake/shift
Crankset	Shimano Ultegra 53/39
Bottom bracket	Shimano Ultegra, 68 x 109.5
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano Ultegra 12-25, 9spd
Chain	Shimano HG92, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 18° Radial, 270 Rear 20° 2x, 290/288 (D/ND)
Saddle	Giro Fi'zi:k Pave, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector Comp
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Aero stainless, alloy nips
Tubes	Presta valve, 48mm stem

- OCLV carbon composite frameset- raced as stock frameset in Tour de France!
- ICON Air Rail fork- laterally rigid, yet comfortable
- Ultegra group- 9 speed
- Rolf Vector Comp wheels- very fast, durable
- Continental Grand Prix 3000 tires- super fast, hard wearing
- ICON seatpost, bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Pearl White • Red decal
Metal Flake Blue

Bike sizes	50	52	54	56	58	60	62
Handlebar width	400	400	420	420	440	440	460
Stem length	60/-17°	80/-17°	80/-17°	100/-17°	100/-17°	120/-17°	120/-17°
Crank length	170	170	172.5	172.5	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	142	142	150	167	185	204	223
MM Reach	578	608	625	660	670	700	710
Handlebar height	778	779	789	804	825	843	860
IN Reach	22.8	23.9	24.6	26.0	26.4	27.6	28.0
Handlebar height	30.6	30.7	31.1	31.7	32.5	33.2	33.9

5200T

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail
Headset	Tange Seiki Vantage DL
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano Ultegra STI Flite Deck compatible
Front derailleur	Shimano Ultegra T
Rear derailleur	Shimano Ultegra GS
Front brake	Shimano Ultegra
Rear brake	Shimano Ultegra
Brake levers	Integrated brake/shift
Crankset	Shimano Ultegra 52/42/30
Bottom bracket	Shimano Ultegra, 68 x 118
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano Ultegra 12-25, 9spd
Chain	Shimano HG92, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 18° Radial, 270 Rear 20° 2x, 290/288 (D/ND)
Saddle	Giro Fi'zi:k Pave, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector Comp
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Aero stainless, alloy nips
Tubes	Presta valve, 48mm stem

- OCLV carbon composite frameset- raced as stock frameset in Tour de France!
- ICON Air Rail fork- laterally rigid, yet comfortable
- Ultegra group with triple- low gears for the mountains
- Rolf Vector Comp wheels- very fast, durable
- Continental Grand Prix 3000 tires- super fast, hard wearing
- ICON seatpost, bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Pearl White • Red decal
Metal Flake Blue

Bike sizes	50	52	54	56	58	60	62
Handlebar width	400	400	420	420	440	440	460
Stem length	60/0°	80/0°	80/0°	100/0°	100/0°	120/0°	120/0°
Crank length	170	170	172.5	172.5	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	142	142	150	167	185	204	223
MM Reach	575	604	622	656	666	695	705
Handlebar height	795	802	812	833	854	878	896
IN Reach	22.6	23.8	24.5	25.8	26.2	27.4	27.8
Handlebar height	31.3	31.6	32.0	32.8	33.6	34.6	35.3

5000D

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Competitive

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail
Headset	Tange Seiki Passage DX, alloy
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano 105 STI Flite Deck compatible
Front derailleur	Shimano 105
Rear derailleur	Shimano 105
Front brake	Shimano 105
Rear brake	Shimano 105
Brake levers	Integrated brake/shift
Crankset	Shimano 105 53/39
Bottom bracket	Shimano 105, 68 x 109.5
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano HG70 12-25, 9spd
Chain	Shimano HG72, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 20° Radial, 278 Rear 24° 2x, 288/287 (D/ND)
Saddle	Selle Italia Sphere, manganese/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Super Sport, 700 x 25c
Rear tire	Continental Super Sport, 700 x 25c
Spokes	DT 14/15G butted stainless
Tubes	Presta valve

- OCLV carbon composite frameset- raced as stock frameset in Tour de France!
- ICON Air Rail fork- laterally rigid, yet comfortable
- 105 group- 9 speed!
- Rolf Vector wheels- fast, low maintenance
- Continental tires- hard wearing
- ICON seatpost, bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Trek Red • Silver decal

Bike sizes	50	52	54	56	58	60	62
Handlebar width	400	400	420	420	440	440	460
Stem length	60/-17°	80/-17°	80/-17°	100/-17°	100/-17°	120/-17°	120/-17°
Crank length	170	170	172.5	172.5	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	144	144	151	168	187	206	224
MM Reach	578	608	625	660	670	700	710
Handlebar height	780	781	791	806	827	844	862
IN Reach	22.8	23.9	24.6	26.0	26.4	27.6	28.0
Handlebar height	30.7	30.7	31.1	31.7	32.5	33.2	33.9

5000T

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail
Headset	Tange Seiki Passage DX, alloy
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano 105 STI Flite Deck compatible
Front derailleur	Shimano 105 T
Rear derailleur	Shimano 105 GS
Front brake	Shimano 105
Rear brake	Shimano 105
Brake levers	Integrated brake/shift
Crankset	Shimano 105 52/42/30
Bottom bracket	Shimano 105, 68 x 118
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano HG70 12-25, 9spd
Chain	Shimano HG72, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 20° Radial, 278 Rear 24° 2x, 288/287 (D/ND)
Saddle	Selle Italia Sphere, manganese/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Super Sport, 700 x 25c
Rear tire	Continental Super Sport, 700 x 25c
Spokes	DT 14/15G butted stainless
Tubes	Presta valve

- OCLV carbon composite frameset- raced as stock frameset in Tour de France!
- ICON Air Rail fork- laterally rigid, yet comfortable
- 105 group with triple- 27 gears for any terrain
- Rolf Vector wheels- fast, low maintenance
- Continental tires- hard wearing
- ICON seatpost, bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Trek Red • Silver decal

Bike sizes	50	52	54	56	58	60	62
Handlebar width	400	400	420	420	440	440	460
Stem length	60/0°	80/0°	80/0°	100/0°	100/0°	120/0°	120/0°
Crank length	170	170	170	170	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	144	144	152	168	187	206	224
MM Reach	575	604	622	656	666	695	705
Handlebar height	797	804	812	833	856	880	897
IN Reach	22.6	23.8	24.5	25.8	26.2	27.4	27.8
Handlebar height	31.4	31.7	32.0	32.8	33.7	34.6	35.3

Y Foil

Road racing vs. Racing yourself

Not everyone who goes fast on a road bike enjoys the challenges of road racing. Some people prefer to race against the clock, contre-la-montre, time trial style. Triathletes, for instance, are not allowed to draft at all, and they certainly can't ride in tight packs. Some people don't like the competitive scene, preferring instead to challenge themselves alone. Others don't feel the need to be competitive but still like to go as fast as possible.

And then there's the rider who challenges themselves by finishing the ride, not focussing on who they beat. Some of these folks set the goal posts pretty high by doing century rides, or even going longer.

Y Foil benefits

For all these folks, the Y Foil is a great bike. Its slippery shape lets it slice through the wind. Whether the stopwatch is running or not, we can all enjoy the benefits of being more efficient.

Efficiency on a bike means both more speed and reduced fatigue. On a Y Foil, there are two ways a rider can be more efficient. One of them is through aerodynamics, and the Y Foil's reduced drag. The other is through the suspension of the beam. Almost imperceptible, the slight movement of the OCLV frame allows the Y Foil to smooth the road, dispersing shock. When the frame is taming the vibration and shock of the road, the rider's body can be more relaxed. Their muscles aren't called on to stabilize their mass when the road is shaking the wheels. And since the backbone is connected to the leg bone, less back fatigue means less fatigue of the motor. With suspension, the rider's energy can be focused on going faster or longer, or both.

While the seat boom of the Y Foil is slightly flexible, the bottom bracket is not. Its very rigid, so the power transmission to the rear wheel is very positive. Stand on the pedals, and the Y Foil delivers with rock solid pedal strokes.

Y Foil Geometry

Frame size	48	51	54	56	59	62
Head angle	72.0	72.5	73.0	73.5	74.0	74.0
Seat angle	74.5	73.8	73.3	72.0	72.0	72.0
MM						
Standover	727	744	750	769	797	880
Seat tube	480	510	540	560	590	620
Head tube	85	85	85	102	125	155
Eff. top tube	510	527	545	565	585	605
Chainstay	408	408	410	410	412	412
BB height	264	264	266	266	268	268
Fork offset	47	47	47	43	43	43
Trail	61	58	55	56	53	53
Wheelbase	961	967	979	978	996	1015
INCH						
Standover	28.6	29.3	29.5	30.3	31.4	34.6
Seat tube	18.9	20.1	21.3	22.0	23.2	24.4
Head tube	3.3	3.3	3.3	4.0	4.9	6.1
Eff. top tube	20.1	20.7	21.5	22.2	23.0	23.8
Chainstay	16.1	16.1	16.1	16.1	16.2	16.2
BB height	10.4	10.4	10.5	10.5	10.6	10.6
Fork offset	1.9	1.9	1.9	1.7	1.7	1.7
Trail	2.4	2.3	2.1	2.2	2.1	2.1
Wheelbase	37.8	38.1	38.5	38.5	39.2	40.0

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	35.0mm
Headset size	22.2/30.2/26.4
Fork length	402mm
Front derailleur	Braze-on
	Down pull
Bottom bracket	68mm
Rear hub OLD	130mm
Cable stops	3 (closed brake cable)
Bottle mounts	2 (1 frame, 1 seatpost)
Rack mounts	Yes

Y Foil Parts List	**Part #**
Front derailleur braze-on plate	T973749
Y Foil bottom bracket cable guide	980254
Seatpost waterbottle mount	67328
Brake nut for ICON Air Rail fork	950112
Brake nut for rear yoke on Y Foil	980285

The Y Foil is designed to accept 27.2mm seat posts with a tolerance of 27.10 to 27.20mm outer diameter. Measure the seatpost for conformity to this tolerance prior to installation.

With OCLV frames, do not grease the seatpost. OCLV bikes have a fiberglass sleeve bonded into their carbon seat tube. This sleeve prevents galvanic corrosion of the seatpost and carbon, so no grease is needed, nor recommended. If grease is applied, it may be very difficult to get adequate clamping force to hold the seatpost. If you have accidentally greased an OCLV frame, use a cloth with some degreaser to remove the grease, using normal caution to protect bearings and paint.

Bottom bracket

Be sure bottom bracket threads are clean and well greased before insertion. Failure to do so may cause galling of the threads

Brake nuts

With OCLV bikes and the Air Rail carbon fork, the large diameter used to add stiffness means a normal brake bolt may not be long enough. For these forks, we supply a longer nut.

Suspension Ready Geometry

A longer version of the Air Rail is found on the aerodynamic Y Foils. These forks are longer to handle properly in the suspension ready geometry.

Removing Headset Cups

When removing an headset in an OCLV frame, make sure the headset removal tool is engaging the headset cup. OCLV framesets do not utilize a continuous headtube, but instead use two short inserts to support the headset cups. If the headset tool is outside the insert rather than inside the insert and pressing on the cup, frame damage can result.

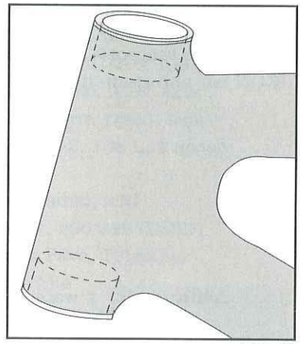


Fig. 27

Velox handlebar plugs

With 'standard' diamond-type bicycle frames, if the front wheel is spun violently, like in a crash, the handlebar can dent the top tube sufficiently to render the frame unsafe to ride.

With the Y Foil's wing-shaped frame, there isn't a top tube. Instead there is a broad, flat surface which the sharp end of the handlebar will contact if the headset is spun. The blow of the sharp handlebar end can be like a punch and hammer, damaging the frame in much the same manner as with a diamond frame. However, chance of frame damage can be greatly reduced by using a thick rubber bumper like the Velox handlebar plug we specify on these bikes. We recommend that Velox handlebar plugs, or similar protection, always be used on Y Foil frames.

Y Foil 77

Our Price $_____

Intensity: Pro
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Professional

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail SRG
Headset	Cane Creek Aheadset
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Havana, direct connect
Grips	ICON Powercork w/Velox rubber plugs
Shifters	Shimano Dura-Ace STI
Front derailleur	Shimano Dura-Ace
Rear derailleur	Shimano Dura-Ace
Front brake	Shimano Dura-Ace
Rear brake	Shimano Dura-Ace
Brake levers	Integrated brake/shift
Crankset	Shimano Dura-Ace 53/39
Bottom bracket	Shimano Ultegra, 68 x 109.5
Pedals	Shimano Dura-Ace SPD-R, 9/16" axle
Cassette	Shimano Dura-Ace 12-23, 9spd
Chain	Shimano Dura-Ace, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 14° Radial, 280 Rear 16° 1x, 286/284 (D/ND)
Saddle	Giro Fi'zi:k Pave, Ti/leather
Seatpost	Thomson Elite
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector Pro
Front hub	Rolf/ Hugi
Rear hub	Rolf/ Hugi
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Blade, locking alloy nips
Tubes	Presta valve, 48mm stem

- OCLV carbon composite frameset- aero, light, laterally rigid, suspension ready

ICON Air Rail fork- laterally rigid, yet comfortable

- Dura-Ace group, including pedals- full Professional race performance
- Rolf Vector Pro wheels- very fast, durable
- Continental Grand Prix 3000 tires- super fast, hard wearing
- Thomson seatpost- low weight, high strength

ICON bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Metal Flake Blue • Red decals

Bike sizes	48	51	54	56	59	62
Handlebar width	400	400	420	420	440	460
Stem length	60/0°	80/0°	90/0°	100/0°	120/0°	120/0°
Crank length	170	170	172.5	172.5	175	175
Seatpost length	250	250	250	250	250	250
Steerer length	169	169	169	186	209	239
MM **Reach**	567	603	631	661	700	720
Handlebar height	787	794	798	818	846	875
IN **Reach**	22.3	23.8	24.8	26.0	27.6	28.4
Handlebar height	31.0	31.2	31.4	32.2	33.3	34.5

Y Foil 66D

Our Price $_____

Intensity: Pro
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Professional

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail SRG
Headset	Tange Seiki Vantage DL
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork w/Velox rubber plugs
Shifters	Shimano Ultegra STI Flite Deck compatible
Front derailleur	Shimano Ultegra
Rear derailleur	Shimano Ultegra
Front brake	Shimano Ultegra
Rear brake	Shimano Ultegra
Brake levers	Integrated brake/shift
Crankset	Shimano Ultegra 53/39
Bottom bracket	Shimano Ultegra, 68 x 109.5
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano Ultegra 12-25, 9spd
Chain	Shimano HG92, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 18° Radial, 270 Rear 20° 2x, 290/288 (D/ND)
Saddle	Giro Fi'zi:k Pave, Ti/leather
Seatpost	Thomson Elite
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector Comp
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Aero stainless, alloy nips
Tubes	Presta valve, 48mm stem

- OCLV carbon composite frameset- aero, light, laterally rigid, suspension ready
- ICON Air Rail fork- laterally rigid, yet comfortable
- Ultegra group- 9 speed
- Rolf Vector Comp wheels- very fast, durable
- Continental Grand Prix 3000 tires- super fast, hard wearing
- Thomson seatpost- low weight, high strength
- ICON bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Trek Red • White decals

Bike sizes	48	51	54	56	59	62
Handlebar width	400	400	420	420	440	460
Stem length	60/-17°	80/-17°	90/-17°	100/-17°	120/-17°	120/-17°
Crank length	170	170	172.5	172.5	175	175
Seatpost length	250	250	250	250	250	250
Steerer length	131	131	131	148	171	201
MM **Reach**	570	607	635	665	705	725
Handlebar height	799	800	801	818	841	870
IN **Reach**	22.4	23.9	25.0	26.2	27.8	28.5
Handlebar height	31.5	31.5	31.6	32.2	33.1	34.3

Y Foil 66T

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Frameset	OCLV carbon fiber composite
Main tubes	OCLV carbon fiber composite
Stays	OCLV carbon
Fork	ICON Air Rail SRG
Headset	Tange Seiki Vantage DL
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork w/Velox rubber plugs
Shifters	Shimano Ultegra STI Flite Deck compatible
Front derailleur	Shimano Ultegra T
Rear derailleur	Shimano Ultegra GS
Front brake	Shimano Ultegra
Rear brake	Shimano Ultegra
Brake levers	Integrated brake/shift
Crankset	Shimano Ultegra 52/42/30
Bottom bracket	Shimano Ultegra, 68 x 118
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano Ultegra 12-25, 9spd
Chain	Shimano HG92, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 18° Radial, 270 Rear 20° 2x, 290/288 (D/ND)
Saddle	Giro Fi'zi:k Pave, Ti/leather
Seatpost	Thomson Elite
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector Comp
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT 14/15G butted stainless
Tubes	Presta valve, 48mm stem

- OCLV carbon composite frameset- aero, light, laterally rigid, suspension ready
- ICON Air Rail fork- laterally rigid, yet comfortable
- Ultegra 27 speed group- lower gears with 9 speed
- Rolf Vector Comp wheels- very fast, durable
- Continental Grand Prix 3000 tires- super fast, hard wearing
- Thomson seatpost- low weight, high strength
- ICON bar and stem- light and strong

Additionals 2 water bottle mounts

Colors Trek Red • White decals

Bike sizes	48	51	54	56	59	62
Handlebar width	400	400	420	420	440	460
Stem length	60/0°	80/0°	90/0°	100/0°	120/0°	120/0°
Crank length	170	170	172.5	172.5	175	175
Seatpost length	250	250	250	250	250	250
Steerer length	131	131	131	148	171	201
MM Reach	567	603	631	661	700	720
Handlebar height	816	823	828	848	876	905
IN Reach	22.3	23.8	24.8	26.0	27.6	28.4
Handlebar height	32.1	32.4	32.6	33.4	34.5	35.6

Welded road bikes

Trek has been building aluminum road bikes since 1986. Although this was about the point where most companies dropped their emphasis on road bikes to take advantage of the mountain bike boom, Trek never lost their enthusiasm for skinny tires. Frame technology continued to grow at Trek with the introduction in 1987 of the model 2500 which used carbon fiber composite tubes in the main triangle. In 1992, again Trek introduced new frame technology with OCLV road bikes. For years we claimed that the manufacturing process used to make these frames, bonding, made them a superior product. Our bonding process allowed us to use thin-walled aluminum tubing (or carbon composite) for a great ride, yet keep perfect alignment of the frame by avoiding heat distortion.

Over the years, welding technology has greatly advanced. And like our involvement in all phases of the bike industry, we've been watching, learning, and growing. We started welding bikes in 1994, and brought aluminum welding to Trek mountain bikes (the Y bike rear triangle) the following year. In 1998 we built a majority of Trek mountain bikes by welding framesets we call Alpha.

What we said about bonding is still true today. We still use our Advanced Bonding Technology to build OCLV road bikes and Y Foils. But in 1999 our ability to weld thin walled aluminum and successfully heat treat frames to high precision allows us to bring Alpha frames to our family of road bikes. And for 1999, you'll immediately see one of the advantages of Alpha road bikes; its easier than ever for Trek to shine above our competition. For 1999 there are more models, with a wider array of features and designs than ever before. But even though our bikes have changed, they still have that magic ride Trek bikes are known for.

Racing heritage

The overall design of the new trek welded aluminum road bikes is racing. The geometry is very similar to the OCLV bikes used by the US Postal team in the '98 Tour de France. The biggest difference is that the chainstays are slightly longer. The other change is a wider range of sizes. There is a big 63cm frame, and the WSD frames take Trek performance all the way to 43cm.

With our bonded design of '97, we did some 'tube sharing' so some bikes shared top tubes, but not on the OCLV bikes. Since the welded aluminum bikes are premium framesets, this is a 'custom' level of geometry, with each bike designed on its own.

Through careful design, we have blended the best characteristics of the OCLV bikes and aluminum construction. These bikes are extremely light. They ride very well. And unlike some of the monster-tube aluminum road bikes on the market, Trek Alpha road bikes are also comfortable for longer rides.

There are two Alpha road frame platforms for 1999, complimented by a wide selection of forks, wheelsets, and components. Models 1200 to 2500 use the same frameset built for 700c wheels, with performance tweaks done by combining the frame with different forks (see the ICON section for details on the forks). The Alpha SL road frame weighs just 2.9 pounds. The Alpha frame on the 1200 weighs 3.1 pounds. An additional new frameset has been added for women called the WSD which uses 650c wheels, front and rear.

The 700c wheel bike uses butted 6061 T6 aluminum with a radical, deeply aero down tube. This beefy tube is very aero, also eye-catching, but there's some serious engineering at work here. By using a larger diameter down tube, we have vastly increased pedaling efficiency through increased bottom bracket stiffness. This beefy tube is joined to an outer butted head tube. This reinforcement at the headset cups prevents distortion that could prematurely wear the headset bearings.

The top tube is smaller diameter than some of our competitors designs. This reduces weight, but more importantly, its specially selected to add some comfort that those huge-tubed bikes are seriously lacking. A super stiff bike may feel great in a test ride around the block, but unless your roads are better than those near our factory in Wisconsin, that stiffness is not very welcome at mile 98 of the local century.

The seat tube also got some attention. One of the shortcomings of triple chainring equipped bikes is that Shimano front road derailleurs are designed for a 28.6mm seat tube. On a 34.9mm tube, the parallelogram of the front derailleur is pushed past its ideal shift location. We could not get Shimano to redesign the derailleurs so we're using what, by comparison, is a very expensive seat tube design. This tube is 34.9mm at the top and tapers to 31.8mm where the front derailleur attaches. We feel that the extra attention to detail was worthwhile since the new Treks shift a triple much better.

The stays are tapered and shaped 6061. Then they're welded to a hollow forged yoke-style monostay that mimics our OCLV road bikes in styling. This compliments the aerodynamics of the down tube, but our goal was to stiffen braking response, and it works. The other end of the stays are joined to forged dropouts with a replaceable derailleur hanger.

There are many other frame details. Increased tire clearance has a host of benefits including fitting bigger tires, but also can help you get home with a wheel that's out of true. Incredibly smooth welds, with no grinding or putty, highlights the skill of Trek welders. Two water bottle mounts on all 700c sizes, special welded 'batwing' cable guides, and the list goes on.

Alpha SL Road Geometry

Frame size	50	52	54	56	58	60	63
Head angle	72.0	72.5	73.0	73.8	73.8	74.0	74.0
Seat angle	75.0	75.0	74.0	73.5	73.0	73.0	72.5
MM							
Standover	740	754	768	788	806	825	854
Seat tube	500	520	540	560	580	600	630
Head tube	97	97	104	121	140	159	186
Eff. top tube	523	528	545	560	570	580	600
Chainstay	417	417	417	417	417	417	417
BB height	266	266	266	268	268	268	270
Fork offset	47	47	47	43	43	43	43
Trail	61	58	55	54	54	53	53
Wheelbase	988	989	993	994	999	1006	1021
INCH							
Standover	29.1	29.7	30.2	31.0	31.7	32.5	33.6
Seat tube	19.7	20.5	21.3	22.0	22.8	23.6	24.8
Head tube	3.8	3.8	4.1	4.8	5.5	6.3	7.3
Eff. top tube	20.6	20.8	21.5	22.0	22.4	22.8	23.6
Chainstay	16.4	16.4	16.4	16.4	16.4	16.4	16.4
BB height	10.5	10.5	10.5	10.6	10.6	10.6	10.6
Fork offset	1.9	1.9	1.9	1.7	1.7	1.7	1.7
Trail	2.4	2.3	2.1	2.1	2.1	2.1	2.1
Wheelbase	38.9	38.9	39.1	39.1	39.3	39.6	40.2

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	35.0mm
Headset size	22.2/30.2/26.4
Fork length	370mm
Front derailleur	31.8 Down pull
Bottom bracket	68mm
Rear hub OLD	130mm
Chain length	108
Cable stops	Open brake cable Welded down tube stops
Bottle mounts	2
Rack mounts	Yes

Alpha SL special parts	Part #
Front derailleur clamp	T973749
Rear derailleur hanger Attachment bolt	990116 990129
Seat clamp	981631

Women's road bike geometry

As bodies get smaller, their variations within a given overall body height get larger. And their tolerance for misfit gets smaller. The most obvious differences occur between men and women of the same height.

Most women have only been able to choose from a single category of bike design; men's. On taller women, this choice was often satisfactory. Perhaps a few easy changes were necessary, such as a shorter stem and adjusting a different, ladies saddle further forward.

But on smaller women, it was much harder to get a good fit. And even if the fit was accomplished, performance on the small bike often suffered.

Some companies tried to address this by using shorter top tubes coupled to shorter seat tubes. This helped some, but the usual compromise on these attempts was to raise the bottom bracket considerably. Why the high bottom bracket? As the top tube is shortened, the toe clearance around the front wheel is compromised. Raising the bottom bracket alleviates this somewhat. This doesn't help with an already restricted standover, nor does raising the rider's center of gravity help the bike's handling, instead making it tippy and precarious in corners. An additional problem is that raising the bottom bracket without adjusting the handlebar position upward puts the bars lower, when they need to be higher for a woman.

Another solution has been to use a smaller front wheel. This allows a shorter front center, but having two tire sizes, two tube size, two rim sizes, etc causes some maintenance headaches for riders.

Our engineers evaluated all this and decided that to get the best overall fit, AND PERFORMANCE, smaller wheels front and rear coupled to an entire new geometry was the best way to solve the small rider fit. An important point here is that although the frame engineers were working on women's solutions, many smaller males may find that these bikes ride better than past compromises they've made to get a good fit.

Smaller wheels

Using smaller wheels has many effects on the bike design. Instead of being forced into particular angles to accommodate an ill-fitting wheelset, 650c wheels allowed our engineers the freedom to pick the exact angles that would yield the best ride. It also allows more 'normal' tubing lengths so the bike has the normal flex and liveliness 'big' people expect from their bikes. Better fit. Better feel. Better function.

For better fit, we started by offering a shorter top tube. Previous attempts used a radically slack head angle and steep seat angle to shorten the top tube. While Trek women's geometry is different than men's in this respect, our shorter top tube is not at the sacrifice of handling. The head angles is slightly more relaxed, but this is to add steering stability, not toe clip clearance. Toe clip clearance is adequate on even the smallest frame size, assuming that the small rider also has small feet. But women riders do not have as much weight in their shoulders as a man of similar height. That weight works with trail to provide steering stability and tracking on a bicycle. Our head angle is tuned just to provide good handling.

Another important fit parameter is standover height. With lesser efforts, the 'short' bike actually ends up with less standover, although some bikes have used bent or chopped top tubes to cover up this problem. Again, its not just standover at issue, its also bottom bracket height. A tall bottom bracket makes a bike handle like its on stilts, but its also harder to get started on. Our women's bikes have lower bottom brackets than do the 'men's' since they are designed to be used with shorter cranks, typically 165 to 170. The resulting lower center of mass adds stability and makes these bikes corner like a dream.

Another special detail we've added is to address the lower centripetal force generated by the smaller diameter wheel. The wheel's rotation provides a stabilizing force much like a gyroscope. The lighter the wheel, or the closer to the hub the mass is located, the lower this force is. Since this force provides stability coupled with trail, we use a shorter fork rake (offset) to add trail. The result is a bike that handles neutrally, even with the lighter, smaller wheel. yet those smaller wheels really accelerate, so a smaller person who might not have the horsepower of a bigger rider can really move. Fun. And fast!

You're probably thinking that this sound good, but most of those Trek engineers look like pretty big guys. How do they know this really works? Simple. We found a touring group who was interested in smaller bikes for their clients, and let them use our prototypes for several crossings of the US and some touring in China. With over 20,000 test miles, the number one comment we heard after rides was "How much is it? I want one!".

Alpha Road WSD Geometry

Frame size	43	47	52
Head angle	73.0	72.5	72.5
Seat angle	76.0	75.0	74.0
MM			
Standover	683	708	751
Seat tube	430	470	520
Head tube	97	97	133
Eff. top tube	490	500	505
Chainstay	412	412	412
BB height	262	264	264
Fork offset	38	38	38
Trail	55	58	58
Wheelbase	950	956	954
INCH			
Standover	26.9	27.9	29.6
Seat tube	16.9	18.5	20.5
Head tube	3.8	3.8	5.2
Eff. top tube	19.3	19.7	19.9
Chainstay	16.2	16.2	16.2
BB height	10.3	10.4	10.4
Fork offset	1.5	1.5	1.5
Trail	2.2	2.3	2.3
Wheelbase	37.4	37.6	37.6

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	35.0mm
Headset size	22.2/30.2/26.4
Fork length	345mm
Front derailleur	31.8 Down pull
Bottom bracket	68mm
Rear hub OLD	130mm
Chain length	108
Cable stops	Open brake cable Welded down tube stops
Bottle mounts	2 (1 on 43)
Rack mounts	Yes

Alpha SL WSD Special Parts	Part #
Front derailleur clamp	T973749
Seat clamp	981631
650c ICON Carbon Classic fork	
650c Rolf Vector Comp wheelset	

The 1200 is a great recreational road bike, with a sporty yet stable ride. Built with 7005 aluminum, it is quite light, although slightly heavier than its Alpha cousins.

1200 Geometry

Frame size	43	50	54	56	58	60
Head angle	72.5	72.5	72.5	73.5	74.0	74.0
Seat angle	75.0	75.0	74.0	73.5	73.5	73.0
MM						
Standover	713	747	765	785	804	821
Seat tube	430	500	540	560	580	600
Head tube	100	100	100	115	135	150
Eff. top tube	520	520	536	555	565	575
Chainstay	415	415	415	415	415	415
BB height	266	266	266	266	266	266
Fork offset	47	47	47	47	43	43
Trail	58	58	58	51	53	53
Wheelbase	980	980	987	989	989	999
INCH						
Standover	28.1	29.4	30.1	30.9	31.7	32.3
Seat tube	16.9	19.7	21.3	22.0	22.8	23.6
Head tube	3.9	3.9	3.9	4.5	5.3	5.9
Eff. top tube	20.5	20.5	21.1	21.9	22.2	22.6
Chainstay	16.3	16.3	16.3	16.3	16.3	16.3
BB height	10.5	10.5	10.5	10.5	10.5	10.5
Fork offset	1.9	1.9	1.9	1.9	1.7	1.7
Trail	2.3	2.3	2.3	2.0	2.1	2.1
Wheelbase	38.6	38.6	38.9	38.9	38.9	39.3

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	35.0mm
Headset size	22.2/30.0/27.0
Fork length	370mm
Front derailleur	31.8
	Down pull
Bottom bracket	68mm
Rear hub OLD	130mm
Cable stops	Open brake cable
	Welded down tube stops
Bottle mounts	2
Rack mounts	Yes

Alpha Road Special Parts	Part #
Front derailleur clamp	T973749

Intensity: Pro
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Professional

2500

Our Price $_____

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Air Rail
Headset	Tange Seiki Vantage DL
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano Dura-Ace STI
Front derailleur	Shimano Dura-Ace
Rear derailleur	Shimano Dura-Ace
Front brake	Shimano Dura-Ace
Rear brake	Shimano Dura-Ace
Brake levers	Integrated brake/shift
Crankset	Shimano Dura-Ace 53/39
Bottom bracket	Shimano Ultegra, 68 x 109.5
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano Dura-Ace 12-23, 9spd
Chain	Shimano Dura-Ace, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 14° Radial, 280
	Rear 16° 1x, 286/284 (D/ND)
Saddle	Giro Fi'zi:k Pave, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector Pro
Front hub	Rolf/ Hugi
Rear hub	Rolf/ Hugi
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Blade, locking alloy nips
Tubes	Presta valve, 48mm stem

- Alpha road frame- light, comfortable aluminum ride
- ICON Air Rail fork- laterally rigid, yet comfortable
- Dura-Ace group- Professional race performance
- Rolf Vector Pro wheels- very fast, durable
- Continental Grand Prix 3000 tires- super fast, hard wearing
- ICON seatpost, bar and stem- light and strong
- ICON De la Sole pedals- just 260 grams!

Additionals 2 water bottle mounts, rack mounts

Colors Metal Flake Blue • Red decal

Bike sizes	50	52	54	56	58	60	63
Handlebar width	400	400	420	420	440	440	460
Stem length	60/-17°	60/-17°	80/-17°	100/-17°	100/-17°	120/-17°	120/-17°
Crank length	170	170	172.5	172.5	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	142	142	150	167	185	204	232
MM Reach	583	588	625	660	670	700	720
Handlebar height	778	779	789	804	825	843	867
IN Reach	23.0	23.1	24.6	26.0	26.4	27.6	28.3
Handlebar height	30.6	30.7	31.1	31.7	32.5	33.2	34.1

2300D

Our Price $_____

Intensity: Racing
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Professional

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Air Rail
Headset	Tange Seiki Vantage DL
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano Ultegra STI Flite Deck compatible
Front derailleur	Shimano Ultegra
Rear derailleur	Shimano Ultegra
Front brake	Shimano Ultegra
Rear brake	Shimano Ultegra
Brake levers	Integrated brake/shift
Crankset	Shimano Ultegra 53/39
Bottom bracket	Shimano Ultegra, 68 x 109.5
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano Ultegra 12-25, 9spd
Chain	Shimano HG92, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 18° Radial, 270 Rear 20° 2x, 290/288 (D/ND)
Saddle	Selle Italia Sphere, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Vector Comp
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Aero stainless, alloy nips
Tubes	Presta valve, 48mm stem

- Alpha road frame- light, comfortable aluminum ride
- ICON Air Rail fork- laterally rigid, yet comfortable
- Ultegra group with STI- 9 speed!
- Rolf Vector Comp wheels- fast, low maintenance
- Continental Grand Prix 3000 tires- super fast, hard wearing
- ICON seatpost, bar and stem- light and strong
- ICON De la Sole pedals- just 260 grams!

Additionals 2 water bottle mounts, rack mounts

Colors Trek Red • White decal

Bike sizes	50	52	54	56	58	60	63
Handlebar width	400	400	420	420	440	440	460
Stem length	60/-17°	60/-17°	80/-17°	100/-17°	100/-17°	120/-17°	120/-17°
Crank length	170	170	172.5	172.5	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	142	142	150	167	186	205	232
MM Reach	583	588	625	660	670	700	720
Handlebar height	778	779	789	804	825	843	867
IN Reach	23.0	23.1	24.6	26.0	26.4	27.6	28.3
Handlebar height	30.6	30.7	31.1	31.7	32.5	33.2	34.1

2300T

Our Price $_____

Intensity: Racing
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Professional

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Air Rail
Headset	Tange Seiki Vantage DL
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano Ultegra STI Flite Deck compatible
Front derailleur	Shimano Ultegra T
Rear derailleur	Shimano Ultegra GS
Front brake	Shimano Ultegra
Rear brake	Shimano Ultegra
Brake levers	Integrated brake/shift
Crankset	Shimano Ultegra 52/42/30
Bottom bracket	Shimano Ultegra, 68 x 118
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano Ultegra 12-25, 9spd
Chain	Shimano HG92, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 18° Radial, 270 Rear 20° 2x, 290/288 (D/ND)
Saddle	Selle Italia Sphere, Ti/leather
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Vector Comp
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Grand Prix 3000 folding, 700 x 25c
Rear tire	Continental Grand Prix 3000 folding, 700 x 25c
Spokes	DT Aero stainless, alloy nips
Tubes	Presta valve, 48mm stem

- Alpha road frame- light, comfortable aluminum ride
- ICON Air Rail fork- laterally rigid, yet comfortable
- Ultegra Triple group with STI- 27 speed!
- Rolf Vector Comp wheels- fast, low maintenance
- Continental Grand Prix 3000 tires- super fast, hard wearing
- ICON seatpost, bar and stem- light and strong
- ICON De la Sole pedals- just 260 grams!

Additionals 2 water bottle mounts, rack mounts

Colors Trek Red • White decal

Bike sizes	50	52	54	56	58	60	63
Handlebar width	400	400	420	420	440	440	460
Stem length	60/0°	80/0°	80/0°	100/0°	100/0°	120/0°	120/0°
Crank length	170	170	172.5	172.5	172.5	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	142	142	150	167	185	204	232
MM Reach	580	604	622	656	666	695	715
Handlebar height	795	802	812	833	852	878	902
IN Reach	22.8	23.8	24.5	25.8	26.2	27.4	28.2
Handlebar height	31.3	31.6	32.0	32.8	33.5	34.6	35.5

2200D

Our Price $_____

Intensity: Racing
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Competitive

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Carbon Classic
Headset	Tange Seiki Passage DX, alloy
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano 105 STI Flite Deck compatible
Front derailleur	Shimano 105
Rear derailleur	Shimano 105
Front brake	Shimano 105
Rear brake	Shimano 105
Brake levers	Integrated brake/shift
Crankset	Shimano 105 53/39
Bottom bracket	Shimano 105, 68 x 109.5
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano HG70 12-25, 9spd
Chain	Shimano HG72, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 20° Radial, 278 Rear 24° 2x, 288/287 (D/ND)
Saddle	Selle Italia Sphere
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Super Sport, 700 x 25c
Rear tire	Continental Super Sport, 700 x 25c
Spokes	DT 14/15G butted stainless
Tubes	Presta valve

- Alpha road frame- light, comfortable aluminum ride
- ICON Carbon Classic fork- light and comfortable
- 105 group with STI- 9 speed!
- Rolf Vector wheels- fast, low maintenance
- Continental tires- fast, hard wearing
- ICON seatpost, bar and stem- light and strong
- ICON De la Sole pedals- just 260 grams!
- DX headset- alloy for low weight
- Wide range 12-25 cassette- lower gears

Additionals 2 water bottle mounts, rack mounts

Colors Black Gold • Silver decal

Bike sizes	50	52	54	56	58	60	63
Handlebar width	400	400	420	420	440	440	460
Stem length	60/-17°	80/-17°	80/-17°	100/-17°	100/-17°	120/-17°	120/-17°
Crank length	170	170	172.5	172.5	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	144	144	151	168	187	206	234
MM Reach	583	608	625	660	670	700	720
Handlebar height	780	781	791	806	827	845	869
IN Reach	23.0	23.9	24.6	26.0	26.4	27.6	28.3
Handlebar height	30.7	30.7	31.1	31.7	32.5	33.3	34.2

2200T WSD

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Carbon Classic 650
Headset	Tange Seiki Passage DX, alloy
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano 105 STI Flite Deck compatible
Front derailleur	Shimano 105 T
Rear derailleur	Shimano 105 GS
Front brake	Shimano 105
Rear brake	Shimano 105
Brake levers	Integrated brake/shift
Crankset	Shimano 105 52/42/30
Bottom bracket	Shimano 105, 68 x 118
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano HG70 12-25, 9spd
Chain	Shimano HG72, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 20° Radial, 252 Rear 24° 2x, 263/262 (D/ND)
Saddle	Terry Sport, leather cover
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt

Wheelset	Rolf Vector 650
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Grand Prix folding, 650 x 23c
Rear tire	Continental Grand Prix folding, 650 x 23c
Spokes	DT 14/15G butted stainless
Tubes	Presta valve

- Alpha road frame- light, comfortable aluminum ride
- ICON Carbon Classic fork- light and comfortable
- 105 Triple group with STI- 27 speed!
- Rolf Vector wheels- fast, low maintenance
- Continental tires- fast, hard wearing
- ICON seatpost, bar and stem- light and strong
- ICON De la Sole pedals- just 260 grams!
- DX headset- alloy for low weight
- Wide range 12-25 cassette- lower gears

Additionals 2 water bottle mounts, rack mounts

Colors Black Gold • Warm Silver decal

Bike sizes	43	47	52
Handlebar width	380	380	380
Stem length	70/0°	90/0°	100/0°
Crank length	165	165	170
Seatpost length	250	250	250
Steerer length	144	144	180
MM Reach	557	586	600
Handlebar height	749	752	795
IN Reach	21.9	23.1	23.6
Handlebar height	29.5	29.6	31.3

2200T

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Carbon Classic
Headset	Tange Seiki Passage DX, alloy
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano 105 STI Flite Deck compatible
Front derailleur	Shimano 105 T
Rear derailleur	Shimano 105 GS
Front brake	Shimano 105
Rear brake	Shimano 105
Brake levers	Integrated brake/shift
Crankset	Shimano 105 52/42/30
Bottom bracket	Shimano 105, 68 x 118
Pedals	ICON De La Sole, 9/16" axle
Cassette	Shimano HG70 12-25, 9spd
Chain	Shimano HG72, 108 L, 9 speed
Rim strips	Velox 16mm
Spoke lengths	Front 20° Radial, 278 Rear 24° 2x, 288/287 (D/ND)
Saddle	Selle Italia Sphere
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Vector
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Super Sport, 700 x 25c
Rear tire	Continental Super Sport, 700 x 25c
Spokes	DT 14/15G butted stainless
Tubes	Presta valve

- Alpha road frame- light, comfortable aluminum ride
- ICON Carbon Classic fork- light and comfortable
- 105 Triple group with STI- 27 speed!
- Rolf Vector wheels- fast, low maintenance
- Continental tires- fast, hard wearing
- ICON seatpost, bar and stem- light and strong
- ICON De la Sole pedals- just 260 grams!
- DX headset- alloy for low weight
- Wide range 12-25 cassette- lower gears

Additionals 2 water bottle mounts, rack mounts

Colors Black Gold • Silver decal

Bike sizes	50	52	54	56	58	60	63
Handlebar width	400	400	420	420	440	440	460
Stem length	70/0°	70/0°	90/0°	100/0°	100/0°	120/0°	120/0°
Crank length	170	170	170	170	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	144	144	151	168	187	206	234
MM Reach	590	595	631	656	666	695	715
Handlebar height	800	801	814	833	856	880	904
IN Reach	23.2	23.4	24.8	25.8	26.2	27.4	28.2
Handlebar height	31.5	31.5	32.1	32.8	33.7	34.6	35.6

2100T

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Carbon Classic
Headset	Tange Seiki Passage
Handlebars	ICON Sleeve Ergo
Stem	KWG alloy, 90°
Grips	ICON Powercork
Shifters	Shimano RSX STI Dual Control
Front derailleur	Shimano RSX
Rear derailleur	Shimano 105 GS
Front brake	Shimano RSX
Rear brake	Shimano RSX
Brake levers	Integrated brake/shift
Crankset	Shimano RSX 52/42/30
Bottom bracket	Shimano BB-LP27, 68 x 118
Pedals	ICON SoleMate, 9/16" axle
Cassette	Shimano HG50 13-26, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Velox 16mm
Spoke lengths	Front 20° Radial, 278 Rear 24° 2x, 288/287 (D/ND)
Saddle	Selle Italia Sphere
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/integral bolt
Wheelset	Rolf Vector
Front hub	Rolf
Rear hub	Rolf
Front tire	Continental Super Sport, 700 x 25c
Rear tire	Continental Super Sport, 700 x 25c
Spokes	DT 14/15G butted stainless
Tubes	Presta valve

- Alpha 6061 aluminum frame- light, comfortable aluminum ride
- ICON Carbon Classic fork- light and comfortable
- Rolf Vector wheels- fast, low maintenance
- 105 rear derailleur- light and quick shifting
- RSX Triple group with STI- 24 speed!
- 13-26 8 speed cassette- extra low gear for easy climbing
- Continental tires- fast, hard wearing
- ICON bar and stem- Ergo, light and strong
- ICON SoleMate pedals- easy entry, double sided for shoe support

Additionals 2 water bottle mounts, rack mounts

Colors Metal Flake Red • Warm Silver decal

Bike sizes	50	52	54	56	58	60	63
Handlebar width	400	400	420	420	440	440	460
Stem length	70/0°	70/0°	90/0°	100/0°	115/0°	115/0°	115/0°
Crank length	170	170	170	170	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	139	139	147	164	183	202	229
MM Reach	590	595	631	656	680	691	711
Handlebar height	796	797	810	828	856	874	898
IN Reach	23.2	23.4	24.8	25.8	26.8	27.2	28.0
Handlebar height	31.3	31.4	31.9	32.6	33.7	34.4	35.4

2000T

Our Price $_____

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	Epoxy bonded aluminum
Headset	Tange Seiki Passage
Handlebars	ICON Sleeve Ergo
Stem	KWG alloy, 90°
Grips	ICON Powercork
Shifters	Shimano RSX STI Dual Control
Front derailleur	Shimano RSX T
Rear derailleur	Shimano RSX GS
Front brake	Shimano RSX
Rear brake	Shimano RSX
Brake levers	Integrated brake/shift
Crankset	Shimano RSX 52/42/30
Bottom bracket	Shimano BB-LP27, 68 x 118
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50 13-26, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Velox 16mm
Spoke lengths	Front 32° 3x, 295 Rear 32° 3x, 292/294 (D/ND)
Saddle	Selle Italia Sphere
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/integral bolt

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Front Rim	Mavic CXP21
Rear Rim	Mavic CXP21
Front hub	Shimano RSX
Rear hub	Shimano RSX
Front tire	Continental Super Sport, 700 x 25c
Rear tire	Continental Super Sport, 700 x 25c
Spokes	DT 14G stainless
Tubes	Presta valve

- Alpha 6061 aluminum frame- light, comfortable aluminum ride
- Bonded aluminum fork- strong and comfortable
- RSX Triple group with STI- 24 speed!
- 13-26 8 speed cassette- extra low gear for easy climbing
- Continental tires- fast, hard wearing
- ICON bar- Ergo shape for comfort
- Alloy cage and body pedals- durable and light

Additionals 2 water bottle mounts, rack mounts

Colors Inkwell Blue • Silver decal

Bike sizes	50	52	54	56	58	60	63
Handlebar width	400	400	420	420	440	440	460
Stem length	70/0°	70/0°	90/0°	100/0°	100/0°	115/0°	115/0°
Crank length	170	170	170	170	175	175	175
Seatpost length	250	250	250	250	250	250	250
Steerer length	139	139	147	164	183	202	229
MM Reach	590	595	631	656	666	691	711
Handlebar height	797	798	811	829	853	875	899
IN Reach	23.2	23.4	24.8	25.8	26.2	27.2	28.0
Handlebar height	31.4	31.4	31.9	32.7	33.6	34.5	35.4

2000T WSD

Our Price $_____

Frameset	Aero 6061 T6 aluminum
Main tubes	Aero 6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	ICON Carbon Classic 650
Headset	Tange Seiki Passage
Handlebars	ICON Sleeve Ergo
Stem	KWG alloy, 90°
Grips	ICON Powercork
Shifters	Shimano RSX STI Dual Control
Front derailleur	Shimano RSX T
Rear derailleur	Shimano RSX GS
Front brake	Shimano RSX
Rear brake	Shimano RSX
Brake levers	Integrated brake/shift
Crankset	Shimano RSX 52/42/30
Bottom bracket	Shimano BB-LP27, 68 x 118
Pedals	Alloy/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50 12-25, 8spd
Chain	IG31, 108 length, 3/32"
Rim strips	Velox 16mm
Spoke lengths	Front 32° 3x, 270 Rear 32° 3x, 267/269 (D/ND)
Saddle	Terry Sport
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/integral bolt

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Race/tour
Spec level: Competitive

Front Rim	Mavic CXP21
Rear Rim	Mavic CXP21
Front hub	Shimano RSX
Rear hub	Shimano RSX
Front tire	Continental Grand Prix, folding, 650 x 23c
Rear tire	Continental Grand Prix, folding, 650 x 23c
Spokes	DT 15G stainless
Tubes	Presta valve

- Alpha WSD frame- performance ride for women
- ICON Carbon Classic fork- light and comfortable
- RSX Triple group with STI- 24 speed!
- 13-26 8 speed cassette- extra low gear for easy climbing
- Continental tires- fast, hard wearing
- ICON bar- Ergo shape for comfort
- Alloy cage and body pedals- durable and light

Additionals 2 water bottle mounts, rack mounts

Colors Inkwell Blue • Silver decal

Bike sizes	43	47	52
Handlebar width	380	380	380
Stem length	70/0°	90/0°	100/0°
Crank length	170	170	170
Seatpost length	250	250	250
Steerer length	139	139	176
MM Reach	557	586	600
Handlebar height	750	753	790
IN Reach	21.9	23.1	23.6
Handlebar height	29.5	29.6	31.1

1200 T

Our Price $_____

Intensity: Training
Surface types: Pavement
Topography: Mountainous
Distance: Extended
Spec level: Recreational

Frameset	7005 T6 TIG aluminum
Main tubes	7005 T6 TIG aluminum
Stays	7005 T6 TIG aluminum
Fork	Cro-Moly, mm
Headset	Tange Seiki Passage
Handlebars	ICON Swoop Ergo
Stem	Alloy
Grips	Cork tape, red
Shifters	Shimano RSX STI Dual Control
Front derailleur	Shimano RSX
Rear derailleur	Shimano RSX GS
Front brake	Shimano RSX
Rear brake	Shimano RSX
Brake levers	Integrated brake/shift
Crankset	Shimano RSX 52/42/30
Bottom bracket	TS BB7700, 68
Pedals	Steel/alloy cage w/clips, 9/16" axle
Cassette	Shimano HG50 13-26, 8spd
Chain	KMC Z-51, 106 length, 3/32"
Rim strips	Cloth
Spoke lengths	Front 32° 3x, 293 Rear 32° 3x, 290/292 (D/ND)
Saddle	Selle Italia XO
Seatpost	Alloy micro-adjust
Seat binder	Kalloy 8 x 25

Front Rim	Vuelta Airline, alloy
Rear Rim	Vuelta Airline, alloy
Front hub	Shimano RSX
Rear hub	Shimano RSX
Front tire	Continental Super Sport 100, 700 x 28c
Rear tire	Continental Super Sport 100, 700 x 28c
Spokes	14G stainless
Tubes	Presta valve

- Alpha aluminum frame- light, comfortable aluminum ride
- RSX Triple group with STI- 24 speed!
- 13-26 8 speed cassette- extra low gear for easy climbing
- Vuelta alloy rims- aero, strong, light
- Continental tires- fast, hard wearing
- ICON bar- Ergo shape for comfort
- Alloy cage and body pedals- durable and light
- Selle Italia saddle- comfortable Italian shape

Additionals 2 water bottle mounts, rack mounts

Colors Metal Flake Green • Gold decal

Bike sizes	43	50	54	56	58	60
Handlebar width	380	400	400	400	420	420
Stem length	80/0°	80/0°	100/0°	100/0°	110/0°	120/0°
Crank length	170	170	170	175	175	175
Seatpost length	250	250	250	250	250	250
Steerer length	120	120	135	150	170	185
MM Reach	596	596	631	651	671	690
Handlebar height	796	796	802	823	845	863
IN Reach	23.5	23.5	24.9	25.6	26.4	27.2
Handlebar height	31.4	31.4	31.6	32.4	33.3	34.0

320 Geometry

Frame size	43	50	54	56	58	60
Head angle	72.5	72.5	72.5	73.5	74.0	74.0
Seat angle	75.0	75.0	74.0	73.5	73.5	73.0
MM						
Standover	713	747	765	785	804	821
Seat tube	430	500	540	560	580	600
Head tube	100	100	100	115	135	150
Eff. top tube	520	520	536	555	565	575
Chainstay	415	415	415	415	415	415
BB height	266	266	266	266	266	266
Fork offset	47	47	47	47	43	43
Trail	60	60	60	54	55	55
Wheelbase	980	980	987	989	989	999
INCH						
Standover	28.1	29.4	30.1	30.9	31.7	32.3
Seat tube	16.9	19.7	21.3	22.0	22.8	23.6
Head tube	3.9	3.9	3.9	4.5	5.3	5.9
Eff. top tube	20.5	20.5	21.1	21.9	22.2	22.6
Chainstay	16.3	16.3	16.3	16.3	16.3	16.3
BB height	10.5	10.5	10.5	10.5	10.5	10.5
Fork offset	1.9	1.9	1.9	1.9	1.7	1.7
Trail	2.4	2.4	2.4	2.1	2.1	2.1

320

Our Price $_____

Intensity: Sporty
Surface types: Pavement
Topography: Rolling
Distance: Extended
Spec level: Recreational

Frameset	Double-butted Cro-Moly steel
Main tubes	Double-butted Cro-Moly steel
Stays	High tensile steel
Fork	Cro-Moly
Headset	VP H692W
Handlebars	Alloy, Ergo bend
Stem	Cro-Moly
Grips	Cork tape, black
Shifters	Shimano RSX STI Dual Control
Front derailleur	Shimano RSX
Rear derailleur	Shimano RSX GS
Front brake	Alloy dual pivot
Rear brake	Alloy dual pivot
Brake levers	Integrated brake/shift
Crankset	Cyclone 52/42/32
Bottom bracket	TS, 68
Pedals	Resin w/clips, 9/16" axle
Cassette	11-28, 8spd
Chain	KMC Z-51, 106 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 293 Rear 32° 3x, 290/2921 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Bolt

Front Rim	Vuelta Airline, alloy
Rear Rim	Vuelta Airline, alloy
Front hub	KT alloy
Rear hub	KT alloy
Front tire	700 x 28c
Rear tire	700 x 28c
Spokes	14G stainless
Tubes	Presta valve

- Double butted Cro-Moly frame- light, lively ride
- Triple crank with RSX STI- 24 speed!
- 52/42/32 chainrings- standard road gearing
- 11-28 8 speed cassette- extra low gear for easy climbing
- Vuelta alloy rims- aero, strong, light
- Alloy bar- Ergo shape for comfort

* Trek Super Soft saddle- comfortable

Additionals 2 water bottle mounts, rack mounts

Colors Deep Teal • Silver decal

Bike sizes	43	50	54	56	58	60
Handlebar width	380	400	400	400	420	420
Stem length	80/0°	80/0°	100/0°	100/0°	100/0°	120/0°
Crank length	170	170	170	175	175	175
Seatpost length	250	250	250	250	250	250
Steerer length	120	120	135	150	170	185
MM **Reach**	596	596	631	651	661	690
Handlebar height	799	799	805	825	845	865
IN **Reach**	23.5	23.5	24.9	25.6	26.0	27.2
Handlebar height	31.5	31.5	31.7	32.5	33.3	34.1

A touring bike is designed for carrying loaded panniers. A full load means everything a cyclist needs to live on the road, from food to tents, tools to toothbrush. All that weight has a strong effect, making a regular bike sluggish to steer, wobbly on descents, hard to stop, and hell to pedal uphill.

A good touring bike is especially adapted to offer better performance when loaded. It should have components for the job. Big tires resist the pinch flats when adding 40-80 pounds to the weight of the rider.

A loaded bike is not as maneuverable so its hard to avoid potholes. So extra strong rims with additional spokes are in order. Wide ratio gearing is a must, with an emphasis on low gears for the hills. To stop the extra weight, beefy brakes are an absolute requirement.

But what is different about the frame of a touring bike? Its easy to see the additional braze-ons (for lack of a better term) of a touring bike, attachments for front and rear racks, fenders, and several bottles. But while these amenities allow easy attachment of accessories, they don't make the bike ride differently.

A touring bike needs to accomplish several things; the rider needs to be in a good position without interference from their gear, and the frame needs to respond well to the rider's input when fully loaded without any bad manners.

Let's start with bottom bracket height. We don't anticipate hard accelerations through corners, so hitting pedals shouldn't be an issue. A low bottom bracket will aid the tourist in balancing the bike before they make their first pedal stroke. It will be easier to get on, and the lower center of gravity will make the bike more stable when rolling as well.

A slack seat angle puts the rider slightly behind a neutral position over the pedals. This gives the rider a bit more power on the hills. When combined with a more upright stance, the angles of their hips, knees and torso are correct in this more rearward seating position.

A slack head angle slows steering input while lots of trail adds steering stability. A good touring bike may be less than exciting on a day ride, but the extra stability is very useful when dropping off a mountain pass at high speed. The extra weight really makes a touring bike fly, and the last thing a tourist wants is twitchy handling at speed.

When pedaling long miles, its really annoying to have your feet hit the panniers. Extra long chainstays help prevent this. Long chainstays also make for a long wheelbase, and combined they give a feeling of the bike wanting to go straight. This means the bike rolls down the road with little input, which will be much appreciated as the miles go by. Its not that the tourist is an inattentive driver, but that they have better things to do than wrestling their bike down every mile of road. A smooth, stable ride lets them enjoy to their surroundings instead of the road surface.

With the longer stays, longer front end, longer wheelbase, and extra weight on the bike, frame rigidity becomes very important. To keep a touring bike from wobbling, or being hard to control in maneuvers, the frame must be stiff. In a test ride, its hard to imagine how a bike will feel fully loaded. In such a test a truly great touring bike may seem too stiff to be comfortable. But a comfortable day-ride bike can be hard to ride with a load.

Its easy to see that for true long distance touring performance, a special bike is needed. The problem arises when a cyclist cannot afford, or doesn't want, a special use bike. How do they enjoy touring, yet feel satisfied in riding the same bike every day? The key to making a tourer feel fun on day rides is a lightweight frame. If the frame can meet the demands of touring, but can also be made light, it will still be fun to ride on shorter rides. On the 540, we've managed to do this with a fairly sophisticated aluminum tubeset using custom butting. On the 520, we made a more economical version from butted Cro-Moly steel. You'll notice that the geometries of these two bikes are different to allow each material to be used to its best advantage. Even so, the 540 has a custom level of design and its aluminum frame is lighter. Thus the 540 is our highest level of touring performance, a bike that we think outperforms everything else on the open road.

The 540 has special eyelets for the rear rack attachment. Most bikes use rear rack attachments which require the rack ears to be parallel the bike's centerline. This requires that the ears be bent twice for a proper fit. On the 540, the rack mounts only require a single bent to the rack ear. While they may not look as pretty on the sales floor, the rack mount is more rigid on the road.

Aluminum Touring Geometry

Frame size	52	56	58	60	64
Head angle	70.9	71.9	72.3	72.3	72.9
Seat angle	71.9	72.4	72.3	72.3	72.4
MM					
Standover	709	797	818	839	883
Seat tube	457	550	590	610	650
Head tube	82	113	136	157	201
Eff. top tube	542	554	578	590	616
Chainstay	457	457	457	457	457
BB height	258	261	262	265	270
Fork offset	52	52	52	52	52
Trail	65	58	56	56	52
Wheelbase	1027	1048	1057	1070	1093
INCH					
Standover	28.3	31.2	32.0	32.9	34.6
Seat tube	18.0	21.7	23.2	24.0	25.6
Head tube	3.3	4.6	5.5	6.4	8.0
Eff. top tube	21.3	21.8	22.8	23.2	24.3
Chainstay	18.0	18.0	18.0	18.0	18.0
BB height	10.2	10.3	10.3	10.4	10.6
Fork offset	2.0	2.0	2.0	2.0	2.0
Trail	2.5	2.3	2.2	2.2	2.1
Wheelbase	40.4	41.3	41.6	42.1	43.0

Mechanic's Specs and Notes

Seatpost diameter	31.6mm
Seatclamp diameter	36.4mm
Headset size	22.2/30.2/26.4
Fork length	392mm
Front derailleur	34.9
	Down pull
Bottom bracket	68mm
Rear hub OLD	130mm
Chain length	116
Cable stops	Open brake cable
	Welded down tube stops
Bottle mounts	3
Rack mounts	Rear and Lowrider fork

Steel Touring Geometry

Frame size	17	19	21	23	25
Head angle	71.0	71.0	71.0	72.0	72.5
Seat angle	74.0	74.0	73.5	73.0	72.0
MM					
Standover	697	727	764	806	852
Seat tube	432	483	533	584	635
Head tube	90	90	90	120	165
Eff. top tube	540	545	555	566	590
Chainstay	450	450	450	450	450
BB height	268	268	268	268	268
Fork offset	52	52	52	52	52
Trail	64	64	64	58	55
Wheelbase	1044	1046	1054	1052	1062
INCH					
Standover	27.4	28.6	30.1	31.7	33.5
Seat tube	17.0	19.0	21.0	23.0	25.0
Head tube	3.5	3.5	3.5	4.7	6.5
Eff. top tube	21.3	21.5	21.9	22.3	23.2
Chainstay	17.7	17.7	17.7	17.7	17.7
BB height	10.6	10.6	10.6	10.6	10.6
Fork offset	2.0	2.0	2.0	2.0	2.0
Trail	2.5	2.5	2.5	2.3	2.1
Wheelbase	41.1	41.2	41.5	41.4	41.8

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	31.9mm
Headset size	22.2/30.2/26.4
Fork length	390mm
Front derailleur	31.8
	Down pull
Bottom bracket	68mm
Rear hub OLD	130mm
Chain length	116
Cable stops	Open brake cable
	Down tube shift bosses
Bottle mounts	3
Rack mounts	Rear and Lowrider fork

Aluminum Touring Special Parts	Part #
Front derailleur clamp	T973749
Seat clamp	983153

Intensity: Sporty
Surface types: Pavement
Topography: Mountainous
Distance: Long distance
Spec level: Competitive

540

Our Price

Frameset	6061 T6 aluminum
Main tubes	6061 T6 aluminum
Stays	6061 T6 aluminum
Fork	Cro-Moly
Headset	Tange Seiki CDS
Handlebars	ICON Stash Ergo, 7075 aluminum
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano Ultegra bar ends
Front derailleur	Shimano 105 T
Rear derailleur	Shimano Deore XT SGS
Front brake	Shimano Deore LX V
Rear brake	Shimano Deore LX V
Brake levers	Dia-Compe 287 Aero
Crankset	Shimano 105 52/42/30
Bottom bracket	Shimano 105, 68 x 118
Pedals	Shimano SPD M323 platform/clipless, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	Shimano HG72, 116 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 36° 3x, 295 Rear 36° 3x, 292/293 (D/ND)
Saddle	Selle Bassano E-Z Rider
Seatpost	ICON Oz, 2014 Al
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Fairlane
Rear Rim	Bontrager Fairlane ASYM
Front hub	Shimano Deore LX
Rear hub	Shimano Deore LX
Front tire	Continental Top Touring, 700 x 32c
Rear tire	Continental Top Touring, 700 x 32c
Spokes	DT 14G stainless
Tubes	Presta valve

- Alpha aluminum frame- light, comfortable aluminum ride
- Trek touring design- true touring geometry, full braze-ons
- 24 speed gearing- wide range for any road
- LX V brakes- sure stops
- Bontrager Fairlane 36° rims- extra strong wheels
- ASYM rear rim- less dish, stronger wheel
- Shimano SPD-323 half and half clipless pedals- clip in, or ride the platform
- LX rear hub- freehub design for strong axle
- BB-UN52 - long lasting bearings
- Bar end controls- dependable, friction shift capable
- Conti Top Touring tires- beefy, comfortable

Additionals 3 water bottle mounts, front & rear rack mounts

Colors Pearl White • Gold decal

Bike sizes	52	56	58	60	64
Handlebar width	400	420	420	440	460
Stem length	60/0°	80/0°	80/0°	100/0°	120/0°
Crank length	170	170	175	175	175
Seatpost length	270	270	270	270	270
Steerer length	128	162	185	207	248
MM **Reach**	599	630	654	685	731
Handlebar height	815	850	876	899	943
IN **Reach**	23.6	24.8	25.8	27.0	28.8
Handlebar height	32.1	33.4	34.5	35.4	37.1

520

Our Price $_____

Intensity: Sporty
Surface types: Pavement
Topography: Mountainous
Distance: Long distance
Spec level: Competitive

Frameset	True Temper double butted Cro-Moly
Main tubes	True Temper double butted Cro-Moly
Stays	Cro-Moly steel
Fork	Cro-Moly Touring
Headset	Tange Seiki CDS
Handlebars	ICON Swoop Ergo
Stem	ICON Bordeaux
Grips	ICON Powercork
Shifters	Shimano Ultegra bar ends
Front derailleur	Shimano 105 T
Rear derailleur	Shimano Deore LX SGS
Front brake	Shimano Deore LX V
Rear brake	Shimano Deore LX V
Brake levers	Dia-Compe 287 Aero
Crankset	Shimano 105 52/42/30
Bottom bracket	Shimano 105, 68 x 118
Pedals	Shimano SPD M323 platform/clipless, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	Shimano HG72, 114 length, 3/32"
Rim strips	Velox 22mm
Spoke lengths	Front 36° 3x, 295 Rear 36° 3x, 292/293 (D/ND)
Saddle	Selle Bassano E-Z Rider
Seatpost	Alloy micro-adjust
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Fairlane
Rear Rim	Bontrager Fairlane ASYM
Front hub	Shimano Deore LX
Rear hub	Shimano Deore LX
Front tire	Continental Top Touring, 700 x 32c
Rear tire	Continental Top Touring, 700 x 32c
Spokes	DT 14G stainless
Tubes	Presta valve

- True Temper double butted Cro-Moly tubing- strong, light, and good ride
- Trek touring design- true touring geometry, full braze-ons
- 24 speed gearing- wide range for any road
- LX V brakes- sure stops
- Bontrager Fairlane 36° rims- extra strong wheels
- ASYM rear rim- less dish, stronger wheel
- Shimano SPD-323 half and half clipless pedals- clip in, or ride the platform
- LX rear hub- freehub design for strong axle
- BB-UN52 - long lasting bearings
- Bar end controls- dependable, friction shift capable
- Conti Top Touring tires- beefy, comfortable

Additionals 3 water bottle mounts, front & rear rack mounts, rear rack

Colors Pearl Navy • Gold decal

Bike sizes	17	19	21	23	25
Handlebar width	400	420	420	440	460
Stem length	60/0°	80/0°	100/0°	100/0°	120/0°
Crank length	170	170	170	175	175
Seatpost length	250	250	250	250	250
Steerer length	136	136	136	166	211
MM Reach	597	621	650	661	704
Handlebar height	811	817	824	859	908
IN Reach	23.5	24.4	25.6	26.0	27.7
Handlebar height	31.9	32.2	32.4	33.8	35.8

Who should ride a recumbent?

Cycling has always been populated by unique individuals, and equally full of stereotypes. A popular myth is that recumbent riders are weirdos who aren't quite up to riding a real bike. The people who think this also believe you're required to have tattoos to ride a mountain bike, and that road riders are all snobs.

The point of any of these bikes is that bicycling is fun. You can love your mountain bike, and still enjoy a road bike. Whether you already have a road bike or mountain bike, there's another style of bicycle that's a lot of fun; a recumbent.

The appeal of the recumbent is enjoying all the normal pleasures of cycling while feeling like you're laying back in a barcalounger. Comfort and relaxation are unparalleled compared to other styles of bicycles.

Certainly there are other advantages. The aero position provides a measure of cycling efficiency which results in lower effort, or higher speed. And to date, no other bike will get you noticed as much.

Recumbent types

Recumbents are generally classified into two types; long wheelbase and short wheelbase. Like a conventional bicycle, a longer wheelbase tends to add stability. But the lower center of gravity of a recumbent already greatly increases stability over a standard bike. So instead, Trek designed the R200 with a more sporty, quick handling short wheelbase.

With the front wheel underneath the rider (instead of in front of them) the seating position needs to be a bit higher. Combined with a more upright seating position, this puts the rider's head in most cases slightly higher than the average car hood. The rider sees better, and the cars can see the rider.

This R200s seating position also makes it easier to get started. On a regular bike, you get under way by leaning forward slightly and giving a good push with your grounded foot. To get an idea of how a low position recumbent can make it hard to get under way, imagine trying to accelerate a skateboard while lying on your back. With a slightly higher and more upright position, you can provide plenty of thrust, and learning to ride an R200 doesn't require hours of practice.

Another style division is hand placement. Recumbents which are focused on speed lay the rider way back, and then put their hands beneath the seat. When you rotate the cyclist's feet up with a high bottom bracket, this aero becomes even more pronounced.

But for a casual cyclist, having the hands up in front and the feet a bit lower is less foreign, adding a feeling of security. The proponents of "low hands" say that the upright, high hand position can put your hands to sleep. The R200 avoids this syndrome by using a fully adjustable, telescoping handlebar system that can even be moved while riding. Its a secure position that steers more like other wheeled vehicles. The adjustable feature maintains a high degree of comfort. And when its time to get off, the handlebars allow the rider to easily hold and guide the bike.

A newer division in recumbents is suspension vs. rigid design. Like standard bikes, a rigid frame can be lighter and less expensive. But unlike on a standard bike, a recumbent rider cannot transfer weight to their hands and feet to absorb road shock. Each bump goes straight up the spine. Again, Trek opted for the comfortable approach. The R200 offers a rear suspension design, and the carefully selected pivot location allows the front wheel to benefit from the shock as well.

To summarize, the Trek R200 is a high hands, short wheelbase, suspension recumbent designed to be easy to learn to ride and fun on the long haul.

Where's the front derailleur?

One of the mechanical problems often found on recumbents is that the super long chain run allows the chain to flop around a bit. The result is often greasy chain marks on the legs, or worse yet poor shifting or a dropped chain. The Trek R200 avoids these problems by using a 'jackshaft' design with two freewheels. There is no front derailleur sticking off the front of the bike or cable running between your legs, and there is only one chainring. Overall shifting performance is enhanced and there is a wide gear range with tons of choices, so riders may fine-tune their gears to adapt easily to hills or plains.

Easy transporting

Some recumbents are a real problem to transport to your favorite riding area. Not the R200. Its standard length wheelbase fits standard roof racks. Or even better, the R200 can be easily folded using quick releases. By pulling the QRs, the R200 can be stowed in a standard-sized car trunk in a matter of minutes without tools.

Easy adjustment

With some recumbents, adjusting the distance from the seat to the pedals requires extensive mechanics, including changing the chain length. With the ease of standard quick releases, the R200's sliding seat rail can be adjusted up to ten inches to fit anyone from 5'1" - 6'6". And equally easy, the seat back is adjustable for angle. Combined with the quick release stem length and pivoting steering column, the R200 can go from compact and extra small to extra large and spacious in a matter of minutes.

Recumbent Special Parts

Trek recumbent saddle
QR adjustable stem
Cane Creek rear shock

R 200

Our Price

Intensity: Training
Surface types: Pavement
Topography: Hilly
Distance: Race/tour
Spec level: Competitive

Frameset	Alpha aluminum
Main tubes	Alpha aluminum
Stays	6061 T6 aluminum swingarm
Fork	Cro-Moly
Rear shock	Cane Creek AD5
Headset	Dia-Compe SA Aheadset
Handlebars	Alloy, Arc
Stem	Recumbent adjustable w/quick release
Grips	Trek Oasis, dual density
Shifters	SRAM Centera (custom)
Front derailleur	SRAM ESP 7.0 (rear derailleur)
Rear derailleur	SRAM ESP 7.0
Front brake	Avid Single Digit 10, direct pull
Rear brake	Avid Single Digit 10, direct pull
Brake levers	Avid AD-1.0 L, long pull
Crankset	Cyclone
Bottom bracket	Shimano BB-LP27,
Pedals	ICON SoleMate, 9/16" axle
Cassette	Shimano HG50-I 11-30, 8spd
Chain	KAZ LR-900, length, 3/32"
Rim strips	
Spoke lengths	Front 24° 2x, Rear 28° 2x, (D/ND)
Saddle	Rans Recumbent
Seatpost	
Seat binder	

Front Rim	Weinmann ZAC 19
Rear Rim	Weinmann ZAC 19
Front hub	Bontrager Comp I
Rear hub	Bontrager Comp II
Front tire	Primo Comet, 20 x 1.35
Rear tire	Primo Comet, 20 x 1.35
Spokes	DT 15G stainless
Tubes	Presta

- Alpha frame- lightweight, strong
- 40 speed drivetrain
- 5 way adjustable seating/steering
- Short wheelbase- fun riding, easy to transport
- Rear suspension- comfortable, improves handling, foldable
- Jackshaft drivetrain- no front derailleur, lots of gears
- ICON Solemate pedals- easy entry, good shoe support
- Rans seat- comfortable, supportive
- Quick release seat- easy adjustment without changing chain length
- Avid direct pull brakes- great stopping power
- High hands with adjustable stem- comfortable and secure, reduces fatigue
- Replaceable derailleur hangers

Additionals

Colors Trek Red / Silver fork • Silver decal

Bike sizes		
Handlebar width	580	
Stem length	Adjustable	
Crank length	170	
Steerer length		
Rear shock spring	Air	
MM **Reach**	Adjustable	
Handlebar height	Adjustable	
IN **Reach**	Adjustable	
Handlebar height	Adjustable	

OCLV and Alpha technology make it easy to sell high end Trek bikes on quality American manufacturing and high-tech engineering prowess. But when you're selling a Hi-Tensile steel bike built in Taiwan, how can you show the customer there really is a difference between Trek and Brand X at the box store by the mall?

Trek kids bikes are not off-the-shelf commodity bikes. Its true that we can't produce price competitive carbon fiber kids bikes. However, we can apply our diverse engineering abilities to achieve the same goals with kids bikes as with a Trek 9.9 or Y Foil. We focus on providing the best value per dollar possible, with a cyclist's eye on durability and function.

It may seem funny, but the same product managers who worked to develop the new Trek VRX have sat and discussed how to make a Mt. Cub 12 easier to learn on, on how to position the ride better, and what the best gearing should be. And while we can't check out the fit for ourselves, the parents in the Product group use the same practiced eye to evaluate their kids as they do when watching the riders at local and national events.

Here are a few examples of things we've done to help kids (and parents) get the most from these bikes. Its common for parents to try to size a bike too big to get longer use from it. But this makes the bike harder to ride and less fun, the last thing anyone wants. We've minimized standovers while maximizing seat tube and head tubes, so that a given rider will be able to fit a Trek kids bike for a longer period of time. And ride better the whole time.

We look carefully at fit, including size specific items like cranks, handlebars, grips, even saddle size, to make the bike ride its best.

And our engineering department works diligently to make sure these bikes pass our stringent standards. They make sure frames are strong and components will go the distance.

But lets face it. The kids have to like the way the bike looks. Not only are Treks appealing without being gaudy, they also get high quality finishes.

Quality means the parts are protected from premature failure through corrosion. And the paint stays on the bike better, an important point with a kid who drops their bike in the driveway when they're done riding. So eventually the bike can be passed on to another child and still look good enough to be a treasured part of their childhood. That's value.

Mt. Track 240

Our Price $_____

Intensity: Sporty
Surface types: Off road
Topography: Hilly
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel w/Cro-Moly seat tube
Main tubes	Hi Tensile steel w/Cro-Moly seat tube
Stays	Hi Tensile steel
Fork	Sync, 50mm travel
Headset	VP H992W
Handlebars	Steel, 30mm rise
Stem	Steel ATB
Bar ends	Steel
Grips	Trek Paw Print
Shifters	GripShift MRX-170
Front derailleur	Shimano Altus
Rear derailleur	Shimano Tourney TY30
Front brake	Tektro 915A, direct pull
Rear brake	Tektro 915A, direct pull
Brake levers	Lee Chi LV77E direct pull
Crankset	SR XR-17 42/34/24
Bottom bracket	VP-B33W,
Pedals	Platform, 9/16" axle
Cassette	HG72 13-28, 7spd
Chain	KMC Z-51, length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 242
	Rear 32° 3x, 239/241 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Bolt, M6 x 50

Front Rim	Aluminum alloy
Rear Rim	Aluminum alloy
Front hub	Alloy
Rear hub	Alloy
Front tire	Bontrager Revolt ST-2, 24 x 2.1
Rear tire	Bontrager Revolt ST-2, 24 x 1.75
Spokes	14G stainless
Tubes	Schraeder valve

- Trek engineered- durable, nice ride, low standover fits kids longer as they grow
- Sync suspension fork- adds comfort and control off road
- 21 speeds- wide gearing
- GripShift shifting- doesn't require finger strength to shift
- Alloy rims- low weight, better stopping
- Rear derailleur guard- helps protect bikes when laid down
- Bolt on wheels- more secure against 'junior mechanics'

Additionals	Rear derailleur guard, kickstand
Colors	Team Blue - White fade/ White fork • White and Blue decal

Bike sizes	13B
Handlebar width	560
Handlebar rise	30
Stem length	65/40°
Crank length	162
Seatpost length	300
Steerer length	117
MM Reach	560
Handlebar height	785
IN Reach	22.0
Handlebar height	30.9

Mt. Track 220

Our Price $_____

Intensity: Casual
Surface types: Off road
Topography: Hilly
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel w/Cro-Moly seat tube
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel
Headset	VP H992W
Handlebars	Steel, 30mm rise
Stem	Steel ATB
Grips	Trek Paw Print
Shifters	GripShift MRX-170
Front derailleur	Shimano Altus
Rear derailleur	Shimano Tourney TY30
Front brake	Tektro 915A, direct pull
Rear brake	Tektro 915A, direct pull
Brake levers	Tektro 317A
Crankset	SR XR-17 42/34/24
Bottom bracket	VP-B33W,
Pedals	Platform, 9/16" axle
Cassette	HG72 13-28, 7spd
Chain	KMC Z-51, length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 242
	Rear 32° 3x, 239/241 (D/ND)
Saddle	Trek Super Soft
Seatpost	Alloy micro-adjust
Seat binder	Bolt, M6 x 50

Front Rim	Aluminum alloy
Rear Rim	Aluminum alloy
Front hub	Alloy
Rear hub	Alloy
Front tire	Bontrager Revolt ST-2, 24 x 2.1
Rear tire	Bontrager Revolt ST-2, 24 x 1.75
Spokes	14G stainless
Tubes	Schraeder valve

- Trek engineered- durable, nice ride, low standover fits kids longer as they grow
- 21 speeds- wide gearing
- GripShift shifting- doesn't require finger strength to shift
- Alloy rims- low weight, better stopping
- Rear derailleur guard- helps protect bikes when laid down
- Bolt on wheels- more secure against 'junior mechanics'

Additionals	Rear derailleur guard, kickstand
Colors	Metal Flake Yellow • Red decal (B)
	Team Blue to White fade • White and Blue decal (B)
	Ice Royal Blue • Silver decal (B)
	Ice Red/Ice Cherry fade • Yellow decal (G)
	Ice Grape Purple • Pink decal (G)

Bike sizes	13B	13G
Handlebar width	520	520
Handlebar rise	30	30
Stem length	65/40°	65/40°
Crank length	162	162
Seatpost length	300	300
Steerer length	162	162
MM Reach	561	561
Handlebar height	783	783
IN Reach	22.1	22.1
Handlebar height	30.8	30.8

Mt. Lion 60

Our Price $_____

Intensity: Casual
Surface types: Dirt pathways
Topography: Flat
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel
Headset	VP H992W
Handlebars	Steel, 5° bend, 30mm rise
Stem	Steel ATB
Grips	Trek Paw Print
Shifters	GripShift MRX-170, right only
Front derailleur	
Rear derailleur	Shimano Tourney TY22
Front brake	Tektro 914A, direct pull
Rear brake	Tektro 914A, direct pull
Brake levers	Tektro 317A
Crankset	Three-piece type w/chainguard, 38T
Bottom bracket	VP-B33W,
Pedals	Platform, 1/2" axle
Cassette	HG60 14-28, 6spd
Chain	KMC Z-51, 100 length, 3/32"
Rim strips	Rubber
Spoke lengths	Front 32° 3x, 188
	Rear 32° 3x, 185/187 (D/ND)
Saddle	Trek Paw design
Seatpost	Alloy micro-adjust
Seat binder	Quick release, 47mm

Front Rim	Aluminum alloy
Rear Rim	Aluminum alloy
Front hub	Alloy
Rear hub	Alloy
Front tire	Bontrager Revolt ST-2, 20 x 2.1
Rear tire	Bontrager Revolt ST-2, 20 x 1.75
Spokes	14G UCP
Tubes	Schraeder valve

- Trek engineered- durable, nice ride, low standover fits kids longer as they grow
- 6 speeds- lets kids ride on wide variety of terrain
- GripShift shifting- doesn't require finger strength to shift
- Alloy rims- low weight, makes brakes work better
- Rear derailleur guard- helps protect bikes when laid down
- Bolt on wheels- more secure against 'junior mechanics'

Additionals	Rear derailleur guard, double chainring guards, kickstand	
Colors	Gloss Black • Red decal (B)	
	Teal Pearl • Yellow decal (G)	

Bike sizes	12B	12G
Handlebar width	520	520
Handlebar rise	30	30
Stem length	65/40°	65/40°
Crank length	140	140
Seatpost length	300	250
Steerer length	132	132
MM Reach	468	468
Handlebar height	672	672
IN Reach	18.4	18.4
Handlebar height	26.4	26.4

Intensity: Casual
Surface types: Dirt pathways
Topography: Flat
Distance: Local
Spec level: Recreational

Mt. Lion 30

Our Price $_____

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel
Headset	Steel
Handlebars	BMX
Stem	4 bolt BMX, alloy top
Grips	Trek Paw Print
Front brake	
Rear brake	Coaster w/ rear cantilever
Brake levers	Alloy/alloy
Crankset	One-piece type, 36T
Bottom bracket	One-piece type,
Pedals	Platform, 1/2" axle
Cassette	19
Chain	KMC 410, 86 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 186
	Rear 36° 3x, 184 (D/ND)
Saddle	Trek Paw design
Seatpost	Steel
Seat binder	Bolt

Front Rim	Aluminum alloy
Rear Rim	Aluminum alloy
Front hub	Steel
Rear hub	Coaster brake
Front tire	Trek Paw design, 20 x 2.0
Rear tire	Trek Paw design, 20 x 2.0
Spokes	14G UCP
Tubes	Schraeder valve

- Trek engineered- durable, nice riding bike, easy to learn on, low standover fits kids longer as they grow
- Coaster brake (with hand brake)- easy to stop, doesn't require strong hands
- Alloy rims- light, better stopping
- Great colors- attractive to kids and parents
- Bolt on wheels- more secure against 'junior mechanics'

Additionals	Chainguard, kickstand, and pads, Compact fork	
Colors	Ice Royal Blue • Red decal (B)	
	Ice Red • Yellow decal (B)	
	Ice Pink • Yellow decal (G)	
	Vivid Purple • Yellow decal (G)	

Bike sizes	9.5B	9.5G
Handlebar width	550	550
Handlebar rise	150	150
Stem length	35/0°	35/0°
Crank length	115	115
Seatpost length	250	250
Steerer length	130	130
MM Reach	502	502
Handlebar height	687	687
IN Reach	19.8	19.8
Handlebar height	27.0	27.0

Mt. Cub 16

Our Price $_____

Intensity: Casual
Surface types: Pavement
Topography: Flat
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel
Headset	Steel
Handlebars	Steel BMX, 130mm rise
Stem	4 bolt BMX, alloy top
Grips	Trek Paw design
Front brake	
Rear brake	Coaster w/ rear cantilever
Brake levers	Alloy, right only
Crankset	One-piece type, 32T
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, 1/2" axle
Cassette	19
Chain	KMC 410, 74 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 28° 2x, 138 Rear 28° 2x, 133 (D/ND)
Saddle	Trek Paw design
Seatpost	Steel
Seat binder	Bolt

Front Rim	Steel
Rear Rim	Steel
Front hub	Steel
Rear hub	Coaster brake
Front tire	Trek Paw design, 16 x 1.75
Rear tire	Trek Paw design, 16 x 1.75
Spokes	14G UCP
Tubes	Schraeder valve

- Trek engineered- durable, nice riding bike, easy to learn on
- 16" wheels- allows super low standover, increased usage life for growing kids
- Coaster brake- easy to stop, doesn't require strong hands
- Rear canti brake- helps kids learn about hand brakes without having to depend on them yet
- Great colors- attractive to kids and parents
- Heavy duty training wheels- sturdy for kid abuse
- Bolt on wheels- more secure against 'junior mechanics'

Additionals	Training wheels, chainguard, and pads
Colors	Ice Royal Blue • Yellow decal (B) Ice Red • Royal Blue decal (B) Ice Pink • Yellow decal (G) Vivid Purple • Pink decal (G)

Bike sizes	9B	9G
Handlebar width	510	510
Handlebar rise	130	130
Stem length	40/0°	40/0°
Crank length	115	115
Seatpost length	230	230
Steerer length	128	128
MM Reach	443	443
Handlebar height	591	591
IN Reach	17.4	17.4
Handlebar height	23.3	23.3

Mt. Cub 12

Our Price $_____

Intensity: Casual
Surface types: Pavement
Topography: Flat
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel
Stays	Hi Tensile steel
Fork	Hi Tensile steel
Headset	Steel
Handlebars	BMX
Stem	4 bolt BMX
Grips	Trek Paw design
Front brake	
Rear brake	Coaster
Brake levers	
Crankset	One-piece type, 28T
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, 1/2" axle
Cassette	19
Chain	KMC 410, 60 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 20° Radial, 87 Rear 20° Radial, 80 (D/ND)
Saddle	Trek Paw design
Seatpost	Steel
Seat binder	Bolt

Front Rim	Steel
Rear Rim	Steel
Front hub	Steel
Rear hub	Coaster brake
Front tire	Trek Paw design, 12.5 x 2.125
Rear tire	Trek Paw design, 12.5 x 2.125
Spokes	14G UCP
Tubes	Schraeder valve

- Trek engineered- durable, nice riding bike, easy to learn on
- 12" wheels- allows super low standover, increased usage life for growing kids
- Coaster brake- easy to stop, doesn't require strong hands
- Great colors- attractive to kids and parents
- Heavy duty training wheels- sturdy for kid abuse
- Bolt on wheels- more secure against 'junior mechanics'

Additionals	Training wheels, chainguard, fenders, and pads
Colors	Black • Lime Green decal (B) Misty Pink • White decal (G)

Bike sizes	8	8G
Handlebar width	450	450
Handlebar rise	130	130
Stem length	25/0°	25/0°
Crank length	90	90
Seatpost length	200	200
Steerer length	133	133
MM Reach	366	366
Handlebar height	502	502
IN Reach	14.4	14.4
Handlebar height	19.8	19.8

BMX is changing

The face of BMX is changing. The new Trek steel dirt bikes are changing with it. Built with the new steel "Y-frames", the dirt bikes have the strength and details needed to perform in all styles of BMX riding. The frames are made with a faster geometry to handle quicker and are longer to fit more riders. They come with freestyle dropouts for pegs and freewheel protection. The strength of the frames is matched by the new Bontrager parts package to give the complete bikes the look and strength needed in BMX today.

Trek BMX Steel "Y-frames"

After proving the Y-frame design for two years in aluminum, we bring all the strengths of the Aero tubing and Y-geometry to the Trek steel frames. Three totally new bikes to fit every level of BMX and thrash riding.

Y tubed frame design

We brought the strength of the Trek Y-frame design to all of our steel dirt frames his year. Not only does it give the bikes more strength, it gives them a unique look that kids will ask for.

Longer frame sizes

The top tubes have been made even longer to fit more riders for a longer period of time. A real plus when the parents are trying to buy a bike that will last.

Faster geometry

With shorter chainstays and steeper headtube angles, the steel bikes are better handling for dirt jumping and tight trails. The long design keeps them stable for racing.

Freestyle dropouts

All the steel dirt frames are coming with freestyle dropouts. This allows the use of pegs without hurting the frame and they protect the freewheel and chain from damage.

BMX Thrasher Geometry

Frame size	Expert	Pro
Head angle	73.5	73.5
Seat angle	71.0	71.0
MM		
Standover		
Seat tube	229	229
Head tube	100	100
Eff. top tube	545	545
Chainstay	368	375
BB height	297	297
Fork offset	33	33
Trail	42	42
Wheelbase	912	949
INCH		
Standover		
Seat tube	9.0	9.0
Head tube	3.9	3.9
Eff. top tube	21.5	21.5
Chainstay	14.5	14.8
BB height	11.7	11.7
Fork offset	1.3	1.3
Trail	1.7	1.7
Wheelbase	35.9	37.4

Mechanic's Specs and Notes

Seatpost diameter	25.4mm
Seatclamp diameter	28.6mm
Headset size TR-20, 30	25.4/34.0/30.0
TR-10	21.2/32.5/26.4
Fork length	282mm
Bottom bracket	68mm Unthreaded
Rear hub OLD	110mm
Cable stops	Top tube housing guides
Bottle mounts	No
Rack mounts	No

Intensity: Jumping
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Professional

TR-30 Jumping

Our Price

Frameset	Cro-Moly steel
Main tubes	Cro-Moly steel
Stays	Cro-Moly steel
Fork	Cro-Moly, 1 3/8" tapered
Headset	Dia-Compe SE-1 Aheadset
Handlebars	Trek Cro-Moly
Stem	Trek BMX, direct connect
Grips	Bontrager BMX
Front brake	Dia-Compe 990 U-brake
Rear brake	Dia-Compe 990 U-brake
Brake levers	Chang Star 281DT
Crankset	1-pc. Cro-Moly, 2 pc. spider/ring
Bottom bracket	One-piece type, 24 TPI
Pedals	Alloy BMX, 1/2" axle
Cassette	16
Chain	Taya TB-410, 90 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 48° 4x, 183
	Rear 48° 4x, 182/183 (D/ND)
Saddle	Bontrager FS10 BMX
Seatpost	Alloy
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	KT alloy
Rear hub	KT alloy
Front tire	Bontrager Revolt ST-2, 20 x 2.1
Rear tire	Bontrager Revolt ST-2, 20 x 1.75
Spokes	14G
Tubes	Schraeder valve

- Pro size geometry- full race design, adds stability
- Cro-Moly frame- durable for all styles of BMX riding and racing
- Oversize tubing, steering system- stiff and strong
- Double thick dropouts- Stiff rear end for racing, and accessories
- 1 3/8" tapered forks- extra strong
- Bontrager Mack rims- super tough, 1 3/8" wide to grab tire sidewalls
- Bontrager Revolt tires- fast, great traction
- Bontrager grips- easy on the hands, and with great control
- Bontrager saddle- comfortable, doesn't get in the way
- Dia-Compe 990 brakes- out of the way, powerful stoppers
- Direct connect stem- light, strong

Additionals

Colors	Flat Black • Khaki Green decal

Bike sizes	Pro
Handlebar width	685
Handlebar rise	190
Stem length	50/0°
Crank length	180
Seatpost length	300
Steerer length	162
MM Reach	593
Handlebar height	750
IN Reach	23.3
Handlebar height	29.5

TR-20

Our Price $_____

Intensity: Jumping
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Competitive

Frameset	Hi Tensile steel w/Cro-Moly down tube
Main tubes	Hi Tensile steel w/Cro-Moly down tube
Stays	High tensile steel
Fork	1 3/8" tapered
Headset	Dia-Compe SE-1 Aheadset
Handlebars	Trek
Stem	Trek BMX, direct connect
Grips	Bontrager BMX
Front brake	CS VB911DK, direct pull
Rear brake	CS VB911DK, direct pull
Brake levers	Chang Star 281DT
Crankset	1-pc. Cro-Moly, 2 pc. spider/ring
Bottom bracket	One-piece type, 24 TPI
Pedals	Alloy BMX, 1/2" axle
Cassette	16
Chain	Taya TB-410, 90 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 186 Rear 36° 3x, 183 (D/ND)
Saddle	Bontrager FS10 BMX
Seatpost	Steel
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	Formula
Rear hub	Formula
Front tire	Bontrager Revolt ST-2, 20 x 2.1
Rear tire	Bontrager Revolt ST-2, 20 x 1.75
Spokes	14G
Tubes	Schraeder valve

- Expert size geometry- fits more riders as they grow
- Cro-Moly down tube- strong and light
- Oversize tubing, steering system- stiff and strong
- Double thick dropouts- Stiff rear end for racing, and accessories
- 1 3/8" tapered forks- extra strong
- Bontrager Mack rims- super tough, 1 3/8" wide to grab tire sidewalls
- Bontrager Revolt tires- fast, great traction
- Bontrager grips- easy on the hands, and with great control
- Bontrager saddle- comfortable, doesn't get in the way
- Direct pull brakes- powerful stoppers
- Direct connect stem- light, strong

Additionals

Colors Metal Flake Yellow/ Black fork • Red decal
Chrome/ Black fork • Red decal

Bike sizes	Expert
Handlebar width	685
Handlebar rise	190
Stem length	50/0°
Crank length	175
Seatpost length	300
Steerer length	162
MM Reach	593
Handlebar height	745
IN Reach	23.3
Handlebar height	29.3

TR-10

Our Price $_____

Intensity: Jumping
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Recreational

Frameset	Hi Tensile steel
Main tubes	High tensile steel
Stays	High tensile steel
Fork	1 3/8" tapered
Headset	Steel
Handlebars	Trek
Stem	Trek BMX
Grips	Bontrager BMX
Front brake	CS VB911DK, direct pull
Rear brake	CS VB911DK, direct pull
Brake levers	Chang Star 289D
Crankset	1-pc. type, 2 pc. spider/ring
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, 1/2" axle
Cassette	16
Chain	Taya TB-410, 90 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 186 Rear 36° 3x, 183 (D/ND)
Saddle	Bontrager FS10 BMX
Seatpost	Steel
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	Formula
Rear hub	Formula
Front tire	Bontrager Revolt ST-2, 20 x 2.1
Rear tire	Bontrager Revolt ST-2, 20 x 1.75
Spokes	14G
Tubes	Schraeder valve

- Expert size geometry- fits more riders as they grow
- Oversize tubing, steering system- stiff and strong
- Double thick dropouts- Stiff rear end for racing, and accessories
- 1 3/8" tapered forks- extra strong
- Bontrager Mack rims- super tough, 1 3/8" wide to grab tire sidewalls
- Bontrager Revolt tires- fast, great traction
- Bontrager grips- easy on the hands, and with great control
- Bontrager saddle- comfortable, doesn't get in the way
- Direct pull brakes- powerful stoppers

Additionals

Colors Metal Flake Blue/ Black fork • Red decal
Chrome/ Black fork • Lime Green decal

Bike sizes	Expert
Handlebar width	685
Handlebar rise	190
Stem length	50/0°
Crank length	170
Seatpost length	300
Steerer length	138
MM Reach	565
Handlebar height	775
IN Reach	22.2
Handlebar height	30.5

BMX Racing

Racing and trail riding.

The aluminum Y-frame has evolved. Using the tried and true alloy Y-frame tubing, Trek has designed a new frame that is even stronger and more dependable. 6061 T6 aluminum throughout, this hot new shape is combined with a new head tube gusset and rear dropouts. The Trek chainstay yoke and monostay shorten the seatstays and chainstays for a stiff rear triangle. Machined chain adjusters get perfect wheel alignment and lock the wheel into the dropout. All to make a frame that will race ahead of the best of them and still take the abuse of BMX's changing riding styles.

The race bikes come equipped with the Bontrager parts package to match the strength of the new frames and to give them a great new look.

BMX Racing Geometry

Frame size	Pro	Pro XL
Head angle	73.5	73.5
Seat angle	71.0	71.0
MM		
Standover		
Seat tube	275	275
Head tube	110	110
Eff. top tube	566	566
Chainstay	387	387
BB height	292	292
Fork offset	26	26
Trail	49	49
Wheelbase	921	940
INCH		
Standover		
Seat tube	10.8	10.8
Head tube	4.3	4.3
Eff. top tube	22.3	22.3
Chainstay	15.2	15.2
BB height	11.5	11.5
Fork offset	1.0	1.0
Trail	1.9	1.9
Wheelbase	36.3	37.0

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	24.9mm
Headset size	25.4/34.0/30.0
Fork length	282mm
Bottom bracket	68mm Unthreaded
Rear hub OLD	110mm
Chain length	92L
Cable stops	Top tube housing guides
Bottle mounts	No
Rack mounts	No

Intensity: BMX
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Professional

TI 3 Wade Bootes

Our Price $_____

Frameset	6061 T6 TIG aluminum
Main tubes	6061 T6 TIG aluminum
Stays	6061 T6 TIG aluminum
Fork	Cro-Moly, 1 3/8" tapered
Headset	Dia-Compe SE-1 Aheadset
Handlebars	Trek Cro-Moly
Stem	Trek BMX, direct connect
Grips	Bontrager dual density
Front brake	CS VB911DK, direct pull
Rear brake	CS VB911DK, direct pull
Brake levers	Chang Star 281DT
Crankset	3-pc. Cro-Moly, Trek ring, 44T
Bottom bracket	3-piece type, sealed cartridge, 24 TPI
Pedals	Platform, alloy, 9/16" axle
Cassette	16
Chain	Taya EB-410, 92 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 184
	Rear 36° 3x, 183/183 (D/ND)
Saddle	Bontrager FS10 BMX
Seatpost	Bontrager Comp
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	Trek, alloy
Rear hub	Trek, alloy
Front tire	Bontrager Revolt ST-2, 20 x 2.125
Rear tire	Bontrager Revolt ST-2, 20 x 1.75
Spokes	14G
Tubes	Schraeder valve

- Pro XL geometry- full race design, adds stability
- Alloy Y frame- super fast, strong
- Oversize tubing, steering system- stiff and strong
- Double thick dropouts- Stiff rear end for racing, and accessories
- 1 3/8" tapered forks- extra strong
- 3 piece crank- light and strong
- Bontrager Mack rims- super tough, 1 3/8" wide to grab tire sidewalls
- Bontrager Revolt tires- fast, great traction
- Bontrager grips- easy on the hands, and with great control
- Bontrager saddle- comfortable, doesn't get in the way
- Direct pull brakes- powerful stoppers
- Direct connect stem- light, strong

Additionals

Colors Metallic Red/ Chrome fork • Black decal

Bike sizes	Pro
Handlebar width	680
Handlebar rise	190
Stem length	50/0°
Crank length	180
Seatpost length	350
Steerer length	178
MM Reach	614
Handlebar height	764
IN Reach	24.2
Handlebar height	30.1

TI 2

Our Price $_____

Intensity: BMX
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Professional

Frameset	6061 T6 TIG aluminum
Main tubes	6061 T6 TIG aluminum
Stays	6061 T6 TIG aluminum
Fork	Cro-Moly, 1 3/8" tapered
Headset	Dia-Compe SE-1 Aheadset
Handlebars	Trek Cro-Moly
Stem	Trek BMX, direct connect
Grips	Bontrager dual density
Front brake	CS VB911DK, direct pull
Rear brake	CS VB911DK, direct pull
Brake levers	Chang Star 281DT
Crankset	1-pc. Cro-Moly, 2 pc. spider/ring, 44T
Bottom bracket	One-piece type, 24 TPI
Pedals	Alloy BMX, 1/2" axle
Cassette	16
Chain	Taya EB-410, 92 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 185 Rear 36° 3x, 184/184 (D/ND)
Saddle	Bontrager FS10 BMX
Seatpost	Bontrager Comp
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	Trek, alloy
Rear hub	Trek, alloy
Front tire	Bontrager Revolt ST-2, 20 x 2.125
Rear tire	Bontrager Revolt ST-2, 20 x 1.75
Spokes	14G
Tubes	Schraeder valve

- Pro XL geometry- full race design, adds stability
- Alloy Y frame- super fast, strong
- Oversize tubing, steering system- stiff and strong
- Double thick dropouts- Stiff rear end for racing, and accessories
- 1 3/8" tapered forks- extra strong
- Alloy hubs- light, long lasting
- Bontrager Mack rims- super tough, 1 3/8" wide to grab tire sidewalls
- Bontrager Revolt tires- fast, great traction
- Bontrager grips- easy on the hands, and with great control
- Bontrager saddle- comfortable, doesn't get in the way
- Direct pull brakes- powerful stoppers
- Direct connect stem- light, strong

Additionals

Colors Metal Flake Yellow/ Chrome fork • Black decal

Bike sizes	Pro XL
Handlebar width	680
Handlebar rise	190
Stem length	50/0°
Crank length	180
Seatpost length	350
Steerer length	178
MM Reach	614
Handlebar height	764
IN Reach	24.2
Handlebar height	30.1

TI 1

Our Price $_____

Intensity: BMX
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Professional

Frameset	6061 T6 TIG aluminum
Main tubes	6061 T6 TIG aluminum
Stays	6061 T6 TIG aluminum
Fork	1 3/8" tapered
Headset	Dia-Compe SE-1 Aheadset
Handlebars	Trek
Stem	Trek BMX, direct connect
Grips	Bontrager BMX
Front brake	CS VB911DK, direct pull
Rear brake	CS VB911DK, direct pull
Brake levers	Chang Star 281DT
Crankset	1-pc. Cro-Moly, 2 pc. spider/ring
Bottom bracket	One-piece type, 24 TPI
Pedals	Alloy BMX, 1/2" axle
Cassette	16
Chain	Taya EB-410, 92 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 186 Rear 36° 3x, 183 (D/ND)
Saddle	Bontrager FS10 BMX
Seatpost	Alloy
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	Trek, alloy
Rear hub	Trek, alloy
Front tire	Bontrager Revolt ST-2, 20 x 2.1
Rear tire	Bontrager Revolt ST-2, 20 x 1.75
Spokes	14G
Tubes	Schraeder valve

- Pro geometry- race design, fits more riders
- Alloy Y frame- super fast, strong
- Oversize tubing, steering system- stiff and strong
- Double thick dropouts- Stiff rear end for racing, and accessories
- 1 3/8" tapered forks- extra strong
- Alloy hubs- light, long lasting
- Bontrager Mack rims- super tough, 1 3/8" wide to grab tire sidewalls
- Bontrager Revolt tires- fast, great traction
- Bontrager grips- easy on the hands, and with great control
- Bontrager saddle- comfortable, doesn't get in the way
- Direct pull brakes- powerful stoppers
- Direct connect stem- light, strong

Additionals

Colors Metal Flake Blue/ Chrome fork • Red decal
Bright Green/ Chrome fork • Black decal

Bike sizes	Pro
Handlebar width	685
Handlebar rise	190
Stem length	50/0°
Crank length	180
Seatpost length	300
Steerer length	173
MM Reach	594
Handlebar height	764
IN Reach	23.4
Handlebar height	30.1

BMX Racing/ Cruiser

BMX 24" Cruiser Geometry

Frame size	Pro Cruiser
Head angle	71.5
Seat angle	70.5
MM	
Standover	
Seat tube	278
Head tube	110
Eff. top tube	520
Chainstay	418
BB height	297
Fork offset	33
Trail	67
Wheelbase	1015
INCH	
Standover	
Seat tube	10.9
Head tube	4.3
Eff. top tube	20.5
Chainstay	16.5
BB height	11.7
Fork offset	1.3
Trail	2.6
Wheelbase	40.0

Mechanic's Specs and Notes

Seatpost diameter	27.2mm
Seatclamp diameter	34.9mm
Headset size	25.4/34.0/30.0
Fork length	333mm
Bottom bracket	68mm Unthreaded
Rear hub OLD	110mm
Cable stops	Top tube housing guides
Bottle mounts	No
Rack mounts	No

Intensity: BMX
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Professional

TI 24

Our Price $_____

Frameset	6061 T6 TIG aluminum
Main tubes	6061 T6 TIG aluminum
Stays	6061 T6 TIG aluminum
Fork	Cro-Moly, 1 3/8" tapered
Headset	Dia-Compe SE-1 Aheadset
Handlebars	Trek BMX
Stem	Trek BMX, direct connect
Grips	Bontrager dual density
Front brake	CS VB911DK, direct pull
Rear brake	CS VB911DK, direct pull
Brake levers	Chang Star 281DT
Crankset	One-piece type, 2 pc. spider/ring, 42T
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, alloy, 1/2" axle
Cassette	18
Chain	Taya EB-410, 96 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 36° 3x, 235
	Rear 36° 3x, 234/234 (D/ND)
Saddle	Bontrager FS10 BMX
Seatpost	Alloy
Seat binder	Alloy w/integral bolt
Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	Trek, alloy
Rear hub	Trek, alloy
Front tire	Bontrager Revolt ST-2, 24 x 2.125
Rear tire	Bontrager Revolt ST-2, 24 x 1.75
Spokes	14G
Tubes	Schraeder valve

- Pro geometry- race design, fits more riders
- Alloy Y frame- super fast, strong
- Oversize tubing, steering system- stiff and strong
- Double thick dropouts- Stiff rear end for racing, and accessories
- 1 3/8" tapered forks- extra strong
- Alloy hubs- light, long lasting
- Bontrager Mack rims- super tough, 1 3/8" wide to grab tire sidewalls
- Bontrager Revolt tires- fast, great traction
- Bontrager grips- easy on the hands, and with great control
- Bontrager saddle- comfortable, doesn't get in the way
- Direct pull brakes- powerful stoppers
- Direct connect stem- light, strong

Additionals

Colors	Metallic Red/ Chrome fork • Black decal

Bike sizes	Pro Cruiser
Handlebar width	700
Handlebar rise	164
Stem length	50/0°
Crank length	180
Seatpost length	350
Steerer length	178
MM Reach	627
Handlebar height	822
IN Reach	24.7
Handlebar height	32.4

Freestyle

Life is short, go huge

Freestyle has gotten so much tougher on the bikes, the riders are doing tricks that are huge compared to only a few years ago; the Trek freestyle frames are keeping ahead of the destruction with a massive gusset at the headtube to add strength and _" thick dropouts welded on both the front and back.

Street and ramp riding.

For 1999, our selection of freestyle bikes is wider and it's easier to figure out what bikes fit what types of riding styles.

With the popularity of freestyle exploding, Trek has built four models to fit every riding style, ability and budget. Based on two different frame geometries, street and ramp, we're giving you real freestyle bikes at every price point.

Street

The Vert 1 and Vert 2 are built on the "Street" geometry. A shorter 19 _" top tube and 14 _" stays combined with the 75 degree headtube angle give the bike the quick handling needed for the moves being done by street and ground riders.

Ramp

Our new Vert 3 and Vert 4 get the "Ramp" geometry. 20 _" long top tubes and 14 _" stays with 75 degree headtube and 73 degree seattubes keep the bikes stable for the big Ariel maneuvers.

BMX Freestyle Geometry

Frame size	All-around	Vert 3/4
Head angle	75.0	75.0
Seat angle	74.0	74.0
MM		
Standover		
Seat tube	229	229
Head tube	115	115
Eff. top tube	514	538
Chainstay	368	387
BB height	297	297
Fork offset	33	33
Trail	35	35
Wheelbase	919	940
INCH		
Standover		
Seat tube	9.0	9.0
Head tube	4.5	4.5
Eff. top tube	20.2	21.2
Chainstay	14.5	15.2
BB height	11.7	11.7
Fork offset	1.3	1.3
Trail	1.4	1.4
Wheelbase	36.2	37.0

Mechanic's Specs and Notes

Seatpost diameter	25.4mm
Seatclamp diameter	28.6mm
Headset size, Vert 3, 4	25.4/34.0/30.0
Vert 1, 2	21.1/32.5/26.4
Fork length	280mm
Bottom bracket	68mm Unthreaded
Rear hub OLD	110mm
Cable stops	Top tube housing guides
Bottle mounts	No
Rack mounts	No

Intensity: Freestyle
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Competitive

Vert 1

Our Price $_____

Frameset	Hi Tensile steel
Main tubes	Hi Tensile steel w/Cro-Moly seat tube
Stays	High tensile steel
Fork	1 3/8" tapered
Headset	Steel
Handlebars	Freestyle
Stem	Trek BMX
Grips	Bontrager dual density
Front brake	Freestyle caliper
Rear brake	Freestyle caliper
Brake levers	Chang Star 257A
Crankset	One-piece type, 44T
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, 1/2" axle
Cassette	16
Chain	Taya TB-410, 88 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 48° 4x, 186
	Rear 48° 4x, 175/175 (D/ND)
Saddle	Trek Freestyle
Seatpost	Trek 90°
Seat binder	Alloy w/integral bolt
Front Rim	Aluminum alloy
Rear Rim	Aluminum alloy
Front hub	Steel
Rear hub	Steel
Front tire	20 x 1.9
Rear tire	20 x 1.9
Spokes	14G
Tubes	Schraeder valve

- All Around geometry- neutral handling for all freestyle
- Cro-Moly seat tube- stronger in weld area
- Oversize tubing- stiff and strong
- Grind guard dropouts- protects freewheel and hub while grinding
- 1 3/8" tapered forks- extra strong
- Bontrager grips- easy on the hands, and with great control

Additionals	SST rotor, rear pegs
Colors	Pearl White/ Black fork • Black decal
	Chrome/ Black fork • Black decal

Bike sizes	All-around
Handlebar width	700
Handlebar rise	219
Stem length	50/0°
Crank length	175
Seatpost length	350
Steerer length	147
MM Reach	561
Handlebar height	828
IN Reach	22.1
Handlebar height	32.6

Vert 2

Our Price $_____

Intensity: Freestyle
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Competitive

Frameset	Hi Tensile steel w/Cro-Moly down tube
Main tubes	Cro-Moly steel
Stays	High tensile steel
Fork	Cro-Moly 1 3/8" tapered
Headset	Steel
Handlebars	Freestyle
Stem	Trek BMX
Grips	Bontrager dual density
Front brake	Dia-Compe Bulldog
Rear brake	Dia-Compe 990 U-brake
Brake levers	Chang Star 257A
Crankset	One-piece, 44T
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, 1/2" axle
Cassette	16
Chain	Taya EB-410, 88 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 48° 4x, 162
	Rear 48° 4x, 172/172 (D/ND)
Saddle	Trek Freestyle
Seatpost	Trek 90°
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	KT alloy
Rear hub	KT alloy
Front tire	20 x 1.9
Rear tire	20 x 1.9
Spokes	14G
Tubes	Schraeder valve

- All Around geometry- neutral handling for all freestyle
- Cro-Moly main frame- stronger, lighter
- Oversize tubing- stiff and strong
- Grind guard dropouts- protects freewheel and hub while grinding
- 1 3/8" tapered forks- extra strong
- Bontrager grips- easy on the hands, and with great control

Additionals	SST rotor, Trek pegs front and rear
Colors	Graphite Pearl/ Cream fork • Cream decal
	Chrome/ Cream fork • Cream decal

Bike sizes	All-around
Handlebar width	670
Handlebar rise	200
Stem length	50/0°
Crank length	175
Seatpost length	350
Steerer length	147
MM Reach	561
Handlebar height	810
IN Reach	22.1
Handlebar height	31.9

Vert 3

Our Price $_____

Intensity: Freestyle
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Professional

Frameset	Cro-Moly steel
Main tubes	Cro-Moly steel
Stays	High tensile steel
Fork	Cro-Moly, 1 3/8" tapered
Headset	Dia-Compe SST Aheadset
Handlebars	Freestyle Cro-Moly
Stem	Trek BMX, direct connect
Grips	Bontrager dual density
Front brake	Dia-Compe 990 U-brake
Rear brake	Dia-Compe 990 U-brake
Brake levers	Dia-Compe Tech77
Crankset	1-pc. Cro-Moly, alloy 44T chainring
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, alloy, 1/2" axle
Cassette	16
Chain	Taya EB-410, 88 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 48° 4x, 176
	Rear 48° 4x, 175/175 (D/ND)
Saddle	Trek Freestyle
Seatpost	Trek Cro-Moly 90°
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	KT alloy, 14mm axle
Rear hub	KT alloy, 14mm axle
Front tire	20 x 1.9
Rear tire	20 x 1.9
Spokes	14G
Tubes	Schraeder valve

- All Around geometry- neutral handling for all freestyle
- Cro-Moly main frame- stronger, lighter
- Oversize tubing, steering system- stiff and strong
- Grind guard dropouts- protects freewheel and hub while grinding
- 1 3/8" tapered forks- extra strong
- Bontrager grips- easy on the hands, and with great control
- Bontrager mack rims- super strong, 1 3/8" wide for tire control
- Dia-Compe 990 brakes- powerful stoppers, tucked out of the way
- Direct connect stem- strong and light

Additionals	SST rotor, Trek pegs front and rear
Colors	Cream/ Black fork • Black decal

Bike sizes	All-around
Handlebar width	670
Handlebar rise	200
Stem length	50/0°
Crank length	175
Seatpost length	350
Steerer length	174
MM Reach	586
Handlebar height	772
IN Reach	23.1
Handlebar height	30.4

Vert 4

Our Price $_____

Intensity: Freestyle
Surface types: Off road
Topography: Flat
Distance: Local
Spec level: Professional

Frameset	Cro-Moly steel
Main tubes	Cro-Moly steel
Stays	Cro-Moly steel
Fork	Cro-Moly, 1 3/8" tapered
Headset	Dia-Compe SST Aheadset
Handlebars	Freestyle Cro-Moly
Stem	Trek BMX, direct connect
Grips	Bontrager dual density
Front brake	Dia-Compe 990 U-brake
Rear brake	Dia-Compe 990 U-brake
Brake levers	Dia-Compe Tech77
Crankset	1-pc. Cro-Moly, alloy 44T chainring
Bottom bracket	One-piece type, 24 TPI
Pedals	Platform, alloy, 9/16" axle
Cassette	16
Chain	Taya TB-410, 88 length, 1/8"
Rim strips	Rubber
Spoke lengths	Front 48° 4x, 176
	Rear 48° 4x, 175/175 (D/ND)
Saddle	Freestyle padded
Seatpost	Trek Cro-Moly 90°
Seat binder	Alloy w/integral bolt

Front Rim	Bontrager Mack
Rear Rim	Bontrager Mack
Front hub	KT alloy, 14mm axle
Rear hub	KT alloy, 14mm axle
Front tire	20 x 1.9
Rear tire	20 x 1.9
Spokes	14G
Tubes	Schraeder valve

- All Around geometry- neutral handling for all freestyle
- Full Cro-Moly frame- super strong, lighter
- Oversize tubing, steering system- stiff and strong
- Grind guard dropouts- protects freewheel and hub while grinding
- 1 3/8" tapered forks- extra strong
- Bontrager grips- easy on the hands, and with great control
- Bontrager mack rims- super strong, 1 3/8" wide for tire control
- Dia-Compe 990 brakes- powerful stoppers, tucked out of the way
- Direct connect stem- strong and light

Additionals SST rotor, Trek pegs front and rear

Colors Metal Flake Green/ Black fork • Black decal

Bike sizes	All-around
Handlebar width	695
Handlebar rise	195
Stem length	50/0°
Crank length	180
Seatpost length	350
Steerer length	174
MM Reach	586
Handlebar height	772
IN Reach	23.1
Handlebar height	30.4

Creaking seatposts on 1998 Alpha framesets

Some ATBs from last year exhibit an annoying creak that happens when the seatpost is loaded. This comes from slight movement between the seat tube and the seat lug. Yes, there is a small lug that is inserted into the seat tube. This gives us a large area of thick aluminum to weld to. However, on some bikes the seat tube rubs on the lug, and that's where the noise comes from.

To fix this, first remove the seatpost. Tip the frame on its side, and put a few drops of Loctite 290 (red) into the seat tube by running it down a spoke.

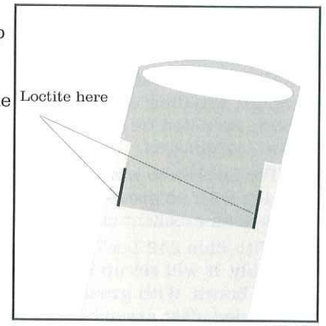


Fig. 28

Then turn the bike upside down and thoroughly wipe out any excess Loctite. If you leave Loctite in the seat tube, it can mar or scratch the seatpost when inserted.

After cleaning the frame, let it sit upside down overnight while the Loctite cures. Reinstall the seatpost, and the squeak will be gone.