GARY FISHER 2003

Technology stories

Bike technical info, geometry, and specifications

For the mechanic (appendix)

LEMOND 2003

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A BRIEF HISTORY OF OFF-ROAD RIDING

1963

Gary Fisher was an active cyclist at a youthful age. At age 12, Gary started competing on both the road and track. The following year, he discovered cyclo-cross racing. He also finished 2nd in the Intermediate age group at the Northern California Road Championships.

1968

Several years later Gary was suspended from bike racing because his hair was too long. As an alternate outlet for his energy, he built a light show, and played major rock venues around San Francisco.

1972

The "long hair" rule was overturned, and Gary commenced road racing.

1973

Gary's finishes were good enough for him to become a Category 1 USCF road racer.

1974

It was for this busy time that Gary Fisher would become known as "The Father of Mountain Biking". He earned the title through a series of events.

Gary, his friends and their fat-tired bikes were attempting to ride in the hills near his house in Marin County, California. Due to the heavy-duty nature of their bikes (about 42 pounds of duty), they spent 20% of their time in the hills riding, and 80% pushing. Gary wanted to reverse the ratio. He put some wide range gearing and Tandem drum brakes, along with motorcycle levers, longer cranks, and a seatpost quick release, on an old 1930's newsboy bike fondly known as "The Clunker". Its wide gear range and heavy duty braking make it the first true off-road bike; ridable up mountains as well as down. A new sport was born.

1975

Gary was busy helping his roommate, Charlie Kelly, stage the Repack off-road downhill race series. To get even more involved in cycling, Gary began writing a monthly road test article for *Bicycling Magazine*.

1976

Gary's early road racing results were followed by bigger successes. Gary won the Tour of Klamath Lake, a 125 mile Olympic development race. He also placed 12th in the national road championships.

1977

Gary kept road racing. Gary finished fifth in the National Cyclo-cross championships and finished the Red Zinger stage race in Colorado.

Off road, Gary set the Repack record of 4:22:14, a record that still stands.

1979

Gary started his own bike business. He did a "bad job" at trademarking the name "MountainBikes". His brand name rapidly became the generic term for the sport. That first year he made just 165 bikes, but at the time those few bikes comprised 85% of the market share.

1980

Gary's business pushed out 1000 bikes. That's a pretty steep growth curve.

Gary coins the term "Bullmoose handlebar" which he did trademark. Gary is the first to use a Shimano freehub and "Bear Trap" pedals on a mountain bike.

Also in 1980 he won every cross-country mountain bike race held in California, including the Reseda to the Sea off-road race.

Gary and Charlie Kelly edit the bicycle section of the "Last Whole Earth Catalog".

1981

Gary wins the second Reseda to the Sea off-road race. Gary wins the first Rockhopper Off-Road Race and sets the stage for Fisher riders to claim the next six. Gary wins the Paradise Divide Criterium in Crested Butte, Colorado.

Fisher sponsors a women's team in the Coors Classic stage race.

1983

The National Off Road Biking Association better known as NORBA was born in the living room of Charlie Kelly at Jack Ingram's insistence. Gary was one of the founding members.

1984

Gary develops and names the Unicrown fork. Fisher has the first production bike with a brake under the chainstay. Gary

introduces short chainstays and steeper seat angles to mountain bikes. Gary designs and builds the first mountain bike using Tange Prestige tubing. The Fisher Excalibur is the first production mountain bike with a Dura Ace freehub, toe clips and straps.

The first US National Championship for mountain bikes was held. Fisher fields a team for the Nationals, including Dale Stetina, Eric Heiden, Joe Murray, Tom Ritchey and John Loomis. Loomis is the top Fisher finisher in third place.

Fisher racer Dale Stetina wins the Paradise Divide Stage Race. Team Fisher riders win 70% of all off-road races held.

Gary goes to France to introduce the mountain bike, racing downhill in the La Plagne Alps.

1985

Fisher Team riders work with Shimano to develop indexed shifting. Gary develops "Standover height" and "Effective top tube length" measurements to better describe off-road frame fit.

1986

Fisher starts a grass roots racing team - the largest off-road racing team in the world. Gary sells the name "Marin Mountain Bikes" to Bob Buckley.

1987

Fisher bikes win a World Championship under team member Sara Ballantyne. The Fisher Procaliber is voted one of the "Top Ten All-Time Best Mountain Bikes" by Mountain Bike Action Magazine. Gary is named by Outside Magazine as one of "50 Who Left Their Mark" in the last ten years.

1988

The innovative Fisher CR-7 is introduced combining Gary's renowned frame design and Richard Cunningham's expertise at joining aluminum and chrome-moly. Bicycle Guide Magazine names the titanium Fisher Prometheus the "Best of 88". Gary is inducted at the inaugural Mountain Bike Hall of Fame in Crested Butte.

1989

Gary introduces the Evolution headset, tubing and seatpost, the first oversize component system for off-road bikes. Bicycle Guide magazine names the Fisher Gemini Tandem "Best of 89". Fisher produces its first hybrid bicycle.

Fisher rider Sara Ballantyne wins her third world championship.

1990

Gary's collaboration with Mert Lawwill on the RS-1 full suspension bike wins Bicycling Magazine's "Hot Bike" award. The Fisher Mt. Tam is the first production mountain bike with a front suspension fork (RockShox) and suspension ready geometry.

1991

Gary introduces 15.5" chainstays on the Montare.

Fisher starts it's international mountain bike team, including world champions Albert Iten and Walter Braendli of Switzerland and Paola Pezzo and Paolo Rusola of Italy.

1992

Gary develops the Alembic carbon fiber suspension bike with Toray of Japan.

1993

Trek Bicycle Corporation acquires the Gary Fisher Bicycle Company. The new Gary Fisher brand is launched in September with its most competitive range ever, including 10 models manufactured in the United States. Fisher rider Paola Pezzo of Italy wins the UCI World Mountain Bike Championship in France.

1994

Gary is named the "Founding Father of Mountain Bikes" by Smithsonian magazine. Gary receives a lifetime achievement award at the Korbel Night of Champions, cycling's Academy Awards.

1996

Fisher rider Paola Pezzo wins the gold medal for mountain bikes at the Atlanta Olympic Games. Gary designs the Joshua dual suspension bike, the Joshua later becomes the most copied design of the 90's. Gary develops "Genesis Geometry" the first significant geometry change in mountain biking since 1987. The Fisher brand is the fastest growing bicycle brand in the U.S.A.

1997

Fisher starts a BMX team and introduces 10 BMX models including a Joshua-inspired aluminum Pro Issue team frame. Paola Pezzo dominates the Women's XC field on her Genesis geometry bicycle by winning seven of nine Grundig World Cup races, including the overall championship and the World Championship title. Gary himself has an incredible year in the racing scene, winning the Masters Cross Country category at the U.S. National Championships and earning a spot on the U.S. Masters team.

1998

Fisher shows the bike world that dramatic improvements to mountain bike frames are still possible by unveiling Genesis geometry and makes it available to consumers around the globe. Gary wins the Trans Alp 8 day off road stage race in Europe.

1999

Fisher rider Michael Rasmussen wins the men's Cross Country event at the World Championships.

2000

Fisher introduces the Sugar, the full-suspension platform that's light enough to be raced professionally. "Popular Mechanics" names Gary one of the century's top sports innovators. American rider Walker Fergerson, riding a Fisher, wins the Junior world championships. Fisher has the worlds top women's mountain bike team on the cross country circuit, crowned by Paola Pezzo's second Olympic gold win at the Sydney games.

2001

Fisher introduces Genesisters geometry on both hardtails and full suspension bikes to the applause of performance-oriented female mountain bikers worldwide.

Fisher riders have another excellent year on the mountain bike circuit with both female and male podium visits.

2002

Gary popularizes the new 29" wheel format.

2003

Gary brings 29" wheels to full suspension.

2004

Who knows what Gary will come up with next? As usual, he's spending a lot of time riding, racing, and just hanging out with riders around the world. Chances are, whatever it is, it will be very cool.

Gary met his wife Belle over 20 years ago, when she came to his house with her boyfriend to buy a part for a bike. They have two kids, Rachel (17) and Nick (15). When he's not on his bike or traveling the world to promote the sport, Gary's into collecting art; paintings, sculpture, modern and folk art.

GENESIS GEOMETRY

Gary rides. A lot.

Gary Fisher does a lot of bike riding. He has for years. He holds the RePack record, and won the National Mountain Bike Championship for Masters in 1997. Basically what we're saying is this; Gary has skills.

Inspiration doesn't always come easy

So one day this skilled rider is out for an epic ride on his favorite bike. He's cruising down a hill, not terribly tricky or anything, when he gets one of those free flying lessons and as he's laying on the ground he's wondering "What happened?"

So he picks himself up off the ground only to find that he's broken his wrist. Not a big deal, but nothing he really wanted. During the next few weeks of recovery Gary has time to think about his little accident and the bike. And that's how Genesis was born.

Whu' happened?

Gary analyzed the accident. He had simply been too far forward and pitched over the front wheel. The pivot point of his flip was the front axle. If the axle were further forward, he might have stayed upright.

If we look back in time, we see that Gary had worked on geometry for years. Years ago, he even had a fully adjustable bike. It had adjustable dropouts so you could change the wheelbase, chain stays, or fork rake. It had an adjustable head tube to change the head angle. Basically, you could try any geometry you wanted as long as the top tube stayed the same length. Using that bike, Gary developed what we now call "classic NORBA geometry" with a 71 degree head angle and 73 degree seat angle.

Gary knew that changing the fork offset or head angle to move the front axle would make a bike handle poorly. The only way to get the front axle forward was to lengthen the top tube. But he didn't want to move the bars forward and change his position. He'd have to use a little short stem.

Gary defies convention

Common knowledge said that a short stem would handle weird. In a typical unconventional Gary Fisher way, he ignored common knowledge and built a prototype with a really long top tube. The genius here is that he didn't change his position on the bike, only the orientation of the bike's parts. Since he had moved the headset forward considerably, he had to use a 75mm stem to replace the 135mm stem he normally used. This setup added 60mm of top tube, moving the front axle 60mm forward, almost 21/2 inches. And it worked!

This first prototype was a revelation. But Gary knows the bike to be an organism, where everything affects everything else. He had developed enough frame designs to know that he had just scratched the surface and that every dimension on the bike, from chain stays to seat angle, could benefit from the increased front center. But instead of telling you that long story of test riding and prototypes, let's just skip to the finished Genesis frame and what defines it today.

Genesis advantages

The primary benefit of the long front/center (distance from the bottom bracket to the front axle) is stability. This certainly helps in conditions like those that caused Gary to crash. But the long front/center makes the bike more stable all the time.

Short stems steer great

The shorter stem used with Genesis geometry puts your hands closer to the steering axis. Steering can be done with your arms instead of a sweeping sideways movement of your shoulders. Your hands can move faster than your shoulders, and with more control of fine movements, so technical steering is precise at high speed.

Centered between the wheels

On a bike with a long front-center the front wheel is pushed further ahead of you. Anytime you find yourself moving back on your bike, it's 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. With the front axle moved forward, there is 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 position to keep the pedal power on.

Climbing prowess

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 Genesis bikes actually climb very well.

Here's two reasons why: with a shorter stem, your 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 Genesis geometry, it's 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. As you jam on the pedals, 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 (headset), and the closer to your hands, the straighter the bike will climb. With the shorter stem, you stay over the bike, and the bike tracks straighter, making it climb very well indeed.

Short chain stays

Genesis bikes use ultra-short chainstays. This positions the rear wheel more directly under your butt. With more weight on the rear wheel, you get better traction uphill, and the tire bites better when you apply the rear brake.

Short chainstays also moves the pivot point for doing wheelies. With a Genesis bike, you can easily lift the front wheel when it's time to bunny hop a water bar or climb over a small log.

Steep seat tube

Genesis bikes, like most Fisher models, have a steep seat tube angle. The duty, and the effect, of the seat angle is to place the saddle where you need it for support when seated pedaling. The seat angle also interacts with the top tube length to describe the position of the head tube relative to the bottom bracket. For every degree of seat angle, the top tube is compensated about 10mm. In other words, for every degree the seat tube is steepened, the top tube becomes about 10mm shorter. When comparing geometry charts, a bike with a steep seat tube may look like it has a shorter top tube than it actually does.

The function of the steep seat tube is to place the rear wheel more underneath you. This is useful when you transfer from a seated to a standing position. As you move from a seated to a standing position (or the opposite), you don't have to move as much to maintain traction. It becomes easier for you to 'attack' a climb.

Genesis works for everyone

The features of Genesis geometry were originally dreamed up by Gary Fisher, for his own riding. As we point out in *"Gary Fisher: A History,"* Gary has done a lot of racing. But the same benefits that get a racer around a course faster will also add pleasure to a leisurely ride on the weekend.

Genesis bikes are more stable, especially in more technical terrain or on steep downhills. Genesis bikes allow quick, precise steering. Genesis bikes climb really well, especially for those who like to stand out of the saddle.

With these features, Genesis bikes offer a superior ride to anyone looking for performance off the pavement.

WOMEN ON BIKES

Most bikes are built for men

For years women have been riding bikes designed partly, if not totally, for men. If you were one of the lucky ones, your dealer substituted a few parts which made a men's bike work pretty well for you, especially if you are a taller woman.

Adaptation and adjustability

Fitting bikes is a combination of adjusting a bike and adapting the rider.

Larger bike are more adjustable, since their stem lengths are usually of average length and rise. Changing to a shorter stem reduced the reach to the bars, and changing stem angle on a mid-length or longer stem could significantly effect handlebar height. On a small bike, the stem is likely to be quite short to begin with. If an even shorter stem is desired, the right extension may not exist. Changing the rise angle of a very short stem has little effect on handlebar height so vertical adjustment is not readily available, either.

When analyzing movement of a person, the range of motion is critical to efficiency and power. If you move a fit component on a bicycle a given amount, it will effect the range of motion of a person with shorter limbs more than a person with longer limbs. Simply put, when fitting a bike a shorter person has less adaptability than a taller person. Smaller bikes generally have less adjustability than big bikes, so it's more important that a small bike fit just right.

Smaller women rider smaller bikes. With less available adjustment on their bikes, and less adaptability of their bodies, small women have suffered fit problems that lead to performance gaps. Serious riding on the road is much more fun when your bike is comfortable and handles well. Off road, anything less can make cycling really unpleasant.

More than a dropped top tube

The new Gary Fisher Genesisters and LeMond women's bikes are spec'd with women's specific components, like saddles, bars, and crank lengths. The Genesisters mountain bikes have women's specific suspension forks with softer springs.

More importantly, these frames feature a geometry designed for women. So while most 'women's' bikes make due by just tweaking a men's 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 of these is the difference in 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. For the smaller woman on a man's machine, this means her lower back is curved and the handlebars are hard to reach.

Adjusting geometry to fit women

Fisher and LeMond engineers addressed these issues in several ways in the Genesisters and LeMond women's geometry. To support their wider pelvis, women appear to sit further back on the saddle. With a steeper seat tube, the seat can be positioned placing the legs 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 placed higher by using a taller head tube, so her back and arms can be at a relaxed angle for steering control and shock absorption.

These adjustments put a woman 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.

Some of the corrections Fisher made to these frames can be made to a men's frame with similar results, especially with a taller woman's bike where there is more adjustment. 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. The result is less steering stability and the bike becomes harder to control.

Steering and weight distribution

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. 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.

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.

BIKE FIT

Good fit defined

When pedaling a bicycle, you touch the bike in three places; pedals, saddle, and handlebars. For the bike to fit you properly, these three points must interface with your body in a comfortable and functional way. In other words: if the saddle, pedals (and shoes), and handlebars (plus grips and controls) do not fit your feet, hands and seat, the bike won't work its best for you.

The three points of contact must be oriented correctly for you to benefit. Properly oriented, your muscles will work at their optimum. No muscles, ligaments, or tendons will be strained. Aerodynamic drag will be at a minimum. With a well fitted bike, you do not need to squirm around, nor do you have excess tension in your shoulders, arms, or anywhere else. Basically, you are comfortable, first and foremost.

In addition to the relatively simple task of accommodating your body for comfort, proper position makes a bike ride better. Your center of mass should be positioned over the bike to accentuate your pedaling power while also balancing you over the wheels for the best bike handling.

Using the fit info in this manual

On the specifications page for each bike model, we have listed the fit items for that model, including the lengths, angles, or widths of the handlebar, stem, crank, and seatpost.

Selecting your size

In addition to the measurements of the hard parts, we list Rider Height. This dimension is the height of the average rider who might fit this bike in an average way, with its handlebars at their highest position. That's a lot of qualifiers, but the information can still be valuable in helping you quickly fit a given model. Some models do not include Rider Height, either because that model offers too much fit adjustment to be defined, or simply because it's a one-size-fits-all.

When using the Rider Height, bear in mind this is the average tallest rider. Since it's an average, a bike with a Rider Height listed as 70 inches, without moving the handlebars, will likely fit people within a range of 68 to 72 inches. Moving the handlebars changes the fit. As the handlebars get closer to the pedals, the bike will fit a shorter person.

The actual range offered by each model varies. The more bent-over the position, the smaller the range of fit. In other words, a road bike designed for a serious racer has a narrower fit range than a mountain bike with a more upright position. An upright position, like a comfort bike or hybrid, offers an even wider fit range.

Highest handlebar position

We made each fit estimation with the handlebar at its highest point. With an Ahead stem, that means all the spacers were under the stem, and the stem was angled up. With quill stems, the handlebar reaches its maximum height with the stem pulled up to the minimum insertion line. With a stem having an adjustable angle, the handlebar position is calculated with the stem at a 35 degree angle. Lowering the bars, or changing the parts, changes the fit of the bike, as well as the Rider Height of that bike.

Average riding style

When we design or spec a bike, we have a certain style of riding in mind. As an example, when we spec a Supercaliber, we're expecting that the bike will be either ridden by a racer, or someone who likes to ride like a racer. That doesn't mean you can't ride a Supercaliber on the bike path, but someone buying a Supercaliber exclusively for bike path riding isn't riding in an average way for that model, and will likely want to tune the fit to their purposes.

Average fit

We've studied a lot of riders over the years, and we have drawn some conclusions about the way a bike fits the average person. But some folks aren't average. Those with specific preferences, injury, or other abnormalities may require or prefer a non-average fit. As examples, consider two people of the same height but different weight. At 6' tall, a 130 pound person will sit on a bike differently than someone also 6' tall who weighs 260. Incidentally, neither of these folks would fit our definition of average.

Is aluminum a new material?

It should be common knowledge that most modern aircraft use aluminum exclusively for their primary structures (internal frames and bulkheads) and 95% or better of their exterior surfaces, including load bearing skins. The aircraft industry has been using these alloys for many decades. The aircraft companies have picked aluminum because it offers the best combination of material properties and processing capability in order to create high performance, light weight, robust aircraft. So aluminum alloys have certainly proved their long term durability and high performance in the aircraft industry. The occasional failure that has occurred has typically been due to a design or manufacturing defect or improper maintenance.

Doesn't steel resist fatigue better than aluminum?

Occasionally we hear fatigue failure erroneously described as similar to the result of bending a coat hanger back and forth. This example is not relevant to the durability or reliability of a bicycle frame. When you permanently deform the coat hanger you are yielding it. This has no relation to fatigue strength. Some of the highest fatigue strength materials (like carbon composite) will not take a significant permanent set, instead breaking at a high force level. So carbon fibers, with extremely high fatigue strength, would rate near zero in the coat hanger test.

Compared to the better aluminum alloys, a high strength steel alloy will exhibit a longer fatigue life at a high, fully reversing load level. But remember, these numbers always reflect performance for a unit volume. Steel weighs 3 times as much as aluminum for the same volume. In other words, if these statistics were based on weight instead of volume, steel would have to exhibit 3 times the fatigue strength of aluminum to be considered stronger. It doesn't. Steel is only the better material if you don't care how much your bike weighs.

What are the benefits of aluminum in bike frame construction?

Aluminum is a great material for bicycle construction. Aluminum is light, strong, economical, and relatively easy to make into various tubing shapes, wall thicknesses, or butting. Aluminum is also comparatively easy to weld. Unfortunately, the better grades of aluminum alloy require heat treating, which is somewhat of an art.

When we say aluminum is light weight, it's more accurate to say aluminum is low density. One cubic inch weighs one tenth of a pound. Contrast that to steel, where the same cubic inch weighs three times that amount. This means you can use twice the volume of metal that a good steel frame uses, and the steel frame will still weigh 50% more than an aluminum frame. And the lighter weight positively affects the ride quality.

Aluminum can be easily made into tubes which are shaped, butted, or tapered. It takes a little extra work, but tube shaping and butting can make more difference in the ride of the bike than the material itself. By shaping and butting the tubes just right, a good designer can make a bike that is stiff where it needs to be, yet comfortable. Used to its optimum, an aluminum bike will provide an outstanding ride.

Aluminum is also very strong. It is possible to achieve significantly higher strength properties in the aluminum structure per weight than in steel. Part of this comes from the basic material properties. You can use more material, and more easily form the material, so you can put just the amount and shape needed into the bike, and closely tailor the amount of material to the strength requirements at the specific area. Proper placement of the material within an extremely low weight structure is critical. To create a fatigue resistant aluminum bike frame, the structure requires fairly thick material in specific points. If you make the whole bike frame thick, it will be heavy and have a dead ride.

As with many other high-tech products, the largest contributor to a high strength bicycle frame is engineering and design. The low density and high formability of aluminum allows tubing with increased wall thickness, complex shapes and larger sections where we want to achieve high strength properties in the overall structure.

Aluminum is abundant around the planet, so the raw material is comparably inexpensive, especially compared to exotics like titanium or beryllium. Since aluminum is relatively easy to form, work, and weld, the final

structure of an aluminum bike can be quite inexpensive. However, some bike designers push so hard to produce a cheap aluminum frame that they don't really use the benefit's of aluminum. As we said before, the extra work we do often makes more difference than the material itself.

Are all aluminum alloys basically the same?

While all aluminum alloys are basically the same density, they do vary quite a bit in other mechanical properties. There is some variation in tensile strength, both yield (in layman's terms, bending strength) and ultimate (think breaking strength). There are variations in fatigue strength, ductility, and even manufacturing properties. As an example, some really strong aluminum alloys cannot be welded.

Some of the highest strength aluminum alloys, particularly in the 7000 series, have low elongation, or toughness, or resistance to crack propagation. This is important for overall strength and fatigue resistance. With alloys exhibiting higher toughness, less material is needed to resist fatigue, and this can result in a lighter bike. Like with any bike frame material, good design and manufacturing is much more important than a small difference in a single mechanical property.

To further confuse the issue, some alloys depend on heat treatment to attain their strength after welding. A good heat treatment can make a given alloy incredibly strong. An inferior heat treatment can leave the same alloy soft, weak, and prone to breaking. As an example, with our proprietary heat treatment, the 6061 aluminum in our Gold series alloy tests out to have a higher tensile strength than considered 'normal' for 6061 alloy.

In addition to our own heat treatment, we have also developed our own proprietary alloy, ZR9000. This alloy has greatly increased fatigue resistance, thanks to a special mix of elements within the alloy. As stated earlier, aluminum bike frames need to be correctly designed to limit fatigue and yet yield low frame weight and good ride quality. With ZR9000's extra fatigue strength, we can make lighter, better riding structures and at the same time actually increase the fatigue strength of the frame.

What do the numbers mean?

When we discuss aluminum alloys, we refer to a four-digit number. This is the alloy name, based on the alloying elements in the aluminum. A metallurgy reference would explain precisely what elements are added to the aluminum in a specific percentage (assuming the material is of high quality; like a bad chef, not everyone follows the recipe).

The second part of describing an aluminum alloy is the heat treatment or other strength enhancements which have been applied to the alloy. This is usually a letter and number following the alloy name, like 6061 T6. With some alloys, special heat treatments or work hardening are essential to achieve their maximum strength. Other aluminum alloys attain their maximum strength by simply cooling at room temperature, also known as 'normalizing'.

Since heat treatment adds extra steps to manufacturing, it adds cost, as does an oven large enough to handle bike frames. ZR9000 and 6061 aluminum require heat treatment. 7005 is usually normalized. Once again, heat treatment is a process that requires quality control. We use special ovens designed just for heat treating bicycles. Our proprietary design ensures that the heat treatment 'recipe' is exact and repeatable to a very high degree. The result is strong, lighter, better riding bikes. One ride will show you how well our bikes ride, our Limited Lifetime warranty tells you that we have total confidence in the manufacturing quality.

29 INCH WHEELS

Bicycle wheel size changes

Why are bicycle wheels the size they are? The first machine considered a true bicycle was called a Draisienne, after the German credited with inventing it. This embryonic bicycle allowed the rider to sit between two wheels, glide and steer. The propulsion was provided by pushing along the ground with one's feet. Limited by the length of a man's legs, the wheels were not overly large, and the rider sat near the ground. The Draisienne set speed records during its day, and was a highly efficient form of locomotion at the time.

For the purposes of this discussion, the next step in bicycle development was increasing its speed by attaching pedal cranks. The easiest method for attaching pedals was to put them directly on the front wheel axle, like modern tricycles. This put the pedals in front of the rider, for both comfort and ease of use. While pedaling increased the speed of the bike, it quickly became apparent that a larger drive wheel would make for further increases. As the front wheel grew, the rear wheel became smaller to reduce weight and maintain the handling characteristics of a shorter wheelbase. To maintain control over the bike, the rider had to sit near the steering axis, necessarily above the wheel. This new design was known as the penny-farthing, or Ordinary.

As the size of the drive wheel grew, bicycle speeds increased. Wheels got bigger and bigger. The riders on these bigger wheels got higher and higher off the ground (Fig. A1). Crashes became common. Remember, paved roads at that time were rare. Special handlebar designs were developed to make it easier to dismount as the rider flew over the front wheel.

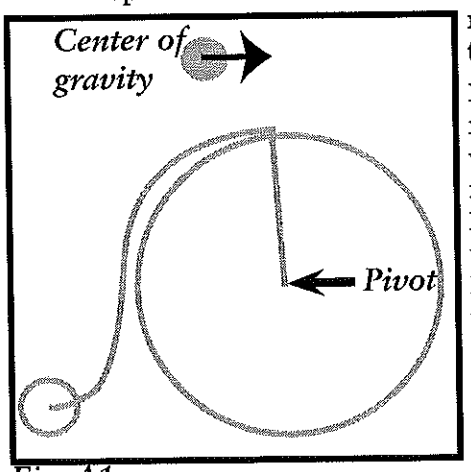

Fig. A1

Even with the many crashes, wheel size increased. The limit on wheel size was the rider's leg length. If the wheel was too big, the rider simply could not reach the pedals. Still, riders wanted more speed. Several solutions were put forth, and the one that succeeded was a chain-driven rear wheel. With the introduction of chain drive, bicycles acquired gears and gear ratios. By using cogs attached to the cranks and rear wheel, with different numbers of teeth, a single turn of the cranks could mean multiple turns of the rear wheel. This allowed a bicycle with smaller wheels to travel greater distances with a single revolution of the cranks. It also put the rider as close to the ground as pedal clearance would allow, and with two wheels of the same size. With the lowered center of gravity or these bikes, their riders weren't nearly as prone to pitching over the front wheel, and thus the new bikes became known as "Safety" bikes.

The wheels used on early Safety bikes were made of iron, steel or wood, which were then covered with a variety of materials. None of these cover materials was particularly shock absorptive, nor much help in achieving traction. However, they allowed a bike design to utilize whatever wheel size its creator desired. This was a time of experimentation, and wheel size varied a great deal. Some bikes had similar wheel diameters, others had different front and rear wheel diameters, and there was even disagreement on which end of the bike got the bigger wheel.

One of the next significant development in bicycle technology was pneumatic tires. This truly was a revolution, allowing bikes to float over small bumps, maintain traction, and all with a great deal more comfort. Soon after their introduction, pneumatic tires became a requirement for any performance bicycle. Tires, then, are what finally settled the debate of wheel size. Wheels were thereafter made in sizes to fit the tires available at the time.

A brief review of the literature did not reveal any specific reason why specific sizes were selected. Instead, its probably a function of tires being made to fit an existing wheel. And that wheel size was determined to fit within the existing bicycle design parameters as they occurred at the time.

Later, a similar choice was made at the birth of the modern mountain bike. When pioneers like Gary Fisher were building their clunkers for the famous descent of Mt.. Tam, the available tire size in a balloon tire was 26". Gary chose his rim size to fit the tires which he believed would work the best. As

tire companies began making tires specifically for mountain bikes, the new tires were made to fit the 26" rims. So the evolution of the mountain bike tire size was like that of wheel sizes; a selection made by what was available at the moment.

The limits to wheel size

The modern bicycle configuration places the rider's hands almost directly above the axle of the front wheel. Between these two points there resides the headset, or steering bearings, and the frame's head tube which holds those bearings. Attached above this is the stem. Below the steering bearings, the fork crown requires space, as does tire clearance for suspension fork travel. As wheel size increases, the room for the components decreases. If the wheel is too big, the immediate result is a handlebar that cannot be lowered to the desired position (Fig. A2).

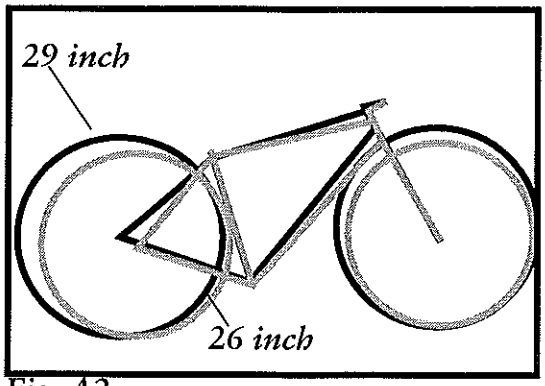

Fig. A2

An overly large front wheel can also create problems with the front-center dimension, the distance from the bottom bracket to the front axle. Front-center effects steering quickness, handling, and stability. The tire contact patch is directly under the front axle, regardless of the wheel size. A longer front-center adds stability, but slows the steering response of the bike somewhat. A short front center does the opposite, and if paired with a large wheel may allow toe-clip overlap, where the rider's foot contacts the front wheel during a sharp, slow speed turn.

The diameter of the rear wheel dictates the chainstay length, important because chainstay length is a factor in bottom bracket rigidity. Also, the location of the rear tire contact patch, relative to the rider's center of gravity, effects traction on steep terrain.

As a result of 'crowding', larger wheels only work on larger bikes. On a smaller bike, the head tube would have to be shortened so much that the frame would lose torsional rigidity. Even worse, the rider's hands would be lifted such that they could not achieve the proper position. The good news is that smaller people already had a low center of gravity to begin with; its just those bicycling skyscrapers who were too far above their front axles.

Large wheels provide a suspension effect

Imagine a skateboard wheel running over a series of 1" bumps. Since the skateboard wheel has a radius of only an inch, each time the wheel contacts a bump it has to move vertically 1 inch in just 1 inch of horizontal motion (Fig. A3). This is an abrupt change

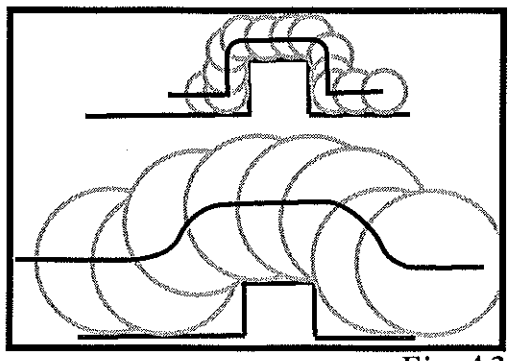
Fig. A3

with drastic effects on the rider's motion. With a 20" BMX wheel, that same 1 inch of vertical motion happens over about 4 inches of forward motion. This turns what was a radical bump into a mild annoyance. Now ride over our bump on a 26" wheel, and you have almost 6" of horizontal distance to spread out the impact, and the bump is hardly noticeable. With a larger wheel, not only does the bump disturb your riding less, but it also has less effect on your speed.

The suspension effect of a larger wheel is somewhat similar to that of a suspension fork, where your front wheel is moving up and down while your frame (and your body) take a smoother line, and with less loss of speed. Its also similar to the effect of running your tires at lower pressure, letting the tire casing flex to absorb the bumps. However, both a suspension fork and tire flex require you to tune the springs to get the effect. Wheel size is always at work. On the Fisher 29ers you'll notice the big wheel effect in two ways; The bike will ride smoother and more comfortably. And the bike will be slightly faster, especially on broken or rough ground.

Larger wheels provide stability

This last statement depends somewhat on the bike design. As an example, the high wheeler had a well-deserved reputation for being easy to pitch forward. The reason for this lies in the location of the rider's center of gravity relative to the pivot point when they pitch forward (Fig. A4). Pitching over the bars is not limited to downhills, but can occur any time the forces holding the rider

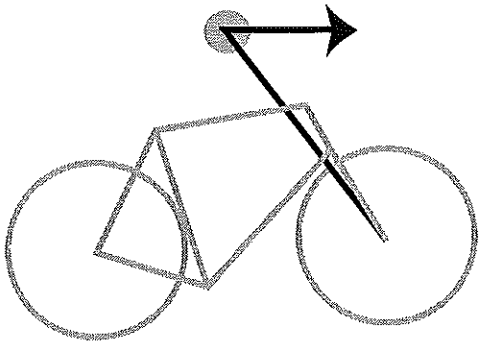

Fig. A4

behind the axle are less than the forces pushing them forward. So a sudden deceleration on the flats can make a rider pitch, much like flipping over the bars on a steep descent. Unless the front brake is locked up, the pivot point for the flip is the front axle.

In the case of the highwheeler, the rider sat quite high and well forward. Their center of mass was only just barely behind the front axle. With this position, it took little force to push them forward over the axle.

However, for this discussion we're talking about two modern mountain bikes that have only a slight change; a different wheel diameter. The bottom bracket is the same height from the ground on a 29er as on a bike with 26" wheels, so the rider's center of mass hasn't changed location. The only real difference is the larger front wheel has a higher pivot. It takes more force to push the rider forward over this higher pivot (Fig. A5). The larger front wheel makes the bike more stable as it runs over small obstacles that cause a deceleration of the bike, and this makes it easier to descend. On the Fisher 29ers you'll notice this effect mostly on steeper downhills. You won't have to slide back in the saddle as much to feel stable. This also means you can stay in the 'power position' for effective pedaling, so it even helps on the uphills!

Longer forks make a bike more stable

Trail is the distance from the tire contact patch to the center of the steering axis where it meets the ground. If the head angle and fork offset remain constant, a larger wheel diameter increases trail (Fig A5).

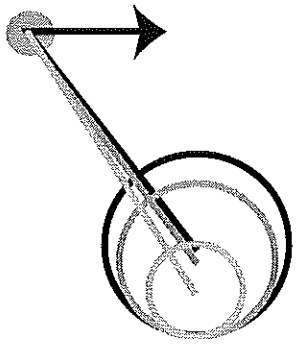

Fig. A5

Trail is what allows a bike to run in what we perceive as a 'straight' line. Its actually not straight at all, but instead a constant series of wiggles. These wiggles occur as the bike tries to maintain a state of equilibrium. Here's how it works. As a bike is tipped to the side, the front tire contact is moved to the side. You can try this; simply lean your bike to the side and watch what happens. The front wheel turns in the direction of the lean. With forward propulsion, the bike turns toward the lean and lifts the bike back into an upright state of equilibrium (not really balanced, but trying to balance).

The reason the bike steers into a lean is trail. As a bike is leaned, the contact patch is no longer in line with the steering axis, but to the side. This puts a torque about the steering axis, which turns the handlebars. The more trail there is, the further the contact patch is from the steering axis, and the stronger the steering effect as the bike is leaned. Consequently, the more trail there is, the more forceful the centering of the bike when its leaned, so the more stable it is.

On the Fisher 29ers you'll notice this effect mostly as a 'steady' feel as you head down the trail. The handlebars seem quiet, and as a result your hands and forearms can relax. Want to make the bike turn quickly? Just lean it over, engage some of the front tire's massive side knobs, and rail it through the turn!

Larger wheels are faster

For every 35% increase in wheel diameter, there is a 20% decrease in rolling resistance

on a soft surface (*Bicycling Science*, 1982). A 35% increase in tire width only decreases rolling resistance by 10%.

29 inch: The future

Like with any bicycle design, there are compromises. Larger wheels are not as stiff as smaller wheels. To maintain similar strength to their smaller counterparts, they are also somewhat heavier. Weight and rigidity are two ways to effect the overall efficiency of a bicycle. But they aren't the only two ways. Suspension, in the form of heavy, flexible suspension forks, has proven itself to be a compromise worth making. For many bigger riders, the smoother ride and increased stability of 29ers will also enhance their riding.

Throughout our development of this new wheel standard, we have made every effort to base our decisions on the best science. Gary himself did a long-running test where he compared his heart rate and times over the same course riding a 29er and his favorite 26" wheeled bike. He did this repeatedly, in a variety of conditions. Gary's best estimate is that the 29er was 3% faster for him. Whether you're comparing finish times, or you ride a little further on your Saturday ride, or you're less whipped after your next back country epic, we think 3% is a substantial difference

Identical fit

Although there are some differences in fit between a stock 29er and a 2002 Paragon, they are mostly due to our desire to provide the most possible adjustment. In other words, we use the same number of stem spacers on all these bikes. By simply moving headset spacers you can achieve a virtually identical fit.

The following chart shows how to match the sizes. It shows the frame model and size, the stem and spacer configuration (stock on the 26", modified for the 29er) and the exact relationship to the bottom bracket in millimeters in both vertical and horizontal measurements. You'll notice that most of the variances aren't much more than the thickness of a pair of cycling gloves.

Your results may vary, especially since suspension fork adjustment effects bike fit. These are calculated using 80mm travel forks with 10mm sag. Also note that the stems used on these two models do not match in rise, which effects the final fit.

The three asterisks (*) denote the non-stock adjustments.

Model	Size	Stem	Spacers	Vertical	Horizontal
Paragon	S	75/5	25	653	522
Supercaliber	S	60/7*	0*	650	524
Paragon	M	90/5	25	674	549
Supercaliber	M	90/7	10*	674	553
Paragon	L	105/10	25	708	564
Supercaliber	L	105/7	25	706	568
ParagonXL		105/10	25	722	564
Supercaliber	XL	105/7	25	715	569

Note: 5mm is about 1/8", so it is not likely to be felt by even the most sensitive rider.

6061 AND 7005 ALUMINUM ALLOYS

Is aluminum a new material?

It should be common knowledge that most modern aircraft use aluminum exclusively for their primary structures (internal frames and bulkheads) and 95% or better of their exterior surfaces, including load bearing skins. The aircraft industry has been using these alloys for several decades. The aircraft companies have picked aluminum because it offers the best combination of material properties and processing capability in order to create high performance, light weight, robust aircraft. So aluminum alloys have certainly proved their long term durability and high performance in the aircraft industry. The occasional failure that has occurred has typically been due to a design or manufacturing defect or improper maintenance.

What about fatigue?

Occasionally we hear fatigue failure erroneously described as similar to the result of bending a coat hanger back and forth. This example is not relevant to the durability or reliability of a bicycle frame. When you permanently deform the coat hanger you are yielding it. This has no relation to fatigue strength. Some of the highest fatigue strength materials (like carbon composite) will not take a significant permanent set, breaking instead at a high force level. So these extremely high fatigue strength fibers would rate near zero by the coat hanger test.

What are the benefits of aluminum in bike frame construction?

Aluminum is a great material to work with. It's light weight, or more accurately, low density. One cubic inch weighs one tenth of a pound. And the lighter weight positively affects the ride quality.

Aluminum provides a great ride, if you use it to its optimum. The low density and high formability of aluminum allows a designer to tailor the stiffness of each part of the frame through tubing and joint design. Tube shaping and butting can make more difference in the ride of the bike than the material itself.

Aluminum is very strong. It is possible to achieve significantly higher strength properties in the aluminum structure per weight than in steel. Part of this comes from the basic material properties. You can use more material, and more easily form the material, so you can put just the amount and shape needed into the bike.

But the largest contributor to high strength is engineering and design. The low density and high formability of aluminum allows tubing with increased wall thickness, complex shapes and larger sections where we want to achieve high strength properties in the overall structure.

Are all aluminum alloys basically the same?

Some of the highest strength aluminum alloys, particularly in the 7000 series, have low elongation, or toughness, or resistance to crack propagation. This is important for overall strength and fatigue resistance. With alloys exhibiting higher toughness less material is needed to resist fatigue, and this can result in a lighter bike. Like with any bike frame material, good design and manufacturing is much more important than a small difference in a single mechanical property.

Are all 6061 frames the same?

While the choice of an alloy is important, a more important factor is what you do with that material. Our Wisconsin built frames use the highest level of aluminum manufacturing technology in the industry. To start, all tubing is mitered with lasers so each tube is exactly the right length, each joint better fitting and stronger. Careful welding and full solution heat treatment is followed by precision alignment, so our frames ride straight and true. Without the costly attention to detail we apply to every frame, even the best geometry won't ride at its optimum.

What do the numbers mean?

When we discuss aluminum alloys, we refer to a four-digit number. This is the alloy name, based on the alloying materials in the aluminum. A metallurgy reference would explain precisely what elements are added to the aluminum in a specific percentage.

The second part of describing aluminum alloys is the heat treatment or other strength enhancements which have been applied to the alloy. With some alloys, special heat treatments or work hardening are essential to achieve their maximum strength. Other aluminum alloys attain their maximum strength by simply cooling at room temperature, also known as 'normalizing'.

Since heat treatment adds extra steps to

manufacturing, it adds cost. An oven large enough to handle bike frames also adds cost. 6061 aluminum requires heat treatment. 7005 is usually normalized.

Series nomenclature explained-

Silver Series- Proprietary Fisher aluminum tubing, using 7005 aluminum. These frames use special tubing diameters, wall thicknesses, and shapes, but are not butted. In some cases, Silver series frames are imported, then painted and assembled in Wisconsin.

Gold Series- Like the Silver series frames, Gold series is Fisher designed aluminum tubing. However, Gold series frames are built with 6061 T6 aluminum. T6 indicates the hardness of the aluminum, developed through a full heat treatment and ageing process. Gold series frames are all built and painted in Wisconsin. Due to the mechanical properties of 6061 T6 aluminum, Gold frames can be made lighter than Silver frames with the same strength.

Platinum Series- Platinum frames are also Fisher designed tubes of a combination of ZR9000 and 6061 T6. In addition, Platinum frames have butted tubing, which reduces their weight and further enhances their ride. The exact placement of these materials is determined by where each material will do the most good in achieving a light, strong, affordable, and long-lived bike. They are built and painted in Wisconsin.

SUGAR

Proven performance

When we introduced the Fisher Sugar in 2000, it set the suspension market on its ear. No bike before it offered the unique combination of Genesis handling and B*Link technology.

The Sugar has already proven itself to be a top level performer. Mary Grigson, on a Sugar, was one of the first riders to win a World Cup race on a full suspension bike. Clearly, the new Sugar is fast. With Genesis geometry, it's also an excellent handling machine. And it doesn't waste your energy. Everything a perfect full suspension bike should be, so even on a casual afternoon spin, your ride will be sweeter on a Sugar.

Genesis Geometry

The Sugar incorporates Fisher's Genesis Geometry. Gary's original concept was a bike with better stability in situations where the rider's center of gravity rolled them forward over the handlebars. As a by-product of his innovative solution, Gary also created a bike that better handles the higher speeds of Pro racers. A sneak peek with a tape measure into the pits at a NORBA National will reveal that many racers, on bikes with different brand names, are borrowing from Gary's geometry.

B*Link suspension design

The Sugar uses a special linkage to activate the rear shock, called the B*Link. The B*Link adds lateral rigidity to the frame, so compared to some flexy suspension designs the Sugar steers and handles like a hardtail.

Relative to Fishers of the past, the Sugar is considered short travel at 2.8 inches (75mm). However, the pivot location and resultant progressive suspension and compression ratio allows the Sugar to be plush on small stuff, yet not bottom on the big hits. The end result is an almost invisible suspension feel that some say mimics a hardtail. It takes the edge off, but you don't really notice the suspension movement. Combined with low weight, these features make the Sugar the ultimate all-round and racing suspension bike.

Less is more

While other suspension systems may offer some similar benefits to those of the Sugar, they have some things the B*Link design doesn't have. They have tiny little pivots crammed into the tight space by the rear dropouts. Those little pivots add weight to the bike, and at their attachment points the frame has to be designed with extra reinforcements that also add weight. As an added problem, if the pivots aren't perfectly aligned, they wear prematurely, so the extra alignment work adds cost to the bike.

Those dinky little pivots also have low torsional rigidity, allowing unwanted flex. As the suspension is activated on a bike with imperfect alignment and pivot flex, their little pivots will loosen up , which causes additional frame flex and squeaking.

Smart design

By carefully designing the pivot locations, swingarm, and links, Fisher engineers were able to create a suspension system that avoids those troublesome little pivots back by the dropouts. The key is finding the exact lengths and arcs to do this without undue stress on any frame members. Still, there is some flex of the frame as the suspension is activated. With each suspension stroke, there is a slight change in angle of the chainstays and seatstays.

Without careful design, this tiny flexing could cause fatigue of the frame resulting in breakage. Fisher engineers used some of our vast array of materials and manufacturing technology to avoid welding in the flexed area. Instead of welding, we use bonding technology to join the stays and rear drops. By using a space age epoxy adhesive, we achieve incredibly strong frame joints that don't have the inherent stress (and stress risers) of welding. This clever design avoids fatigue stress.

B*Link benefits

Our smart B*Link design completely avoids the annoying little rear dropout pivots with a light, rigid design. All you give up with B*Link is the tiny pivots and the headaches. B*Link stills gives you what you need in a full suspension design. The tires follow the terrain for maximum traction, pedal interrupting bumps virtually disappear, and big hits are swallowed up without bottoming the springs.

Designed for an air shock

For a cross-country design like the Sugar, we wanted the lightest shock possible. By

itself, just the spring of a coil/over shock can weigh more than an entire air shock.

Air shocks have progressive spring rates. For each increment an air shock is compressed, the rate of change of the spring rate goes up (gets stiffer).

However, air shocks can be too progressive, especially in high-leverage systems. In this scenario, in order to have a bit of sag in the system, the progressive nature of an air shock can prevent you from getting all the travel the bike has to offer.

The shock actuation of the Sugar is low leverage combined with a slightly falling rate. For each increment of swingarm travel, the actuation rate decreases (compresses less). This allows the Sugar to be set up with some sag, yet get full travel over big bumps. Basically, the Sugar design makes an air shock feel more linear, like you're getting extra travel.

More durable pivots

One last concern of our engineers was pivot durability and maintenance. Although you may not appreciate it on a test ride, pivot durability plays an important role after you've owned the bike for a while. As suspension pivots wear, they become loose. This looseness translates into frame flex, or "wag", which can allow the two wheels to track independently. You don't want this. In addition, worn pivots tend to squeak. Nothing is more annoying than listening to your bike squeak with every pedal stroke. So Fisher engineers borrowed from technology invented for use in heavy-duty earth-moving machines; Teflon impregnated composite bearings.

In the Sugar design, the bearings ride on very wide axles. The distance between the bearings, on a given axle, is what helps lateral stiffness in a bike frame. If an axle is only a few millimeters long (like those crammed in by the dropouts), then it offers little resistance to lateral and torsional flexing.

Even the ultimate suspension design makes for a lousy bike if it requires constant service. The Sugar uses a totally sealed, non-metallic pivot bearing. The amount of bearing contact is huge, and the bearings actually have a small amount of shock absorption capacity. This combination of features means you can ride a Sugar for thousands and thousands of miles without any maintenance, and without any noise or rear end wag.

Industrial strength

The original development of the Sugar pivot technology was for use in industrial quarrying, where huge machines work under monstrous loads in a dirty environment. Gosh, almost sounds like mountain biking!

Constant improvement

We continually strive to improve our bikes. In 2002, we completely revamped the sugar frame, tubing, and link. Here we recap those changes.

New frame tubes = lighter weight and lateral rigidity. The new Sugar uses our new frame material, ZR9000. The key to this new material is that while the frame is now 15% stronger, it is at the same time 15% lighter, and still up to 5 times more fatigue resistant.

The new Sugar has a downtube with a much greater diameter. This makes the frame laterally and torsionally stiffer. Combined with other new frame features, the new Sugar is over 7% stiffer!

We also have taken advantage of our carbon fiber technology, with both carbon chainstays and carbon seatstays. We ended up with a frame that's 1/4 pound (over 100 grams) lighter!

Redesigned B*Link = lateral rigidity. The new B*Link is stiffer laterally than earlier versions. However, to achieve this improvement, it was necessary to redesign its attachment points. This means the new B*Link cannot be retro-fitted to 2001 or previous Sugars. Likewise, it cannot be interchanged with the Sybil link on the Sugar+.

New swingarm without 'seatstay bridge' = tire clearance. By using very large diameter 'seatstays', we were able to remove the brake bridge. Normally the bridge is needed to stiffen the area around the brake bosses. With the super-large diameter tubes we designed, we were able to remove the bridge completely while maintaining adequate brake rigidity. The result is tons of tire clearance, now fitting even up to a 2.35 tire.

Sugar suspension setup

Fox shocks have two springs, a 'positive' and a 'negative'. The positive spring works to make the shock longer, while the negative

spring works to make the shock shorter. The negative spring works only during the first part of the shock stroke, in effect helping small bumps to compress the shock. This makes the Sugar feel plush. After a small amount of shock compression, the negative spring ceases to have an effect, and just the positive spring resists large bumps.

With a Fox rear shock, pump up the pressure to around 25-35 PSI less than your body weight in LBS (see chart below). With models that provide damping adjustment, try 2-3 turns in from fully fast. This is a good place to start. You should experiment in small increments to find what works best for your position, terrain, body weight, and riding speed.

Body Weight	/Preload	Body Weight	/Preload
LBS	PSI	KG	ATM
100	75	45	5.43
110	85	50	6.04
120	95	55	6.64
130	105	60	7.24
140	110	65	7.85
150	120	70	8.45
160	130	75	9.05
170	140	80	9.66
180	150	85	10.26
190	155	90	10.86
200	165	95	11.47
210	175	100	12.07
220	185	105	12.67
230	195	110	13.28
240	205		

SUGAR+ (INCLUDING SUGAR 29)

Evolution

The Sugar+ borrows heavily from the hugely successful Sugar design, but expands on that success to create a more versatile bike. By providing a way to adjust the suspension travel, the Sugar+ can exactly mimic the design of the Sugar, or go into long travel, adventure mode. And this magic act takes only about a minute. The Sugar is lighter, but one should expect that from a more expensive bike.

Adjustable Travel

The Sugar+ allows you to choose from two configurations. In short travel mode, the Sugar+ has the exact same geometry and travel as the Sugar (2.8" / 70mm). By moving the rear shock into its long-travel position, you increase the rear wheel travel to 4.1 inches (100mm). Then dial the fork to its 100mm travel position (some forks may offer even more travel). The only change in handling comes from a resultant 14mm increase in bottom bracket height. The sweet ride of Genesis geometry is still there. Even cooler, you don't have to change the pressure in the rear shock, just the position!

Genesis Geometry

The Sugar incorporates Fisher's Genesis Geometry. Gary's original concept was a bike with better stability in situations where the rider's center of gravity rolled them forward over the handlebars. As a by-product of his innovative solution, Gary also created a bike that better handles the higher speeds of Pro racers. A sneak peek with a tape measure into the pits at a NORBA National will reveal that many racers, on bikes with different brand names, are borrowing from Gary's geometry.

Sybil link suspension design

The Sugar+ uses a special linkage to activate the rear shock, called the Sybil link. The name "Sybil" was a taken from a famous psychology case which profiled multiple personalities. The name Sybil can also be found in mythology, a seer who could predict the future. Either way, it's a good description of the capabilities of the Sugar+.

The Sybil link adds lateral rigidity to the frame. The box construction with parallel through-axles at either end means that the link resists torsion applied by the terrain pressing against the rear wheel. What all this means is that the Sugar+ keeps the rear wheel in line over rough terrain, so your Sugar+ handles like a hardtail, but with the extra cush you want in a long-travel suspension bike.

The pivot location and resultant progressive suspension and compression ratio allows the Sugar+ to be plush on small stuff, yet not bottom on the big hits. The end result is an almost invisible suspension feel; it takes the edge off, but you don't really notice the suspension movement.

Less is more

While other suspension systems may offer some similar benefits to those of the Sugar+, they have some things the Sugar+ design doesn't have. They have tiny little pivots crammed into the tight space by the rear dropouts. Those little pivots add weight to the bike, and at their attachment points the frame has to be designed with extra reinforcements that also add weight. As an added problem, if the pivots aren't perfectly aligned, they wear prematurely, so the extra alignment work adds cost to the bike.

Those dinky little pivots also have low torsional rigidity, allowing unwanted flex. As the suspension is activated on a bike with imperfect alignment and pivot flex, their little pivots will loosen up , which causes additional frame flex and squeaking.

Smart design

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Without careful design, this tiny flexing could cause fatigue of the frame resulting in breakage. Fisher engineers used some of our vast array of materials and manufacturing technology to avoid welding in the flexed area. Instead of welding, we use bonding technology to join the stays and rear drops. By using a space age epoxy adhesive, we achieve incredibly strong frame joints that

don't have the inherent stress (and stress risers) of welding. This clever design avoids fatigue stress.

More durable pivots

One last concern of our engineers was pivot durability and maintenance. Although you may not appreciate it on a test ride, pivot durability plays an important role after you've owned the bike for a while. As suspension pivots wear, they become loose. This looseness translates into frame flex, or "wag", which can allow the two wheels to track independently. You don't want this. In addition, worn pivots tend to squeak. Nothing is more annoying than listening to your bike squeak with every pedal stroke. So Fisher engineers borrowed technology from the thousands of proven Fisher full suspension bikes on the trail; Teflon impregnated composite bearings.

In the Sugar+ design, the bearings ride on very wide axles. The distance between the bearings, on a given axle, is what helps lateral stiffness in a bike frame. If an axle is only a few millimeters long (like those crammed in by the dropouts), then it offers little resistance to lateral and torsional flexing. That's why the Sugar doesn't use this type of pivot at the dropouts.

Would you rather work on your bike than ride it? Even the ultimate suspension design makes for a lousy bike if it requires constant service. That's why the Sugar+ uses a totally sealed, non-metallic pivot bearing. Think about this; which wears faster, a suspension fork (with non-metallic bushings) or a headset (with ball bearings)? If you answered "headset", you're correct.

When you hit a bump with the rear wheel, the force is transmitted through the pivot (before it gets to the shock). With ball bearings in a pivot, the contact area of the bearings is extremely small, and metal to metal. It's inevitable that this contact point is going to wear fast. With the Sugar, the contact point is huge, and the bearings actually have a small amount of shock absorption capacity. This combination of features means you can ride a Sugar for thousands and thousands of miles without any maintenance, and without any noise or rear end wag.

Industrial strength

The original development of the Sugar pivot technology was for use in industrial quarrying, where huge machines work under monstrous loads in a dirty environment. Gosh, almost sounds like mountain biking!

Bearing force threshold

If you take all the parts off a suspension bike and remove the rear shock, you'll find several things. First, it becomes much easier to see what the suspension does when the rider hits a bump.

Second, you will see that there are differences in the amount of force it takes to initiate suspension movement. Brands with ball bearings in their pivots point out that the Sugar, especially when brand new, takes some force to move. Generally, it take somewhere around 10 pounds of force at the rear axle to move a brand-new Sugar swingarm.

Is this force threshold interfering with the bike's performance?. As you ride your Sugar, the composite bearing deposits material onto the nickel-less anodized pivot axle. After break-in, the bearing surface becomes in effect Teflon against Teflon. Since the composite is much slipperier than the aluminum, the force required to activate the pivot becomes much less after break-in.

The other thing to consider is this- once you exceed the activation threshold, the 'stiction' of the bearing no longer effects the travel. You can feel this on the workstand. When you sit on the bike, you have applied way more force than ten pounds to the rear axle. The spring stores the energy from you compressing it, so when you get off, about the same force works to return the shock to its un-sagged length. So this 'test' of the bearing stiction has little to do with how the bike actually works.

Basically, we feel the huge bearing surface of our design, coupled with its low weight and totally sealed nature, make our pivot far superior to a ball bearing pivot.

Frame features

At a quick glance, the Sugar+ may look the same as our first Sugar, it actually has many improvements.

New frame tubes = more lateral rigidity at the same weight. The Sugar+ uses our new frame material, ZR9000. The key to this new material is that while the frame is now 15% stronger, it is at the same time 15% lighter, and way more fatigue resistant.

Sybil link = adjustability and lateral rigidity. This means the new Sybil link cannot be retro-fitted to Sugars, neither 2002 or earlier.

New swingarm without 'seatstay bridge' = tire clearance. By using very large diameter 'seatstays', we were able to remove the brake bridge. Normally the bridge is needed to stiffen the area around the brake bosses. With the super-large diameter tubes we designed, we were able to remove the bridge completely while maintaining adequate brake rigidity. The result is tons of tire clearance, now fitting even up to a 2.35 tire (carbon fiber version from Sugar shown).

Genesisters model. The Sugar 3+ is now offered in Genesisters geometry, Gary's Genesis concept executed to fit women.

Other details. The Sugar+ frame accepts V-type or International mount disc brakes.

Sugar+ suspension setup

With a Fox rear shock, in the short travel mode, pump up the pressure to around 25-35 PSI less than your body weight in LBS (see chart below). With models that provide damping adjustment, try 2-3 turns in from fully fast. This is a good place to start. You should experiment in small increments to find what works best for your position, terrain, body weight, and riding speed.

One of the cool features of the Sugar+ concept is that once you've adjusted the rear shock for its 'standard' travel mode, you don't have to change the preload. When you move to the long travel position on the Sybil link, the change in actuation ratio means the long travel adjustment will be appropriately softer.

For the long travel mode, set up the shock in the short travel mode as explained above. Then, simply move the shock to its long travel position on the Sybil link. For most riding, no further adjustments are necessary.

Body Weight / Preload		Body Weight / Preload	
LBS	PSI	KG	ATM
100	75	45	5.43
110	85	50	6.04
120	95	55	6.64
130	105	60	7.24
140	110	65	7.85
150	120	70	8.45
160	130	75	9.05
170	140	80	9.66
180	150	85	10.26
190	155	90	10.86
200	165	95	11.47
210	175	100	12.07
220	185	105	12.67
230	195	110	13.28
240	205		

BONTRAGER WHEELWORKS

Not just a collection of specs

Bontrager Wheelworks wheels set a new standard in wheel performance. Bontrager Wheelworks wheels are light, fast, and rock solid, with a unique set of application-specific features.

Since different types of riding place different demands on wheels, Bontrager Wheelworks applies the features to each wheelset which will optimize its performance for that use. In other words, each wheelset draws on the best specific set of the following possible features: paired spoking, OSB (Offset Spoke Bed), front-or-rear specific rims, disc-specific rims, top quality spokes (aero in some applications), and special hub designs.

Engineered wheels

Bontrager Wheelworks wheels are highly engineered; every aspect of wheel performance has been considered, and redesigned when necessary. An extensive battery of tests has proven these to be truly outstanding products in aerodynamics, low moment of inertia, and durability. Since we proudly list the weights, it's easy to see the Bontrager advantage in this parameter. But with Keith Bontrager, durability is always a characteristic of paramount importance. These wheels are no exception. The battery of tests which every Bontrager wheel design must pass is truly astonishing.

As an example, one torture test involves placing a load on a wheel simulating a 300 pound rider on their bike, and rolling the wheel over fixed cleats at 30 MPH. Don't try this at home! While all Bontrager Wheelworks wheel designs must pass this test, it regularly destroys many of the wheels of our competitors.

The key to durable wheels

The most important aspect of wheel building is achieving even spoke tension, within a range of acceptable tension. Certainly some of the responsibility here lies on the careful hand-finishing applied to all Bontrager Wheelworks wheels. But even the best trained hands won't achieve consistent, even spoke tension if the wheel isn't designed properly.

Design review

When engineering wheels, every aspect of the wheel and its components must be considered as a group. Rim design effects lateral and radial stiffness, spoke bed strength, and in extreme cases impact resistance. Spokes must be selected with the right strength and elasticity. Hub design must provide support for the spoke head, and flange width effects lateral stability. All the features must match up exactly to optimize the design's strength-to-weight ratio. The wheel is only as strong as its weakest link.

The missing factor

On any bike, the rear wheel sees more stress than the front wheel. The rear wheel supports a greater percentage of the rider's weight. It must accommodate the freewheel or cassette, yet center the rim over the axle ends. It is trapped between the rigid chainstays, while some of the force that might otherwise load the front wheel is absorbed by the natural flex of the fork and its ability to pivot about the steering axis. Comparing the forces that occur in riding between the front and rear wheels, the rear wheel can see greatly increased radial and side loading.

Over the years, many approaches have been taken to increase rear wheel strength. Rather than attempt to review all those here, we'll simply present the goal of the Bontrager rear wheel; create the best possible balance of spoke tension from the drive side to the non-drive side of the rear wheel. Bontrager engineers closely studied the effects of various bracing angles and carefully maximized the distribution of the pulling load over more spokes to reduce variation in spoke tension. As we have said before, the greatest source of wheel failure is uneven spoke tensions. Since the inherent design of a multi-speed rear wheel creates a large difference in tension between left and right sides of the wheel, the best way to create a durable structure is to minimize this difference. If a spoke is at lower tension than its neighbors and the rim is further loaded, the spoke is in danger of reaching zero tension.

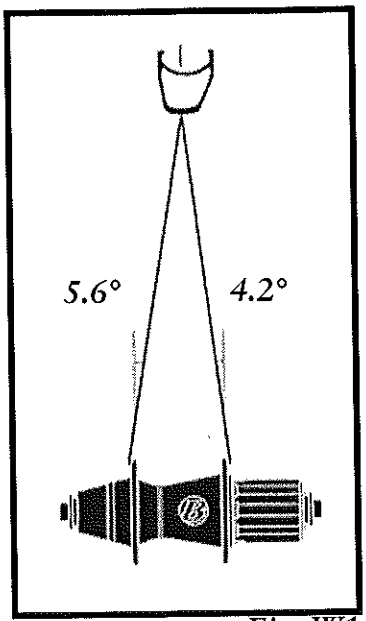

Fig. W1

At zero tension, a spoke can't effectively support the rim.

Bontrager Wheelworks rear wheels employ OSB (Offset Spoke Bed) rims and special hub designs with a more inboard left flange spacing. These features provide more equal bracing angles (Fig. W1). Compared to a 'standard' wheel, OSB reduces spoke tension difference by 30%.

Wheel strength and torque transfer

With a 'standard' rear wheel, the left side spokes are at lower tension than the right side spokes. At low tension, spokes cannot apply force to the rim. In a Bontrager rear wheel, the higher left side tension allows the left spokes to transfer torque between the hub and rim. However, it takes more than just spoke tension to effectively transfer torque. Bontrager wheels also use specially-designed hubs (Fig. W2).

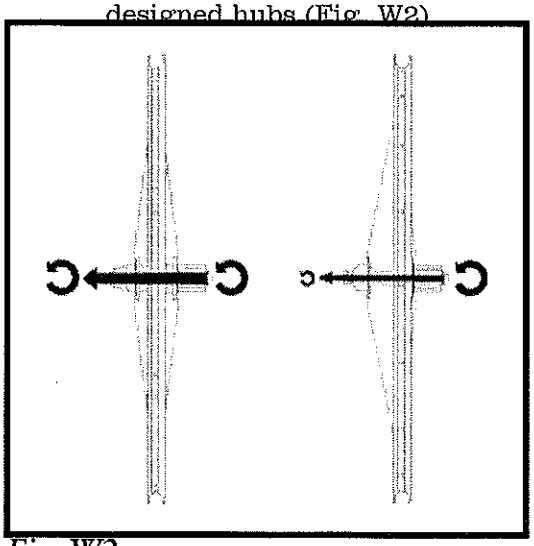

Fig. W2

The more highly tensioned left spokes in a Bontrager rear wheel also provide increased strength through increased radial and lateral load capacity. In other words, Bontrager Wheelworks wheels are stronger and more efficient.

Bontrager wheels create a structure with more even tension, and thereby reduce the overall stress on the individual components. The result is that Bontrager Wheelworks wheels offer unmatched strength and durability.

Bontrager wheels stay true longer

As your bike rolls down the road, the wheels are loaded with your body weight. The road resists the force of your body weight, slightly deflecting the rim at the point of road contact. As the wheels turn, the point of contact moves. This moving force creates a change in spoke tension such that every spoke on the wheel is seeing a loose-tight-loose-tight-loose-tight cycle.

The greater the difference in spoke tension within the wheel, the greater the chance that the loosest spoke will become slack and the rim will be allowed to deviate (Fig. W3). Bontrager wheels have more balanced

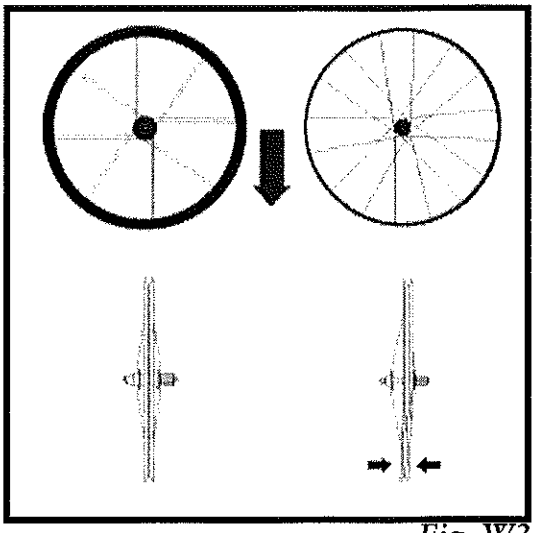

Fig. W3

spoke tension, or even PST (Paired Spoke Technology) to combat this effect.

If a spoke becomes slack, additional fatigue is shifted onto other components in the wheel. This cycle creates fatigue in the spokes, which will eventually fail. In the same way, fatigue can even cause a rim to fail.

Long before fatigue causes parts to fail, the wheel may come out of true. As the tension is removed from a spoke, the nipple can more easily turn on its threads. This results in the wheel coming out of true. With Bontrager Wheelworks wheels, the design creates more even tensioning. Maintenance is therefore at a minimum.

The keys to a perfect road wheel

All wheels benefit from low weight, durability, and low maintenance. Bontrager Wheelworks road wheels employ a specific set of features to achieve their high level of performance.

Due to the higher average speeds seen on pavement, the aerodynamics properties of a road wheel are very important. One of the major influences on wheel aerody-

namics is spokes. Many Bontrager road wheels use aero, or bladed, spokes to reduce wind drag. These wheels also use reduced spoke counts, relying on PST (Paired Spoke Technology) to maintain high wheel strength with fewer spokes (Fig. W4).

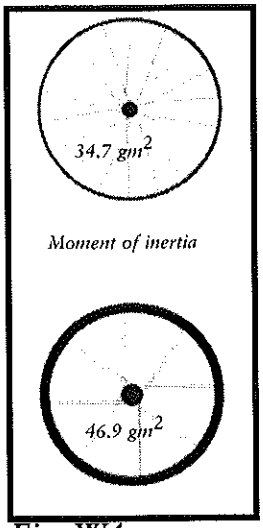

Fig. W4

Front and rear road wheels have different needs. On a bike, the front wheel sees the most wind resistance because it is the leading edge of the bike. The rear wheel is "drafting the seat tube", and is in much more turbulent air. For this reason, some models of Bontrager road front wheels use a deeper, more aerodynamic rim than the rear wheel.

Mountain bikes have different needs

Compared to road wheels, mountain bike wheels place a greater need on wheel durability and rigidity. Aerodynamics are less important. Acceleration becomes very important, effecting your ability to change speeds, attack short climbs, or negotiate other obstacles in the trail. A Bontrager mountain bike wheel uses alternating spokes and a lighter rim to create a wheel with lower moment of inertia (Fig. W4) to make acceleration easier.

Mountain bike wheels sometimes require special configurations, like the ability to accept a disc brake rotor. Again, Bontrager Wheelworks mountain bike wheels select those features which will best create the ultimate structure.

With disc-specific wheels, the rim does not need a flat sidewall. Removing this design constraint allows optimization of the rim shape to reduce weight. Placing a rotor on the front wheel creates an asymmetric spoke configuration that can be enhanced using a rim with OSB (Offset Spoke Bed), thereby reducing the required dishing and providing more balanced spoke tension from left to right side of the wheel. Also, Bontrager disc wheels use crossed spokes to efficiently transfer disc brake forces between the hub and rim with less stress on the wheel.

With rim brakes, Bontrager Wheelworks incorporate tall sidewalls so that brake adjustment is easier, and pad wear has less effect on proper adjustment; taller sidewalls provide increased surface for the brake pad to mate to.

Bontrager rear mountain wheels focus on balancing spoke tensions on the drive and non-drive side of the wheel. To do this, they employ OSB (Offset Spoke Bed) rims and special hub designs with modified flange spacing. These features greatly reduce the tension differentials from side to side, creating a stronger, more durable structure. The higher left side tensions allow more torque transfer to the left side drive spokes. In other words, Bontrager Wheelworks mountain wheels are stronger.

Truing Bontrager Wheelworks wheels

Most Bontrager wheels employ standard, externally adjustable spoke nipples. The only exceptions are the Bontrager Race X Lite Carbon Road wheels, and the Bontrager Race X Lite Aero road wheels where a small aerodynamic benefit can make the difference between winning and losing a race.

Bontrager Road wheels use PST (Paired Spoke Technology) which require a slightly different technique to true. In many respects, truing Bontrager Wheelworks wheels with PST 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 Bontrager wheel with PST, 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 effects the tension, and thus the spatial position, of the two partners. This in turn effects the next outward pair, and so on.

When truing Bontrager Wheelworks road wheels, PST sometimes 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.

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 Villum, a highly sensitive truing stand that uses dial indicators driven by precision-bearing sensors rolling on the rim edges. When 0.5mm passes by the indicators on the Villum, the needles move about an inch. What looks like a mountain on the Villum 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, it's very visible to the naked eye.

With Bontrager Wheelworks, 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.

The "little marks" on the rims

On some 2002 and later Bontrager rims and wheels there are small spherical indentations in the braking surface of the rim. This isn't a blemish, it's a wear indicator. If the braking surface has worn so that the indicator is no longer visible, have your dealer replace the rim.

Technical Specifications

For detailed technical specifications, wheel building instructions, spoke lengths, tensions, and hub maintenance information, please refer to the Bontrager Wheel Service Manual (found on Dexter), or cybersurf to *www.bontrager.com.*

TUBELESS COMPATIBLE TECHNOLOGY

Snakebite

You are probably familiar with this scenario. With your tire pressure set on the soft side to enhance traction, you run over a sharp object, like a rock. The soft tire is compressed between the rock and the rim, another hard spot. Caught in the middle of this squeeze play is the tire and the lowly inner tube, made of soft rubber. The tire can resist the compression because it is fairly thick, and has reinforcing threads running through it. The poor inner tube has nothing. Under pressure, the inner tube rubber separates and gets treated to the mountain bikers' nemesis: snakebite, denoted by a pair of matched holes in the inner tube.

A cure for snakebite

Until recently, the only cure for snakebite was to increase the air pressure in the tire. Unfortunately, this solution causes its own problem; reduced traction. To solve this problem, a consortium of rim and tire builders came up with a novel approach; why not eliminate the tube? Following this path they came up with a design using a dedicated tire to seal to a dedicated rim and hold air without a tube, dubbed UST.

The downside of UST

The UST 'solution' has a host of its own problems. First, its very expensive. The key to UST is a rim without spoke holes through its outer wall. This design requires a special method of rim manufacturing and spoke installation. Second, this special wheel doesn't use conventional spokes, so to get UST benefits the rider has to buy an entire wheel. Third, a UST rim will not work with a standard tire. And lastly, there is a limited selection of tires and tread patterns that will fit this special rim.

A second opinion

We considered the pros and cons of UST tubeless technology and saw that there was room for improvement. By finding a different method of containing the air, we are able to use conventional wheel building practices. Not only does this make it less expensive to buy into the system, it also means the wheels are fully serviceable at your local dealer; a real plus for the rider. Second, our rim design is compatible with standard mountain bike tires, given that the rider use an inner tube. With both UST and our Tubeless Compatible system, going tubeless requires a special tire that has a sealing layer on the inside of its casing to prevent the air from simply rushing out. Conventional tires don't have this layer. But again, you can use a conventional tire on our tubeless compatible rims, you just have to use a tube. In addition, with our system you can use the UST tubeless tires.

How did we do it?

The key to our Tubeless Compatible system is a special rim and its mated rim strip. This rim strip is made of a thermoplastic rubber material, so its impervious to air. Installed correctly in the special mated rim, it seals tightly to prevent air escaping through the spoke holes. The rim's hook allows greater contact with the tubeless tire's smooth, enlarged bead so these two surfaces also seal up tight. The inside of the tubeless tire has a special coating to prevent air from escaping through the tire casing. When these features are all in order, no tube is needed. Just install a special presta valve stem into the rim, and inflate.

Does the system eliminate air leakage?

Have you ever noticed that you occasionally have to pump up your tires (well, really its your tubes), even if they don't have a puncture? In a similar fashion, a properly mounted tubeless tire can 'bleed' air. We expect that this will amount to about 4 PSI (1/4 ATM) per day.

For display purposes, 2003 complete bikes with tubeless tires include an installed inner tube. Since inner tubes have a slower bleed rate, the dealer won't have lots of bikes sitting on the sales floor with soft tires.

What if a tubeless tire runs over a nail?

A tubeless tire functions like a tire with a tube in it. Its just that the tire holds the air, not the tube. So if you run over a large, sharp object that can penetrate the tire casing, it will probably flat the tire just like with an inner tube.

Also like an inner tube, you can probably patch the hole (from the inside of the tire). The difficulty lies in determining where a tire is punctured. An inner tube is basically fully enclosed. A tubeless tire is not. If the source of the air leak is not immediately obvious, you may have a problem getting the

tire inflated enough to locate the puncture. However, if you puncture out on the trail its an easy matter to simply remove the special tubeless valve stem and install a tube.

Anything considered a down side?

To inflate a tubeless tire, it must be in contact with the rim, tight enough to make full contact with the rim when at the bottom of the rim well. So the tires have to fit on the rim a little tighter than does a conventional tire. This makes a tubeless tire somewhat harder to install. The good side of this is that it does not take a compressor to initially seat the tire beads. A good hand pump will do. Or an air cartridge.

With a tire that fits this snug, you might not be able to install it barehanded. If you choose to use tire levers for installation or removal, its important that you do not damage the rim or abrade the tire bead. If either surface is damaged, the roughened surface will likely allow a greater rate of air bleed from the mounted tire.

BONTRAGER COMPONENTS

Introduction

There is a quote attributed to Keith Bontrager that says, "Strong, light, cheap- pick two." This, in a nutshell, is the challenge faced by the Bontrager engineers in creating great components for bicycles. To build high strength parts, you can use lots of material, which adds weight. Alternately, you can use expensive, high-strength material, which adds cost.

Bontrager components make the best of this difficult situation with clever design. Through extensive testing, a thorough understanding of the stresses a rider puts on their bike, and in-depth research in material science, Bontrager components offer you a real value at a variety of performance levels.

Handlebars

Crowbar Race (Fig. BC1)

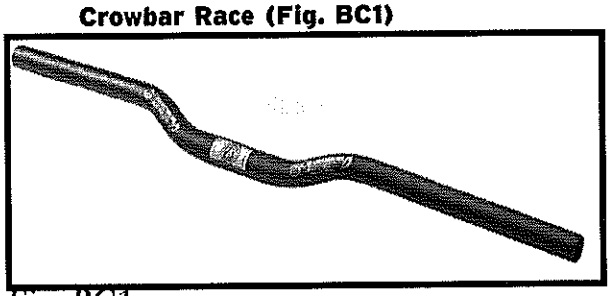

Fig. BC1

A lightweight riser bar for cross country riding, fabricated from 2014-T6 custom butted aluminum.

- 630mm wide
- 25 and 40mm rises
- 9 or 13° bends
- 275 to 280gm
- Black anodized

Crowbar Sport

A lightweight riser bar for cross country riding, fabricated from 6061-T6 aluminum.

- 620mm wide
- 25mm rise
- 5° bends
- 300 to 320gm
- Black anodized

Race Lite ATB

Fabricated from 7075-T6 custom butted aluminum, this bar has a shot peened surface finish for increased fatigue life. It has been exhaustively tested in the field and in the lab, and is built to last.

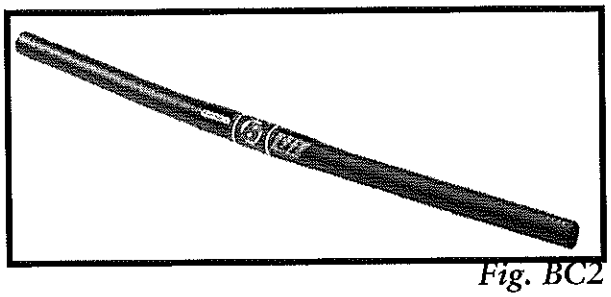

Fig. BC2

- 600mm width
- 7° bend
- 149gm
- Black anodized

Race ATB

Fabricated from 2014-T6 custom butted aluminum, this bar has a shot peened surface finish for increased fatigue life. It has been exhaustively tested in the field and in the lab, and is built to last.

- 600mm width
- 7° bend
- 185gm
- Black anodized

Select ATB

Fabricated from 6061-T6 custom butted aluminum, this bar is bent for comfortable hand positioning. It has a shot peened surface finish for increased fatigue life.

- 7 degree bend
- 600mm wide
- 199gm
- Black anodized

Road Race CX

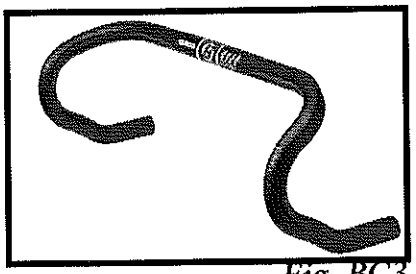

Fig. BC3

Custom bend specifically for cyclo-cross, with an extra long flat section on the drops for extra comfort. Fabricated from 7075-T6 custom butted aluminum, then shot peened for a 30% increase in fatigue strength.

- 25.4mm clamp (use with any ATB stem)
- 400, 420, 440, 460mm wide, C-to-C
- 90mm reach, 148mm drop
- 235-270gm width
- Black anodized

Stems

Race Lite ATB (Fig. BC4)

Forged and TIG welded from 6061-T6 aluminum, this stem has a steerer clamp that is knee friendly, with the two bolts rotated around the side. It is shot peened for extra fatigue strength. The unique faceplate design is yet another example of our attention to the details.

Fig. BC4

- 1 1/8" steer clamp size
- 40mm stack height
- 60, 75, 90, 105, 120, 135mm extensions
- +/-7 and +/-17° rise
- 160-180gms
- Black anodized

Race ATB (Fig. BC5)

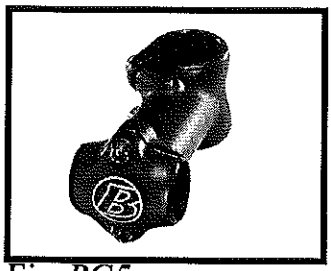

Fig. BC5

This stem is 3-D forged from 6061-T6 aluminum and has better fatigue characteristics than any threadless stem we've tested. The handlebar clamp is a dual bolt design to make stem changes simple.

- 1 1/8" steer clamp size
- 40mm stack height
- 60, 70, 80, 90. 100, 110, 120, 130mm extensions
- 10 and 25° rises
- 165-185gms
- Black anodized

Select

This stem is 3D forged for low weight and smooth lines. It is shot-peened to increase fatigue strength.

- 1 1/8" steer clamp size
- 40mm stack height
- 60, 70, 80, 90. 100, 110, 120, 130mm extensions
- +/-5, +/-10 and +/-25° rise
- 160-190gms
- Black anodized

Sport

This stem is offered in slightly more upright configurations.

- 1 1/8" steer clamp size
- 41mm stack height
- 60, 70, 80, 90. 100, 110, 120, 130mm extensions
- +/-15 and +/-25° rise
- Black anodized

Fig. BC6

Seatposts

Race (Fig. BC5)

This exceptional post is constructed with a straight gauge 2014-T6 aluminum quill. The two bolt clamp design is extremely strong and safe, and has a wide range of adjustability.

- 25mm offset
- 250, 330, and 390mm lengths
- 27.2, 31.6mm diameters
- 225-305gms
- Silver or black anodized

Sport

Even our basic post is constructed with a straight gauge 2014-T6 aluminum quill. The two-bolt, rocker-clamp design makes tilt adjustments precise and simple, with a wide range of adjustments.

- No offset
- 250, 300, and 390mm lengths
- 26.8, 27.0, 27.2, 31.6mm diameters
- 215-285gms
- Silver or black anodized

Cranksets

Race Lite ATB (Fig. BC7)

Our best crankset has cold-forged 7050-TV aluminum arms and a rigid, oversized 7075-T6 'Five mm Drive' aluminum 44T large chainring. The revised chainring design provides greater shifting performance and chain management. This Race Lite crank uses a super strong and stiff ISIS Drive splined bottom bracket.

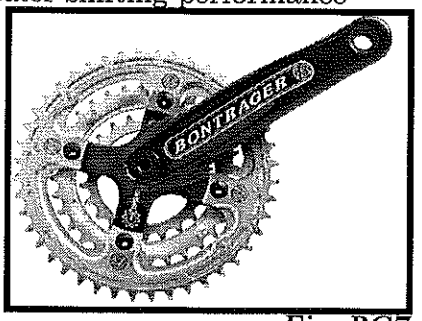

Fig. BC7

- Tech-Nickel plating on rings
- Vibra-seal on chainring bolts
- 170 and 175mm lengths
- 44x32x22 9-speed chainrings
- 685gms w/bolts
- Blast black arms and Tech-Nickel spider

THE GREG LEMOND STORY

Greg's List

Greg LeMond is a visionary. In 1978 as a young high school student, Greg listed on a piece of paper his 4 goals in cycling, with dates:

1. 1979- Win Junior World Championship Road Race

2. 1980- Win Olympic Road Race

3. By age 22- Win Professional World Championship Road Race

4. By age 25- Win Tour de France

Greg changes American cycling

In 1978, a prediction like this seemed brash. The idea that an American could win an international race was almost laughable. Today, an exceptional set of goals like Greg's has become completely believable. This complete change in our perception illustrates just how much Greg changed cycling in the U.S., if not the world.

As a developing cyclist, Greg identified the equipment which would give him an edge. He had an uncanny knack for equipment selection, always the first to spot a particular item which might give him an advantage. In any race, seconds count. Consider that Greg won the 1989 Tour de France by just 8 seconds, the closest margin in Tour history.

Most of the items that Greg pioneered are considered standard equipment these days. Greg was among the first in the European peloton to use clipless pedals, a heart monitor, special cycling eye wear, a cycle computer, thin-shell helmet, or a titanium frame. Of course, our pick for a competitive edge is a bike built with LeMond geometry, which we detail later. For now, back to Greg's career.

Checking off the list

Greg began checking off his goals, winning the 1979 Junior World Championship Road Race in Buenos Aires, Argentina. For extra measure, he also won a silver medal in the Pursuit and a bronze in the Team Time Trial.

Winning three World Championship medals is a story in itself, but the road race stands out. As the finish neared, the pack was together. It looked like a big field sprint. With 10km to go, Greg attacked. Only one rider went with him, but this young Belgian opportunist refused to work. Greg put his head down and gave it his all. 4 Russians went to the chase, riding in team time trial formation. With 2km to go these four riders had completely strung out the field, yet Greg was single-handedly holding them off. Surely the Belgian, fresh from sitting on Greg's wheel, had the Gold already?

As the finish neared, the Belgian jumped off Greg's wheel. Somehow, even after pulling the Belgian for almost 10km, Greg found the power to sprint. Greg was starting to come back around the Belgian! In a panic, the Belgian threw a vicious hook, forcing Greg into a pile of old tires used as a race barricade. Miraculously, Greg stayed up. The hook was so obvious that the Belgian was relegated. LeMond had won!

Greg's first year as a Senior

The next year, 1980, was Greg's first as a senior competitor. He had a phenomenal spring season competing in Europe including winning a large international stage race in France, the Circuit de la Sarthe. The French press were in an uproar. It was the first time an American had won a major French stage race. With almost no team support, Greg had managed a significant win against the major European national teams, and even some Pros. Everything pointed to achieving goal #2, a Gold in the 1980 Olympic Road Race.

Unfortunately, the U.S. chose to boycott the Moscow Olympics. Missing the Olympics was a let down for Greg. Although Greg had dreamed of Olympic glory, he had not been able to envision politics entering the sporting arena.

Greg was at a cross roads; wait four years for another Olympics, or turn Pro? Unlike today, Professional racers in 1980 were not allowed to compete in the Olympics. Greg's spring season had attracted an offer from Cyril Guimard, the Directeur Sportif of the Renault professional squad. A young, eager and determined Greg LeMond accepted his first Pro contract.

Greg gave up his amateur status and quickly learned Pro racing under the tutelage of his new team mate, Bernard Hinault. Just three short years later, Greg won the 1983 World Championship Road Race in Zurich, Switzerland. On a tough, rainy circuit, LeMond broke away with 20km to go. Again, only one rider went with him. However, this time Greg was able to get his breakaway companion to do some work. Greg used tactics in perfect fashion, using

the rider to maintain his lead. Then when the time came Greg dropped him like a stone, riding in alone to beat the best road racers in the world. Goal #3 had been met, and Greg was just 22.

The Tour de France

Riding the Tour de France at just 24 years of age, Greg's final goal was within his reach. But it was not to be; here's the story. Greg was supporting the team leader, Hinault. Even working as a 'domestique', Greg had managed to place himself second in G.C. (General Classification). During the finish of one stage late in the race, Hinault had suffered a horrible crash. Suffering badly with a swollen face on the next day, in the mountains Hinault was dropped. In an attack. Greg covered the break defensively. Sitting on the wheel of the attacker, Greg had opened a gap over Hinault sufficient to make Greg 'leader on the road'. Greg was feeling great and wanted to attack. He had the yellow jersey in his grasp. But the team's manager would not let Greg attack.

The next year Greg won the '85 Tour. This victory was an emotional event, with more trouble from his own team mate, Hinault, than the rest of the field. Still, Greg had met the goal set back in high school

A small setback for Greg

During the winter of 1986, Greg was shot in a hunting accident that nearly took his young life. Carrying 40 shotgun pellets in his chest, after a lengthy recovery he went on to race again.

The comeback

Surely one of the greatest moments in sport was the final time trial of the 1989 Tour de France. Facing what was considered an insurmountable lead by French racer Fignon, Greg rode the fastest time trial in Tour history. In doing so, he beat Fignon and won the Tour by just 8 seconds. His victory was the closest time margin of any Tour on record.

In following seasons, Greg's performance eroded. Later it was determined that Greg had a rare cell disorder that could possibly be attributed to the lead in his body. Greg more or less missed three Tours between his accident and his comeback, and had his career cut short. If Greg hadn't had the hunting accident, who knows how many Tours he could have won?

Greg LeMond bicycles- The next page in Greg's history

Obviously, Greg was quite a bike racer. He had incredible talent, and an even more tremendous will to win. He also had a third advantage over his competitors; Greg used his eye for technology to his advantage.

As an example, in the final time trial of the '89 Tour, Fignon flew his ponytail in a show of French style. Meanwhile, Greg strapped on a funny looking aero helmet and bolted on an odd-shaped aero handlebar. Most of the sport laughed at these so-called 'gimmicks'. Their laughter turned to awe as LeMond did the impossible, removing Fignon's 'insurmountable' 40 second lead.

Greg's cycling position

Along with learning about training from the best coaches and sports doctors in the world, Greg also studied the relationships of a rider's bicycle position. It should be obvious from his results that something was working for him. To compliment what he learned about maximizing a cyclist's potential, he designed his own LeMond frame geometries.

Greg learned a lot about bikes when he was racing in Europe. He found that comfort and stability allow a bike rider to be fast. To execute a high speed turn in the Alps, a bike needs to have solid and predictable steering. Cornering speed is not determined by how quick a bike turns, but by the rider's ability to control a line at speed.

To provide the rider with leverage to powerfully push a big gear in the Alps, the seat must be rearward, requiring the seat tube to be laid back. Powerful climbing is not determined by how stiff the bike, but by placing the rider so that they can economically exert the most pedaling force.

And finally, to prevent fatigue on long stages a bike must be comfortable. Comfort is not determined by how soft the saddle is, but by allowing the bike to absorb road shock while distributing the rider's weight correctly.

LeMond's experience helps every cyclist

You may be a recreational rider, or a national caliber competitor on the Saturn race team. You may race for a living, or ride for simple pleasure. Either way, your riding success has Greg's inspiration behind it.

LEMOND GEOMETRY

LeMond Geometry- A different perspective

LeMond geometry is different than many of the bikes on the market today. There are many explanations for this, some useful, some not so well thought out. We'd like to suggest a different perspective here.

What's different about the geometry?

First, let's talk about what the differences are. There are several key points which vary from some bikes on the market today. The differences may be small, but when combined the effect is definitely noticeable. Understanding how they work will help you understand the 'feel' and how it will benefit your riding.

- **Matched head tube angle and fork rake.**

By carefully choosing a frame's head tube angle and matching it to a correct fork rake, frames can have a low initial stability and great final stability. This means you can have a frame that turns easily, and then when leaned over in a turn becomes increasingly more stable.

Greg has said that when Pros are descending the Alps at 80kph, they need bikes that hold a line well, not steering that is quick and reactive. When descending fast, Pros use every inch of road width. They aggressively lay the bike into a corner knowing they can't change their line. With such a narrow margin of error, it's more important that a bike hold the line than be quick turning. Greg's geometry adds stability, especially when combined with other facets of the design.

- **Slightly lower bottom bracket.**

A lower bottom bracket lowers your body on the bike, and your center of gravity. When you are closer to the ground, the bike is more stable and tracks straighter. It's true that this reduces pedal clearance, but at the extreme cornering angles and high speeds of a Pro road race the riders have their inside pedal up in the corners anyway. To Greg, feeling secure while eating or removing a rain jacket is more useful than extreme pedal clearance.

- **Increased top tube length.**

If you only look at top tube numbers, Greg's geometry may look really long. However, under a more accurate analysis the front/center is actually comparable to other good road bikes. The difference is that the seat tube is laid back. When the seat angle is laid back, it's normal for the top tube to increase in length.

- **Longer chainstays with shallower seat angle.**

Like with the longer top tube, slightly longer chainstays are a result of a shallower seat tube angle. This adds comfort and stability to a bike. For a road racer, this allows them to relax on the bike. If they expend less energy throughout the entire race, they will have more energy when the crunch comes. Shorter chainstays may add stiffness to a bike during a hard effort, but when sprinting for a stage win Greg found that feeling fresh was more useful than a stiff bike.

- **Reduced seat angle.**

Some say this is to accommodate a long femur (thighbone), but good bike fit relies on more than bone length; it also considers the physics of riding.

Another theory is that pushing the saddle rearward allows you to "pedal early", or apply pedal pressure earlier in the pedal rotation as it goes from the top (12 o'clock) position.

While either of those theories may apply in some cases, an analysis of biomechanics indicates the primary benefit of the slack seat angle is more powerful climbing through hand opposition.

Examine the dynamics of a rider in the saddle on a tough Tour climb, say something 10km long and in excess of a 10% grade. When seated on the bike most climbers ride with their hands on the top of the handlebars. This allows comfort and good breathing. They don't need to be in the drops, because climbing speeds are low enough that aerodynamics do not have much effect.

As the grade increases the pedal force increases, assuming race pace at a constant cadence. As pedal force increases, so do the opposite forces lifting you off the saddle. The force stabilizing a seated rider is partially the friction created on the saddle by gravity, partially the position of the hands relative to the saddle. As pedal force increases, it takes more force to stabilize your body. Since gravity does not increase, it requires additional opposition from your hands to keep your body quiet in the saddle. Rather than move your hands (and handlebars) to oppose your feet, the saddle is moved back so that the bars are further away. This position

improves the opposition of your hands to the force of your legs.

In order to allow the saddle to be moved back further, the seat angle must be more laid back. As an extra benefit, moving the seat back tends to flatten your back, so after you've crossed the col you can decrease your aerodynamic drag on the downhill.

Does it take a special body type to ride a bike with LeMond geometry?

From the previous discussion it should be apparent that unless you require a very forward saddle position, you should be able to ride a LeMond. Those who want to ride in a more forward attitude also have the option of using a zero-setback seatpost. You'll still get all the other LeMond benefits discussed here.

What about the 'LeMond position'?

It's true that Greg used a very long position from the saddle to the handlebars. If you move your center of gravity relative to the wheels, it changes the way the bike handles. Greg's long, laid out position allowed him to achieve good pedaling opposition yet maintain optimum weight distribution on the bike for handling those fast downhill corners. The resulting aerodynamic benefits were an added bonus.

LeMond geometry summary

The benefits of LeMond geometry are really threefold. First, LeMond bikes are built to be comfortable so you expend less energy as you pedal. Second, they allow a more rearward position that adds climbing power. Last, they handle really well; when put into a corner they are solid and predictable at high speeds, and a synergy between you and your bike (some call it a feeling of 'one-ness' with the bike) means LeMond bikes don't require extra vigilance as you ride.

LEMOND STEEL

Steel is real

Steel is the traditional material of choice for bikes, dating back to the early years of bicycling. The advantages of steel are many. Traditional steels are inexpensive to make, and inexpensive for the frame builder to work with. Steel can be welded or brazed, both easy techniques (for a skilled craftsman) that allow a creative joining of material. In other words, steel allows a freedom of design, at an affordable cost. Last, steel has excellent strength, stiffness, and fatigue resistance, all important factors when making a lightweight efficient structure like a bicycle frame. These factors should explain why steel has been the traditional choice for frame building for the last century.

It's got the feel

Over the last century, a huge number of steel bikes have been built. The early ones were ordinarys, or highwheelers. Some were fancy adult tricycles. Some were heavy paperboy specials. And some were exotic, super light racers.

The point here is that a lot of experimentation has been done with steel bike frames. Through science, or trial-and-error, steel bikes have been made of all sorts of shapes, sizes, tube diameters, and wall thicknesses. Because of the design and construction freedom of steel, lots of people have had the opportunity to experiment. Over the years, the parameters of steel bikes have become well defined. We know how light they can be made, and how to make them ride well.

Through the years, enough steel bikes have failed for us to understand what steel can and cannot be made to do. And enough designs have been ride-tested to know what rides well and what doesn't. Basically, the experience gained over the least 100 years makes the best steel bike a refined, quality machine that's as light as it can be and offers the best possible ride.

Not all steel is the same

Steel has a high modulus. In other words, it's pretty stiff. And that's true of all steel. There's hardly any difference in the stiffness of a high-end steel like Reynold's 853, and the 'tensile' steel found on a child's bike.

Likewise, 'tensile' steel and Reynolds 853 have the same density, or weight per unit volume. In other words, a cubic inch of Reynolds 853 is not any lighter than a cubic inch of tensile steel.

There is, however, a large difference in the tensile strength of the various steel alloys. This difference requires that to be equally durable, more low strength material is required to build a structure than would be needed of a high-strength material. This need for more material somewhat explains how a frame built from Reynolds 853 can be so much lighter than a tensile steel frame.

Mechanical properties vs. Finished goods

As we said earlier, steel can be joined in a number of ways. It can be bonded, riveted, welded, brazed, and more. Of these, the most popular in bike construction today is TIG welding. Welding involves heating the materials until molten, and letting them cool into a single, solid piece. Sometimes additional material is added in the form of a welding rod.

As steel is brought to these high temperatures and cooled, the molecules in the steel undergo changes. Depending on the temperatures, and the length of time at a given temperature, the molecules will reform into microscopic crystals of varying structures. There is a wide variety of crystalline structures possible, with an equally varied assortment of mechanical properties of the welded state. To simplify, we can say that welding changes the steel, and it's common for the steel to lose strength as a result of welding.

In bike frame design, a good engineer will compensate for the expected strength loss of welding. They will design the tubing to be a little thicker at the heat affected zone (HAZ) so that the end result, the finished structure, provides the required strength.

Steel technology leader

The Reynolds company of Great Britain (not the American company that makes aluminum foil) has been a leader in steel bicycle tubing since they developed the butting process in 1898.

Since 1930, racing cyclists all over the world have ridden frames built from Reynolds 531. This proprietary manganese-molybdenum steel alloy offered a blend of strength and ease of manufacture that was ideal for lugged and brazed construction.

In 1975, Reynolds introduced a very high strength steel alloy tubeset, Reynolds 753. Thanks to the extra strength, this tubing was made very thin-walled, and this had the effect of reducing frame weight considerably. 753 was more heat sensitive than 531, requiring special low-temperature brazing techniques. Due to quality concerns, Reynolds mandated that only certified builders would be allowed to purchase tubesets.

Reynolds' newest revolution of the bike tubing industry is a steel alloy dubbed 853. This material, a breakthrough in metallurgy, was designed specifically for modern TIG welding. As such, it actually gets stronger when exposed to the high heat of welding.

New construction techniques

With the advent of mountain bikes, brazed frame construction fell out of fashion. Brazing usually requires lugs to reinforce the joints. These special sockets are formed to accept specific tubing diameters, and hold them at a specific angle. The new mountain bikes of the early 80's changed bike design, using different tube diameters and joint angles than previously used by road bikes. To allow the freedom of design they needed to explore these new bikes, manufacturers switched to TIG welding.

Welding and frame weight

Although brazing steel requires that the tubes be brought to a glowing, cherry-red heat, brazing temperature does not approach the melting point of steel. By avoiding extreme heat, the steel in a brazed bike maintains its strength. With TIG welding, the steel is melted and strength is lost. To compensate, thicker tubing is used at the weld site. Thicker steel weighs more, and doesn't ride as well. The steel available simply couldn't be butted radically enough to avoid this.

New steel technology

Reynolds now addresses the performance concerns of a welded frame by a different path. Their new 853 alloy actually gets stronger after welding. Since the welded area is stronger, it can be thinner. Traditional butting and wall thickness can be used, so the new frames built with this material are actually lighter than a lugged frame. After all, there are no lugs. And the wonderful ride of tried-and-true steel is back.

LEMOND TITANIUM

Titanium history in cycling

Titanium bikes have been around for almost 30 years. During this tenure they have earned a reputation for excellent ride and durability. While the reputation of titanium is generally well deserved, there is more to a great bike frame than simply the material its made from. The high cost of titanium is wasted without purposeful design and precision manufacturing.

Research and Development

Although Greg LeMond raced titanium frames way back in '92, we wanted to take a fresh look at the current titanium technology. As a starting point we consulted Gary Helfrich, the bike industry's recognized titanium guru. For those who don't know Gary, he was a founder of Merlin Cycles. Gary's experience with different tubing dimensions, titanium alloys, and manufacturing techniques were very illuminating. Our engineering staff followed these sessions with our own extensive R&D. Armed with a clean design slate and fresh research, it was time to sit down at the computers and design a titanium road bike worthy of the LeMond label.

Which titanium?

There are many titanium alloys available for bicycle manufacture. These different alloys exhibit a wide range of mechanical properties (strength, hardness, etc.) which effect the final weight, stiffness, shock absorbency and overall ride of a bike. The physical properties of the metal also determine the available manufacturing techniques. The right material choices were essential to our ability to make a high quality, excellent riding titanium bike for a reasonable cost.

CP (Commercially Pure) titanium is available in a variety of grades listed numerically as CP1, CP2, CP3, and CP4. These different CP alloys are separated by the amount of trace elements in the alloy, and they share some of the physical properties of the more popular titanium alloys. They are strong, tough (resistant to crack propagation), and resistant to oxidation. However, they are fairly hard so they are somewhat difficult to machine or cold work. In addition, CP alloys do not have the tensile strength enjoyed by some of the other titanium alloys.

3/2.5 titanium is an alloy with 3% aluminum and 2.5% vanadium. This alloy exhibits much greater tensile strength than CP grades. With higher tensile strength, the amount of material can be reduced while retaining the same structural strength. Less material means less weight. Another benefit is that although its expensive to do so, 3/2.5 can be drawn or butted mechanically. This allowed us to achieve the tubing designs and manufacturing techniques our engineers wanted to pursue. Plus, the thin wall sections enjoyed by butted tubing allowed us to remove even more weight, while keeping the joint areas thick and strong.

Another titanium alloy we use is 6/4 titanium. 6/4 Ti has very high tensile strength, and is less likely to form a molecular bond (known as cold welding) when coupled with different metals because its very stable on a molecular level. These properties makes 6/4 ideal for fasteners like water bottle screws. However, 6/4 exhibits extreme hardness making it less than ideal for building a bike frame. Machining, butting, or other metal working with 6/4 is very difficult and expensive. We use 6/4 Ti for the dropouts of the Tete de Course where the strength is valued on a thin structure. For tubes, the perfomrance of 3/2.5 Ti offers the same performance without a weight penalty, and a much better oost.

Butting titanium

A bike frame has much higher stress loads near its joints than in the middle of the tube. Some of the joints see much higher loads than others, as exemplified by the extra high stress at the head tube/ down tube junction. To supply adequate strength, these high stress areas need a lot of material. However, in areas like the middle of the top tube there is much less stress. Where the stress is lower the tubing can be much thinner and thus lighter. To maximize strength and at the same time minimize weight, the frame tubing

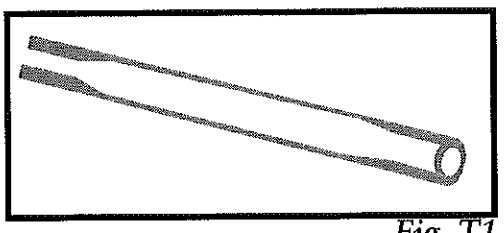

Fig. T1

must have varying thickness, or butts (Fig. T1). Butted bicycle tubing is an advantage

with any frame material, including titanium.

Butted aluminum or steel tubes are made on a drawing bench. In this manufacturing process, extreme force is applied to a tube to force it through a die while a mandrel inside the tube controls the wall thickness. Precise control of wall thickness is provided, while the mechanical working of the material adds tensile strength. The strength increase occurs because the mechanical working alters the crystalline structure of the metal. Its a win/win situation with lighter, stronger tubing as the result. Similar techniques are used to create constant wall, tapered tubes. Examples include better grades of chain stays, seat stays, and fork blades.

Titanium alloys exhibit very high toughness and hardness, physical properties that make titanium alloys difficult to butt or manipulate. Like aluminum or steel, cold working titanium orients its crystalline structure for a stronger tube that's more fatigue resistant. Also like aluminum or steel, this manipulation is expensive. Due to the exceptional hardness of titanium, the difference in cost is huge.

To reduce the cost of butting titanium, some manufacturers butt the tubes using a process called chemical milling. In chemical milling, the titanium is etched or removed with acids. Interior chemical milling of a tube must be carefully monitored for wall thickness, requiring the extra expense of working small batches. Exterior chemical milling is easier to monitor but decreases the outer diameter along with the wall thickness. This reduces the stiffness and strength of the tube. Since the metal is not worked, chemical milling does not provide the benefit of altering the crystalline structure of the titanium.

Another lower-cost method for butting titanium is to use sheet titanium that has been chemically milled, then rolled from the sheet, and finally welded into tubes. This method leaves a seam in the tube. With aluminum or steel, seams can be 'normalized' by further drawing and cold working the tube. Normalization is the process which restructures the molecules of the metal to reestablish their original mechanical properties after being weakened by heat. Due to the hardness of titanium, cold working a welded seam isn't practical. To compensate for this weakness, a seamed tube has to have extra material making it heavier than a seamless tube.

A third cost-saving method for butting titanium is outer butting, where the tube is machined on the outside. As with exterior chemical milling, this method makes a tube with constant inner diameter but varied outer diameter, reduced in the middle. The reduced outer diameter means lower stiffness and strength.

LeMond butted titanium tubing (Victoire and Tete de Course)-

Recent advances allow 3/2.5 titanium to be butted in the traditional way of steel tubing, on a drawing bench. Its expensive, but provides optimal tubing shapes and outer diameters, exacting precision, and works the crystalline structure of the tube to increase the tensile strength. The upper-end LeMond titanium models take full advantage of this new technology throughout the frame. Although you can't see it, the main triangle is double butted.

The same processes used to butt a constant outer diameter tube in the main triangle is used to create the constant wall, tapered stays (Fig T2).

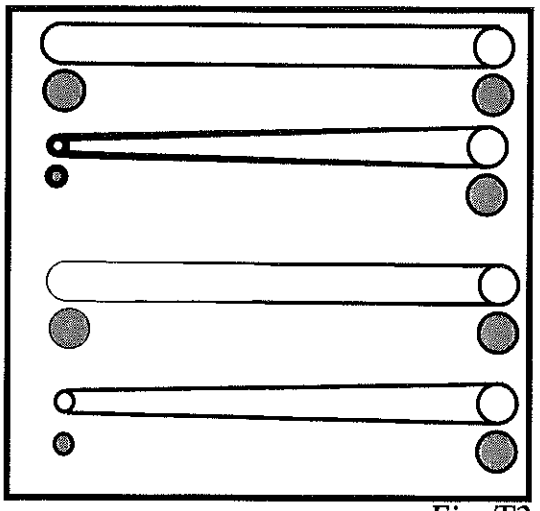

Fig. T2

Most titanium bikes use constant diameter, constant thickness stays. This is the cheapest way of making stays. Compromises must be made between the stiffness needed at the bottom bracket and seat tube (defined by the outer diameter at those joints) and comfort (defined by the outer diameter at the dropouts).

A simple swage of a constant-wall cylinder results in tapered stays, but with thicker material at the dropouts. This would probably ride better, but the additional material

makes the bike heavier.

It takes several steps to make the LeMond stays. First, a constant-wall cylinder is swaged so that the dropout end is much more thin-walled. Then the tube is tapered from the outside. All this metal manipulation is expensive, but the result is a constant-wall tapered stay. This makes for a lighter bike that rides better, and the stays blend in beautifully with the seat tube and custom dropouts. But there's more than looks to these expensive stays. The shapes and wall thicknesses allow the stays to stiffen the bottom bracket without a weight penalty. Like on high end aluminum or steel bikes, the tapered stays put comfort into the rear end of a Ti bike, something that's been missing on Ti bikes trying to cut costs with ugly, constant outer diameter stays.

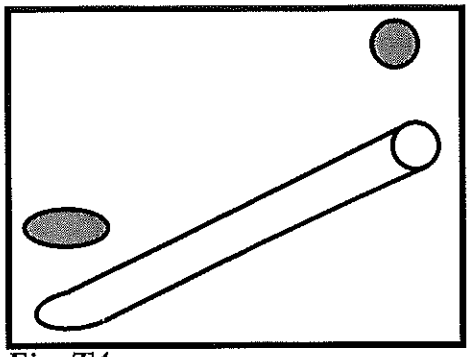

Fig. T4

While we were maximizing the LeMond stays, we also dramatically shaped the tubes in the main triangle to accentuate their ride qualities. The down tube has been formed (Fig. T4). The lower end is wider than tall. This provides increased lateral rigidity at the bottom bracket.

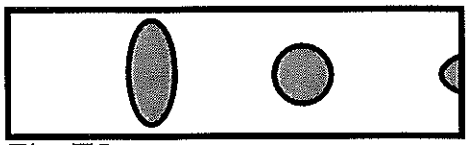

Fig. T5

The stiffness of a tube in a given direction is determined by the length of the axis in the plane in which the force is applied (Fig. T5). By using an oval shape, the tube gains stiffness in the plane where its wider, and the smaller axis across the oval has a decrease in stiffness This allows us to tune the ride. In addition, stiffness in a structure like a bike frame can also add to its strength, since stiffness is resistance to deflection, and you must deflect the frame before you can bend it.

In addition to the performance increase of our design, shaping the tubes has other benefits. Tubes shaped in this way provide a greater weld area, directly increasing the frame strength.

As a final detail, we matched the tubing diameters to create a consistent look throughout the LeMond line. This thoughtful design means the titanium models fit the parts of the other LeMond models (except the custom LeMond headset). This makes it easier for dealers to stock the parts that work on LeMond models. After all, any race mechanic spending his nights prepping a fleet of team bikes will tell you a racing bike needs to be easy to service.

All these tubing details are expensive, but our research showed that when done right, the value of the extra work was appropriate considering the added performance. In other words, you really can feel our work in the ride of these bikes. We've taken LeMond performance to a new level.

Frame design: Geometry

Once we determined the best tubes for our frames, it was time to create a design which used those materials to their advantage. Of course, we already knew what the geometry should be. Greg's geometry has a proven pedigree. The geometry of the new Ti frame is identical to the popular LeMond Zurich in angles and tube lengths.

For the mechanic

Grease threads

Titanium alloys such as 3/2.5 have a tendency to create a permanent or semi-permanent bond known as cold welding when exposed to certain other metals. Its very important to adequately prepare fasteners used on titanium threads. A heavy grease will work, and Anti-Seize is even better.

"Drop-in" headset

Instead of pressing a cup into the head tube to hold the headset bearings, they sit inside the specially machined head tube. Supported directly by the head tube, the weight of the cups is eliminated. Without cups, the headset becomes almost a zero stack height, so the head tube can be taller. The taller head tube allows greater separation between the down tube and top tube for

MIXED MATERIALS: TITANIUM AND CARBON

Towards the end of his career, looking for a competitive advantage, Greg rode both carbon fiber and titanium frames built to his specifications. He liked the ride of the titanium bike, but he used the carbon bike for its low weight.

Not everyone can own two great frames.

Now, with the LeMond Tete de Course, you don't need to. We've combined into one frame the low weight of carbon and with the feel of titanium in a unique way that makes one bike that offers the best of both worlds.

The goal

Create the ultimate Titanium bike by reducing weight, increasing lateral stiffness, maintaining the "Ti feel", and staying true to Greg LeMond's vision of how a Professional road racing bike should perform.

The design

This is a bike meant to ride and feel like a Ti bike, but utilize the benefits of our vast array of materials science to improve the classic Ti bike where appropriate.

Titanium is known for its durability. The most heavily stressed part of a a bike frame is its head tube area, in particular the joints between the head tube and its top tube and down tube. We used titanium here for its high fatigue strength.

Probably the most abused area of a bike frame is the bottom bracket and chainstays. This part of the bike gets pummeled by the chain, even in normal riding. Occasionally through accident the moving chain grinds directly on the chainstays, like in a mis-shift or chain suck. We used titanium here for it hardness and resistance to wear.

The area around the bottom bracket, especially between the tire and chainrings, is very tight. There is not a lot of room for large diameter tubing. At the same time, this is a high stress area. We used titanium in this area for its high strength.

The top tube, seat tube, and seat stays of a bike are under low stress so can be made very light. We used carbon here for its extremely low density.

The sensations at the saddle, like normal road vibrations, have a lot to do with way we perceive comfort on a bike. The seat lug is surrounded by the top tube, seat tube, and seat stays. We used carbon in all these tubes for it vibration damping qualities.

Besides the saddle, the other weight-bearing contact point on the bike is your hands. They, too, will get a silky ride on the carbon composite fork. Titanium 6/4 is extremely hard, stiffer than aluminum, and incredibly strong. We built the rear dropouts of 6/4 titanium.

Geometry

Greg's geometry has withstood the test of time, and gets consistent rave revues for precise high-speed handling and all-day ride comfort. Why mess with a winner; we used Greg's geometry on the Tete de Course, but with a nod to style plus a few small modifications to squeeze even more performance out of the ride. To optimize the weight and stiffness, we slightly dropped the seat cluster along with the rear of the top tube. This 'sloping' design does not change the fit or the handling LeMond bikes are know for. It simply changes the look, and produces a little more standover clearance so the sizing may be more versatile. While we were at it, we also tweaked the chainstay length and bottom bracket height of each frame size to give every size of rider the same outstanding ride.

Ride

The way this bike feels is nothing short of dreamy. Stomp the pedals and the bike responds like a titanium LeMond Victoire. Throw it into a corner and the Tete de Course steers like any other LeMond; smooth and predictable. Finish a century and you won't believe how fresh you feel. There is just nothing to compare to. This bike will definitely bring on a big smile (and a touch of envy from your friends.

LEMOND FORKS

LeMond bicycles use a variety of forks throughout the line. Here we explain those forks.

Reynolds Ouzo Pro

Reynolds is known as a leading manufacturer of steel bicycle tubing for over a century. Now this company makes bicycle products from other cutting-edge technologies.

As an example, Reynolds Composites manufactures the Ouzo Pro fork found on the LeMond Tete de Course. This carbon fiber composite fork is a prime example of the new technologies being developed by Reynolds. In addition to carbon fiber fork blades, the Ouzo Pro also incorporates a carbon crown and steerer.

In addition to reading about the technology behind the forks, please also refer to *"Carbon Steerer Maintenance,"* appendix page 'd'.

Complimentary performance

The usage of carbon in place of parts traditionally built from steel or aluminum creates a very light weight structure. Careful design creates a fork with excellent road feel. Together, these features lend themselves very well to the titanium frame of the LeMond Tete de Course, making this an excellent riding bicycle.

Bontrager Race Lite

The Bontrager Race Lite fork replaces our

Air Rail, and is a huge improvement. The fork legs are made from OCLV 110 carbon fiber composite for very high strength. The Race Lite has straight legs, which further reduces the weight. An aluminum crown and steerer make this a robust fork that performs.

Some straight forks may feel harsh, but with carbon technology our engineers have tuned the feel of this fork. The aggressive look yields a suprisingly pleasant ride, nicely complimenting the LeMond ride oveerall.

Bontrager Race

The Bontrager Race fork replaces our Carbon Classic, and is a huge improvement. Not only that, but we love this fork so much we've also used it to replace many of the steel forks on our 2003 models. Sure, it's more expensive. But we're sure you'll feel the improvement in the ride, so it's worth the extra money in the long run.

The Race fork looks exactly like its more expensive cousin, but uses OCLV 150 carbon composite. The resulting ride is almost identical, but a few grams

SUGAR

2003

The Sugar frame was completely revised for 2002. No changes have been made for 2003.

Geometry

The Sugar uses Fisher's race-proven Genesis Geometry. This design provides nimble handling, high speed stability, and allows you to stay centered over the bike so in rough terrain instead of sliding off the back of the saddle, you can apply pedal power.

Ride

The Sugar's frame offers outstanding pedaling efficiency. This exceptional frame rigidity also gives the Sugar its 'riding on rails' cornering ability.

The Sugar design feels like a hardtail much of the time, but without the jarring of rigid stays. It climbs well out of the saddle, it smoothens small bumps for comfort, and has incredible traction. The traction advantages are full-time, both climbing and braking hard. The combination of great feel and low weight makes the Sugar ideal for racing in technical terrain, or just having fun on a short ride after work. Its a great all-round riding bike. And since the weight penalty is less than a full water bottle, it makes riding a hard tail seem almost pointless for a lot of people.

Frame details

The Sugar uses Platinum series ZR9000 aluminum frame technology. A very oversize, butted and shaped down tube creates a rigid structure between the bottom bracket and head tube, for frame stiffness and strength. Speaking of frame strength, we even added a big butterfly gusset under the head tube.

The head tube is butted, with a thin midsection for low weight, but heavy duty walls to support the headset cups.

Full top tube cable routing keeps the cables out of the muck for friction free shifting and braking.

The B*Link design of the Sugar adds rear end torsional and lateral rigidity. By keeping the connection between the frame and swingarm stiff, handling is better. So is pivot durability. Loose pivots allow a frame to flex, as well as squeak and wear.

The fittings, like dropouts and shock mounts, on the Sugar are almost all forged aluminum. Forging provides the highest structural integrity, while the low density of the aluminum keeps the bike light.

The Sugar uses a special dropout to accommodate a disc brake adapter. This adapter provides mounting for an International style rear disc brake.

All Sugar bikes have 2 water bottle mounts.

Special parts

Disc brake adapter	210648
Seat collar	211488
Derailleur hanger	230026

For rear suspension parts, refer to *Sugar pivot service (all models)* on pages E-F

	Frame sizes	15.5	17.5	19	21
	Head angle	71.0	71.5	71.5	71.5
	Seat angle	73.5	73.5	73.5	73.5
MILLIMETERS	Standover	691	703	714	724
MILLIMETERS	Seat tube	396	446	484	535
MILLIMETERS	Head tube	90	105	125	145
MILLIMETERS	Eff top tube	582	608	628	647
MILLIMETERS	Chainstays	415	415	415	415
MILLIMETERS	BB height	303	303	303	303
MILLIMETERS	Offset	41.9	41.9	41.9	41.9
MILLIMETERS	Trail	71	68	68	68
MILLIMETERS	Wheelbase	1055	1077	1098	1117
INCHES	Standover	27.2	27.7	28.1	28.5
INCHES	Seat tube	15.6	17.6	19.1	21.1
INCHES	Head tube	3.5	4.1	4.9	5.7
INCHES	Eff top tube	22.9	23.9	24.7	25.5
INCHES	Chainstays	16.3	16.3	16.3	16.3
INCHES	BB height	11.9	11.9	11.9	11.9
INCHES	Offset	1.6	1.6	1.6	1.6
INCHES	Trail	2.8	2.7	2.7	2.7
INCHES	Wheelbase	41.5	42.4	43.2	44.0

Sugar Team Issue

RIDING STYLE ..... **Race**

FRAMESET

MAIN TUBES	Platinum series butted ZR9000	
STAYS	Carbon fiber composite	
FORK	Manitou Skareb Super	
	80	*Travel, mm*
	454.0	*Axle-crown length, mm*
REAR SHOCK	Fox Float RL, with handlebar lockout	
	2	*Stroke*
	7.875	*Length*
	22.2mm	*Width*
	6mm	*Eyes*
HEADSET	Cane Creek S-6 Aheadset, alloy	
	25.4/34.0/30.0	*Size*
	27.1	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Race Lite	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Race Lite	
	39.5	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano XTR, Dual Control	
BRAKE LEVERS	Integrated brake/shift	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano XTR	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8", high clamp only	*Attachment*
RR DERAILLEUR	Shimano XTR Rapid Rise	
CRANKSET	Shimano XTR 44/32/22	
	146/102/64	*Bolt hole circle, mm*
BB	Shimano XTR, integral axle	
	73 x 135.5, Integral to crank	*Shell x axle, mm*
CHAIN	Shimano HG-92	
	9 speed	*Chain type*
	108	*Chain length (links)*
CASSETTE	Shimano XTR 11-34, 9spd	

WHEELSET

FRONT WHEEL	Bontrager Race X Lite ATB, tubeless, 28°	
	603	*E.R.D., mm*
	Velox 22mm	*Rim strip*
REAR WHEEL	Bontrager Race X Lite ATB, tubeless, 28°	
	603	*E.R.D., mm*
	Velox 22mm	*Rim strip*
TIRES	IRC Serac XC, tubeless	
	26 x 2.1	*Tire size*
SPOKES	DT 14/15G butted SS, ProLock alloy nipples	
	298/300, 3x	*Front, mm*
	298/297, 3x	*Rear, mm*
INNER TUBES	Presta valve, ultra light; for display	

OTHER

SEATPOST	Bontrager Race	
	31.6	*Outer diameter, mm*
SADDLE	Titec Ithys Gove, titanium rails	
BRAKES	Avid SD Ultimate, linear pull	
PEDALS	not supplied	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral bolt	
	36.4	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts (1 on seatpost), replaceable derailleur hanger	

COLORS

Yellow Pearl HT/Blue Metallic • Yellow decal • Red fork

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	66.2	69.6	72.7	74.7
	Cm	168	177	185	190
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	75	90	105	105
	Angle	7	7	7	7
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	330	390	390	390
Steerer	Length, mm	182.6	197.6	217.6	237.6

FRAME AND FORK HIGHLIGHTS

B*link suspension gives 2.8 inches rear wheel travel while adding lateral rigidity for control. Genesis geometry provides long front center plus short stem for stability and enhanced steering response
ZR9000 Platinum series aluminum- light weight with very high fatigue strength. Fork has Reverse Arch for stiffness and steering control. Hollow forged crown, alloy steerer, and 28.6mm stanchions for reduced weight. Air/coil springs and TPC (Twin Piston Chamber) damping with lockout for high performance and outstanding climbing. Semi-bath lubrication.

COMPONENTS HIGHLIGHTS

Shimano XTR drivetrain and shifting is the choice of the Pros; precise, light weight, and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight. Lookout adds climbing power.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels- engineered for low maintenance, high performance. Extremely light DT Revolution spokes and alloy nipples mean low weight for quick acceleration. The tubeless-compatible rims let you choose between standard tires and the tubeless system. No tubes = no pinch flats.

GEARING

	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)

27.6 lb.
12.53 kg.

SUGAR 29"

New for 2003

The Sugar 29" frame is an evolution of the 2002 Sugar, with an emphasis on the adventure rider. It incorporates the frame features of the Sugar+ for adjustable travel, and is now an even better adventure bike, thanks to the 29" wheels.

The Sugar 29 incorporates ZR9000 aluminum for reduced weight and increased strength. ZR9000 is stronger, so we need less of it to result in the same frame strength. To make it a great adventure bike, the new 2003 Sugar 29 will even accept some 2.35" tires.

While reducing the frame weight, we increased the frame stiffness with a 2 inch (54mm) downtube, beefed up 'seatstays', and added the Sybil link.

The key to the versatility of the Sugar 29 is the Sybil link. This unique design allows you to change the performance of this bike from a tight and taught racing feel to the ground-hugging cush of a long travel adventure bike. By simply moving the bolt on the Sybil link and adjusting the fork travel, you completely change the feel of the bike. And an important note if you're looking at some other brand of adjustable suspension- when you change the Sugar 29 there is no need to re-inflate the rear shock. And another point- when you readjust the Sugar 29, the sweet Genesis steering geometry remains the same, unless you decide to go really long with the fork adjustment- some of the forks we spec'd adjust out to 125mm of travel!

Geometry

The Sugar 29 uses Fisher's race-proven Genesis Geometry, adapted for the larger wheels. This design provides nimble handling, high speed stability, and allows you to stay centered over the bike so in rough terrain instead of sliding off the back of the saddle, you can apply pedal power.

Ride

The Sugar's frame offers outstanding pedaling efficiency. This exceptional frame rigidity also gives the Sugar its 'riding on rails' cornering ability.

The Sugar 29 design, when in its short travel, 80mm mode, feels like a hardtail. It climbs well out of the saddle, it smoothes small bumps for comfort, and has incredible traction. When it its long travel, 4.6" (117mm) mode, the Sugar+ feels cushy and ultra-smooth. However, unlike bouncy bikes of the past the Sugar 29 traction advantages are full-time, both climbing and braking hard. The combination of great feel and low weight makes the Sugar 29 ideal in technical terrain, or just having fun on a short ride after work.

Sugar 29				
	Frame sizes	15.5	17.5	19	21
	Head angle	71.5	71.5	71.5	71.5
	Seat angle	73.5	73.5	73.5	73.5
MILLIMETERS	Standover	685	708	736	742
	Seat tube	394	446	484	535
	Head tube	80	80	90	110
	Eff top tube	590	608	628	647
	Chainstays	467	467	467	467
	BB height	291	291	291	291
	Offset	39	39	39	39
	Trail	83	83	83	83
	Wheelbase	1092	1110	1130	1150
INCHES	Standover	27.0	27.9	29.0	29.2
	Seat tube	15.6	17.6	19.1	21.1
	Head tube	3.1	3.1	3.5	4.3
	Eff top tube	23.2	23.9	24.7	25.5
	Chainstays	18.4	18.4	18.4	18.4
	BB height	11.4	11.4	11.4	11.4
	Offset	1.5	1.5	1.5	1.5
	Trail	3.3	3.3	3.3	3.3
	Wheelbase	43.0	43.7	44.5	45.3

Special parts

Disc brake adapter 210648
Seat collar 211488
Derailleur hanger 230026

Sugar 292

RIDING STYLE ..... Adventure

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS ..... Carbon fiber composite
FORK .....Marzocchi Marathon SL
80 — *Travel, mm*
479.0 — *Axle-crown length, mm*
REAR SHOCK .....Fox Float R, air/oil, adjustable rebound
2 — *Stroke*
7.875 — *Length*
22.2mm — *Width*
6mm — *Eyes*
HEADSET .....Cane Creek S-6 Aheadset, alloy
25.4/34.0/30.0 — *Size*
27.1 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Race Lite
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Race Lite
39.5 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Deore XT RapidFire SL
BRAKE LEVERS ....Avid SD-7, long pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore XT
Top pull — *Cable routing*
34.9 mm/ 1 3/8", high clamp only — *Attachment*
RR DERAILLEUR ...Shimano XTR SGS
CRANKSET .....Bontrager Race Lite 44/32/22
64/104 — *Bolt hole circle, mm*
BB .....TruVativ Isis
73 x 113, Splined, ISIS — *Shell x axle, mm*
CHAIN .....Shimano HG-72
9 speed — *Chain type*
110 — *Chain length (links)*
CASSETTE .....Shimano Deore XT 11-34, 9spd

WHEELSET

FRONT WHEEL ....Btgr Race Lite ATB 29", disc compatible, 28°
603 — *E.R.D., mm*
Velox 22mm — *Rim strip*
REAR WHEEL .....Btgr Race Lite ATB 29", disc compatible, 28°
603 — *E.R.D., mm*
Velox 22mm — *Rim strip*
TIRES .....IRC Notos XC, folding, 127tpi
29 x 2.1 — *Tire size*
SPOKES .....DT 14/15G butted SS, ProLock alloy nipples
298/300, 3x — *Front, mm*
298/297, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Race
31.6 — *Outer diameter, mm*
SADDLE .....Titec Ithys Amore
BRAKES .....Avid SD Ultimate, linear pull
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
36.4 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 on seatpost), replaceable derailleur hanger

COLORS

Pearl Yellow HT/Prime Blue • Yellow decal

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.4	71.3	74.4	76.3
	Cm	174	181	189	194
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	75	90	105	105
	Angle	7	7	7	7
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	330	390	390	390
Steerer	Length, mm	172.6	172.6	182.6	197.6

FRAME AND FORK HIGHLIGHTS

Sybil link suspension- adjustable rear wheel travel from 2.8 to 4.1 inches (80 to 105mm) makes it suitable for many riding styles or terrains. Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. 29" wheels roll over bumps with less effort, making the bike faster. Fork has Doppio air spring with both positive and negative springs. ECC (Extension Control Cartridge) provides 5 position rebound adjustment and lockout.

COMPONENTS HIGHLIGHTS

Shimano XTR and Deore XT shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance, with high performance. The Race Lite wheels use butted spokes and alloy nipples for low weight. The disc-compatible design allows disc brakes to be added without changing hubs. Tires have reduced knob size for low weight, low rolling resistance.

GEARING

	22	32	44
11	58	84	116
13	49	71	98
15	43	62	85
17	38	55	75
20	32	46	64
23	28	40	55
26	25	36	49
30	21	31	43
34	19	27	38

BIKE WEIGHT (est.)

27.6 lb.
12.53 kg.

Sugar 293

RIDING STYLE ..... **Adventure**

FRAMESET

MAIN TUBES	Platinum series butted ZR9000	
STAYS	Carbon fiber composite	
FORK	Marzocchi MX Pro ETA 29	
	80	*Travel, mm*
	479.0	*Axle-crown length, mm*
REAR SHOCK	Fox Float R, air/oil, adjustable rebound	
	2	*Stroke*
	7.875	*Length*
	22.2mm	*Width*
	6mm	*Eyes*
HEADSET	Alloy aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	27.0	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Select	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Comp	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore LX RapidFire+	
BRAKE LEVERS	Avid SD-5, long pull	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore LX	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8", high clamp only	*Attachment*
RR DERAILLEUR	Shimano Deore XT SGS	
CRANKSET	Bontrager Race 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Tru-Vativ, ISIS splined	
	73 x 113, Splined, ISIS	*Shell x axle, mm*
CHAIN	Shimano HG-53	
	9 speed	*Chain type*
	110	*Chain length (links)*
CASSETTE	SRAM 7.0 11-34, 9spd	

WHEELSET

FRONT WHEEL	Btgr Race ATB 29", disc compatible, 28°	
	603	*E.R.D., mm*
	Velox 22mm	*Rim strip*
REAR WHEEL	Btgr Race ATB 29", disc compatible, 28°	
	603	*E.R.D., mm*
	Velox 22mm	*Rim strip*
TIRES	IRC Mythos XC-II, folding	
	29 x 2.1	*Tire size*
SPOKES	DT 14/15G butted SS, ProLock alloy nipples	
	297/299, 3x	*Front, mm*
	297/298, 3x	*Rear, mm*
INNER TUBES	Presta valve	

OTHER

SEATPOST	Bontrager Sport	
	31.6	*Outer diameter, mm*
SADDLE	Titec Ithys Amore	
BRAKES	Avid Single Digit 3, linear pull	
PEDALS	Shimano SPD M515, clipless	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral bolt	
	36.4	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts (1 on seatpost), replaceable derailleur hanger	

COLORS

Red Metallic HT/Red • White decal

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.4	72.0	75.0	76.9
	Cm	174	183	191	195
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	75	90	105	105
	Angle	5	5	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	174.0	174.0	184.0	199.0

FRAME AND FORK HIGHLIGHTS

Sybil link suspension- adjustable rear wheel travel from 2.8 to 4.1 inches (80 to 105mm) makes it suitable for many riding styles or terrains. Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. 29" wheels roll over bumps with less effort, making the bike faster. Fork has air spring and magnesium lowers for low weight. SSV (Speed Sensitive Damping) for smooth feel, increased control over varying bump sizes. 30mm stanchions provide stiffness for steering control. External travel adjust changes ride height, ideal to set up for climbing

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Race wheels use butted spokes and alloy nipples for lower weight. Disc-compatible hubs allow addition of disc brakes without rebuilding the wheels.

Tire has very versatile tread pattern which works great almost anywhere. Folding tire beads reduce weight.

GEARING

	22	32	44
11	58	84	116
13	49	71	98
15	43	62	85
17	38	55	75
20	32	46	64
23	28	40	55
26	25	36	49
30	21	31	43
34	19	27	38

BIKE WEIGHT (est.)

27.6 lb.
12.53 kg.

SUGAR +

New in 2002

The Sugar+ frame was first introcued in 2002, and remains unchanged for 2003. The "+" in Sugar+ denotes adjustable travel and geometry, with an emphasis on the adventure rider. It also incorporates many of the features of the new 2002 Sugar frame technology.

The Sugar+ incorporates ZR9000 aluminum for reduced weight and increased strength. ZR9000 is stronger, so we need less of it to result in the same frame strength. To make it a great adventure bike, the new 2002 Sugar+ will even accept some 2.35" tires.

At the same time we were reducing the weight, we managed to increase the frame stiffness. We increased the diameter of the downtube to 2 inches (54mm). We greatly beefed up the 'seatstays'. And the new Sybil link is also torsionally much more rigid.

The key to the versatility of the Sugar+ is the Sybil link. This unique design allows you to change the performance of this bike from a tight and taught racing feel to the ground-hugging cush of a long travel adventure bike. By simply moving the bolt on the Sybil link and adjusting the fork travel, you completely change the feel of the bike. And an important note if you're looking at some other brand of adjustable suspension- when you change the Sugar+ there is no need to re-inflate the rear shock. And another point- when you readjust the Sugar+, the sweet Genesis steering geometry remains the same (unless you decide to go really long with the fork adjustment- some of the forks we spec'd adjust out to 125mm of travel!).

Geometry

The Sugar uses Fisher's race-proven Genesis Geometry. This design provides nimble handling, high speed stability, and allows you to stay centered over the bike so in rough terrain instead of sliding off the back of the saddle, you can apply pedal power.

Ride

The Sugar's frame offers outstanding pedaling efficiency. This exceptional frame rigidity also gives the Sugar its 'riding on rails' cornering ability.

The Sugar+ design, when in its short travel, 80mm mode, feels like a hardtail.

Sugar+

	Frame sizes	16	17.5	19	21
	Head angle	71.0	71.5	71.5	71.5
	Seat angle	73.5	73.5	73.5	73.5
MILLIMETERS	Standover	691	703	714	724
	Seat tube	396	446	484	535
	Head tube	90	105	125	145
	Eff top tube	582	608	628	647
	Chainstays	415	415	415	415
	BB height	303	303	303	303
	Offset	41.9	41.9	41.9	41.9
	Trail	71	68	68	68
	Wheelbase	1055	1077	1098	1117
INCHES	Standover	27.2	27.7	28.1	28.5
	Seat tube	15.6	17.6	19.1	21.1
	Head tube	3.5	4.1	4.9	5.7
	Eff top tube	22.9	23.9	24.7	25.5
	Chainstays	16.3	16.3	16.3	16.3
	BB height	11.9	11.9	11.9	11.9
	Offset	1.6	1.6	1.6	1.6
	Trail	2.8	2.7	2.7	2.7
	Wheelbase	41.5	42.4	43.2	44.0

Sugar+ GS

	Frame sizes	16	17.5
	Head angle	71.0	71.5
	Seat angle	73.5	73.5
MILLIMETERS	Standover	713	724
	Seat tube	405	432
	Head tube	90	105
	Eff top tube	566	594
	Chainstays	420	420
	BB height	312	312
	Offset	38.0	38.0
	Trail	74	71
	Wheelbase	1045	1069
INCHES	Standover	28.1	28.5
	Seat tube	15.9	17.0
	Head tube	3.5	4.1
	Eff top tube	22.3	23.4
	Chainstays	16.5	16.5
	BB height	12.3	12.3
	Offset	1.5	1.5
	Trail	2.9	2.8
	Wheelbase	41.2	42.1

It climbs well out of the saddle, it smoothes small bumps for comfort, and has incredible traction. When it its long travel, 4.1"

Special parts

Disc brake adapter 210648
Seat collar 211488
Derailleur hanger 230026

Sugar 2+

RIDING STYLE ..... **Adventure**

FRAMESET

MAIN TUBES	Platinum series butted ZR9000	
STAYS	Platinum series aluminum	
FORK	Fox Talas R, 80-125 mm adjustable travel	
	100	*Travel, mm*
	471.0	*Axle-crown length, mm*
REAR SHOCK	Fox Float R, air/oil, adjustable rebound	
	2	*Stroke*
	7.875	*Length*
	22.2mm	*Width*
	6mm	*Eyes*
HEADSET	Alloy aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	27.0	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Crowbar Race	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Race	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore XT RapidFire SL	
BRAKE LEVERS	Integrated brake/shift	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore XT	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8", high clamp only	*Attachment*
RR DERAILLEUR	Shimano XTR SGS	
CRANKSET	Bontrager Race 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Tru-Vativ, ISIS splined	
	73 x 113, Splined, ISIS	*Shell x axle, mm*
CHAIN	Shimano HG-72	
	9 speed	*Chain type*
	108	*Chain length (links)*
CASSETTE	Shimano HG70 11-32, 9spd	

WHEELSET

FRONT WHEEL	Btgr Race ATB, tubeless compatible, 24°	
	539	*E.R.D., mm*
	Tubeless	*Rim strip*
REAR WHEEL	Btgr Race ATB, tubeless compatible, 28°	
	539	*E.R.D., mm*
	Tubeless	*Rim strip*
TIRES	IRC Backcountry	
	26 x 2.25	*Tire size*
SPOKES	DT 14/15G butted stainless, alloy nipples	
	251, Radial	*Front, mm*
	265/267, 3x	*Rear, mm*
INNER TUBES	Presta valve	

OTHER

SEATPOST	Bontrager Race	
	31.6	*Outer diameter, mm*
SADDLE	Titec Ithys Amore	
BRAKES	Avid Single Digit 5, linear pull	
PEDALS	Shimano SPD M515, clipless	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral bolt	
	36.4	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts (1 on seatpost), replaceable derailleur hanger	

COLORS

Silver HT/Black • Silver decal • Matte Silver fork

FIT

Frame	Size	16	17.5	19	21
Rider height	Inches	67.0	71.3	74.1	76.8
	Cm	170	181	188	195
Handlebar	Width, mm	630	630	630	630
Stem	Length, mm	70	90	100	110
	Angle	10	10	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	390	390	390
Steerer	Length, mm	184.0	199.0	219.0	239.0

FRAME AND FORK HIGHLIGHTS

Sybil link suspension- adjustable rear wheel travel from 2.8 to 4.1 inches (80 to 105mm) makes it suitable for many riding styles or terrains. Genesis geometry is defined by long front center plus short stem for stability and enhanced steering precision and durability. External rebound damping adjustment allows tuning of suspension 'feel', adding control. TALAS (Totally Adjustable Linear Air Spring) changes amount of travel and overall fork performance.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Race wheels use butted spokes and alloy nipples for lowerweight. Tubeless compatible wheel design allows you to choose regular or tubeless tires. Big tire casing floats on soft soil. Large contact patch increases traction.

GEARING

	22	32	44
11	52	76	105
12	48	70	96
14	41	60	82
16	36	52	72
18	32	47	64
21	27	40	55
24	24	35	48
28	21	30	41
32	18	26	36

BIKE WEIGHT (est.)

27.2 lb.
12.35 kg.

Sugar 3+

RIDING STYLE ..... Adventure

FRAMESET

MAIN TUBES	Platinum series butted ZR9000	
STAYS	Platinum series aluminum	
FORK	RockShox Duke XC, U-Turn adjustable travel (63-108mm)	
	80	*Travel, mm*
	451	*Axle-crown length, mm*
REAR SHOCK	Fox Float R, air/oil, adjustable rebound	
	2	*Stroke*
	7.875	*Length*
	22.2mm	*Width*
	6mm	*Eyes*
HEADSET	Alloy aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	27.0	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Crowbar Sport	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Select	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore LX RapidFire+	
BRAKE LEVERS	Avid SD-5, long pull	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore LX	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8", high clamp only	*Attachment*
RR DERAILLEUR	Shimano Deore XT SGS	
CRANKSET	Bontrager Race 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Tru-Vativ, ISIS splined	
	73 x 113, Splined, ISIS	*Shell x axle, mm*
CHAIN	Shimano HG-53	
	9 speed	*Chain type*
	108	*Chain length (links)*
CASSETTE	SRAM 7.0 11-34, 9spd	

WHEELSET

WHEELS	Bontrager Select ATB, 24° front, 28° rear	
	541	*E.R.D., mm*
	Velox 19mm	*Rim strip*
TIRES	IRC Backcountry	
	26 x 2.25	*Tire size*
SPOKES	DT 14/15G butted SS, ProLock alloy nipples	
	254, Radial	*Front, mm*
	268/269, 3x	*Rear, mm*
INNER TUBES	Presta valve	

OTHER

SEATPOST	Bontrager Sport	
	31.6	*Outer diameter, mm*
SADDLE	Titec Ithys Amore	
BRAKES	Avid Single Digit 3, linear pull	
PEDALS	Shimano SPD M515, clipless	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral bolt	
	36.4	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts (1 on seatpost), replaceable derailleur hanger	

FRAME AND FORK HIGHLIGHTS

Sybil link suspension- adjustable rear wheel travel from 2.8 to 4.1 inches (80 to 105mm) makes it suitable for many riding styles or terrains. Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Fork has Hydra Air springs for reduced weight, excellent small bump sensitivity. Large 30mm stanchions add steering control. U-Turn adjustment changes travel to any setting between 63-108mm with external knob on top of fork. Upper tube has gradients marked for easy reference.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance, with high performance. The Select ATB wheelset uses butted spokes with alloy nipples for low weight. Big tire casing floats on soft soil. Large contact patch increases traction.

FIT

Frame	Size	16	17.5	19	21
Rider height	Inches	66.2	69.7	73.1	75.0
	Cm	168	177	186	191
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	75	90	105	105
	Angle	5	5	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	179.0	194.0	214.0	234.0

GEARING			
	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)
27.6 lb.
12.53 kg.

Sugar 3+ Disc

RIDING STYLE..... Adventure

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS .....Platinum series aluminum
FORK .....RockShox Duke XC, U-Turn adjustable travel (63-108mm)
80 — *Travel, mm*
450.0 — *Axle-crown length, mm*
REAR SHOCK .....Fox Float R, air/oil, adjustable rebound
2 — *Stroke*
7.875 — *Length*
22.2mm — *Width*
6mm — *Eyes*
HEADSET .....Alloy aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
27.0 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Select
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Deore LX RapidFire+
BRAKE LEVERS ....Hydraulic, attached to brake
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore LX
Top pull — *Cable routing*
34.9 mm/ 1 3/8", high clamp only — *Attachment*
RR DERAILLEUR ...Shimano Deore XT SGS
CRANKSET .....Bontrager Race 44/32/22
64/104 — *Bolt hole circle, mm*
BB .....Tru-Vativ, ISIS splined
73 x 113, Splined, ISIS — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....SRAM 7.0 11-32, 9spd

WHEELSET

WHEELS .....Btgr Race ATB Disc, tubeless compatible, 28°
537 — *E.R.D., mm*
Tubeless, asymmetric — *Rim strip*
TIRES .....IRC Backcountry
26 x 2.25 — *Tire size*
SPOKES .....DT 14/15G butted SS, ProLock alloy nipples
266/264, 3x — *Front, mm*
264/265, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
31.6 — *Outer diameter, mm*
SADDLE .....Titec Ithys Amore
BRAKES .....Hayes HFX-9, hydraulic disc
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
36.4 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 on seatpost), replaceable derailleur hanger

FRAME AND FORK HIGHLIGHTS

Sybil link suspension- adjustable rear wheel travel from 2.8 to 4.1 inches (80 to 105mm) makes it suitable for many riding styles or terrains. Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Fork has large 30mm stanchions to add steering control. U-Turn adjustment changes travel to any setting between 63-108mm with external knob on top of fork. Upper tube has gradients marked for easy reference.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight. Hayes disc brakes are powerful stoppers for better control.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Race wheels use butted spokes and alloy nipples for lower weight. Tubeless-compatible wheel design allows you to choose regular or tubeless tires. Big tire casing floats on soft soil. Large contact patch increases traction.

FIT

Frame	Size	16	17.5	19	21
Rider height	Inches	66.4	69.8	73.3	75.2
	Cm	169	177	186	191
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	75	90	105	105
	Angle	5	5	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	184.0	199.0	219.0	239.0

GEARING

	22	32	44
11	52	76	105
12	48	70	96
14	41	60	82
16	36	52	72
18	32	47	64
21	27	40	55
24	24	35	48
28	21	30	41
32	18	26	36

BIKE WEIGHT (est.)
28.6 lb.
12.98 kg.

Sugar 3+ GS

RIDING STYLE.....Adventure

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS .....Platinum series aluminum
FORK .....RockShox Duke XC, U-Turn adjustable travel (63-108mm), soft springs
80 — *Travel, mm*
451 — *Axle-crown length, mm*
REAR SHOCK .....Fox Float R, air/oil, adjustable rebound
2 — *Stroke*
7.875 — *Length*
22.2mm — *Width*
6mm — *Eyes*
HEADSET .....Alloy aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
27.0 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Comp
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Deore LX RapidFire+
BRAKE LEVERS ....Alloy, direct pull, woman's reach
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore LX
Top pull — *Cable routing*
34.9 mm/ 1 3/8", high clamp only — *Attachment*
RR DERAILLEUR ...Shimano Deore XT SGS
CRANKSET .....Bontrager Race 44/32/22
64/104 — *Bolt hole circle, mm*
BB .....Tru-Vativ, ISIS splined
73 x 113, Splined, ISIS — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

WHEELS .....Bontrager Select ATB, 24° front, 28° rear
541 — *E.R.D., mm*
Velox 19mm — *Rim strip*
TIRES .....IRC Backcountry
26 x 2.25 — *Tire size*
SPOKES .....DT 14/15G butted SS, ProLock alloy nipples
254, Radial — *Front, mm*
268/269, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
31.6 — *Outer diameter, mm*
SADDLE .....Titec Ithys Amore, women's, Cro-Moly rails
BRAKES .....Avid Single Digit 3, linear pull
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
36.4 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (plus seatpost mount), replaceable derailleur hanger

FRAME AND FORK HIGHLIGHTS

Sybil link suspension- adjustable rear wheel travel from 2.8 to 4.1 inches (80 to 105mm) makes it suitable for many riding styles or terrains. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Genesisters geometry is designed for women; long front center plus short stem for stability and enhanced steering response. Fork has large 30mm stanchions to add steering control. U-Turn adjustment changes travel to any setting between 63-108mm with external knob on top of fork. Upper tube has gradients marked for easy reference.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance, with high performance. The Select ATB wheelset uses butted spokes with alloy nipples for low weight. Big tire casing floats on soft soil. Large contact patch increases traction.

FIT

Frame	Size	16	17.5
Rider height	Inches	65.2	67.9
	Cm	166	172
Handlebar	Width, mm	600	600
Stem	Length, mm	75	75
	Angle	5	5
Crank	Length, mm	170	175
Seatpost	Length, mm	300	350
Steerer	Length, mm	179.0	194.0

GEARING

	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)

27.6 lb.
12.53 kg.

Sugar 4+

RIDING STYLE ..... **Adventure**

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS .....Platinum series aluminum
FORK .....Manitou Black Comp, adjustable travel (80-100mm)
80 — *Travel, mm*
450.0 — *Axle-crown length, mm*
REAR SHOCK .....Fox Float, air/oil
2 — *Stroke*
7.875 — *Length*
22.2mm — *Width*
6mm — *Eyes*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Sport
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Deore RapidFire+
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore LX
Top pull — *Cable routing*
34.9 mm/ 1 3/8", high clamp only — *Attachment*
RR DERAILLEUR ...Shimano Deore LX SGS
CRANKSET .....Shimano M440 44/32/22
64/104 — *Bolt hole circle, mm*
BB .....Shimano BB-LP27
73 x 113, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

WHEELS .....Bontrager Superstock, 24° front, 28° rear
542 — *E.R.D., mm*
Velox 19mm — *Rim strip*
TIRES .....IRC Mythos XC
26 x 2.1 — *Tire size*
SPOKES .....DT 14/15G butted stainless (14g rear), ProLock brass nipples
256, Radial — *Front, mm*
267/269, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
31.6 — *Outer diameter, mm*
SADDLE .....Titec Ithys Amore
BRAKES .....Alloy direct pull
PEDALS .....Platform
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral QR
36.4 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, replaceable derailleur hanger

COLORS

Red HT/Silver Metallic • Red decal • Red fork

FIT

Frame	Size	16	17.5	19	21
Rider height	Inches	66.1	70.1	73.3	75.2
	Cm	168	178	186	191
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	75	90	105	105
	Angle	15	15	15	15
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	178.5	193.5	213.5	233.5

FRAME AND FORK HIGHLIGHTS

Sybil link suspension- adjustable rear wheel travel from 2.8 to 4.1 inches (80 to 105mm) makes it suitable for many riding styles or terrains. Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Fork has Reverse Arch and 30.0mm stanchions for stiffness and steering control. Plush coil springs with FFD (Fluid Flow Damping), both with external adjustment. Rapid Travel Adjust from 80 to 100mm. Semi-bath lubrication.

COMPONENTS HIGHLIGHTS

Shimano Deore LX shifting is precise, light weight, and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight. Fox rear shock is built heavy duty but light in weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Superstock wheels use quality DT stainless steel spokes for stronger wheels. Tire has very versatile tread pattern which works great almost anywhere.

GEARING

	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)

28.9 lb.
13.12 kg.

29" HARDTAILS

For 2003

This frame platform was first introduced for the 2002 model year, and remains the same for 2003.

Geometry

The 29er uses Genesis geometry, adapted for the larger wheels.

Ride

The 29er is a great mountain bike for all types of riding, but really excels in soft conditions like sand or mud where its oversized wheels reduce rolling resistance. Lower resistance means either faster speeds, less work, or both. And the float of those big hoops enhances control in the same conditions.

Likewise, the larger wheels make for a smooth ride, which some people compare to suspension...only this is a hardtail, with all the benefits of lower frame weight and no suspension movement.

Frame details

The 29er uses Platinum series ZR9000 aluminum frame technology.

Full 'top tube' cable routing keeps the cables out of the muck for friction free shifting and braking.

Special parts

Disc brake adapter 210648
Seat collar 211488
Derailleur hanger 230026

	Frame sizes	15.5	17.5	19	21
	Head angle	70.5	71.0	71.5	71.5
	Seat angle	74.0	74.0	73.5	73.0
MILLIMETERS	Standover	695	729	757	799
	Seat tube	394	442	479	529
	Head tube	80	80	90	105
	Eff top tube	590	608	628	647
	Chainstays	440	440	440	440
	BB height	292	292	292	297
	Offset	42.0	42.0	42.0	42.0
	Trail	87	83	80	80
	Wheelbase	1081	1094	1103	1119
INCHES	Standover	27.3	28.7	29.8	31.5
	Seat tube	15.5	17.4	18.9	20.8
	Head tube	3.1	3.1	3.5	4.1
	Eff top tube	23.2	23.9	24.7	25.5
	Chainstays	17.3	17.3	17.3	17.3
	BB height	11.5	11.5	11.5	11.7
	Offset	1.7	1.7	1.7	1.7
	Trail	3.4	3.3	3.1	3.1
	Wheelbase	42.6	43.1	43.4	44.1

Supercaliber 29

RIDING STYLE..... Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS .....Platinum series aluminum
FORK .....Marzocchi Marathon SL
80 — *Travel, mm*
479 — *Axle-crown length, mm*
HEADSET .....Cane Creek S-6 Aheadset, alloy
25.4/34.0/30.0 — *Size*
27.1 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Race Lite
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Race Lite
39.5 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Deore XT RapidFire SL
BRAKE LEVERS ....Avid SD-7, long pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore XT
Top pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano XTR SGS
CRANKSET .....Bontrager Race Lite 44/32/22
64/104 — *Bolt bole circle, mm*
BB .....TruVativ, ISI splined
73 x 113, Splined, ISIS — *Shell x axle, mm*
CHAIN .....Shimano HG-72
9 speed — *Chain type*
110 — *Chain length (links)*
CASSETTE .....Shimano Deore XT 11-34, 9spd

WHEELSET

FRONT WHEEL ....Btgr Race Lite ATB 29", disc compatible, 28°
600 — *E.R.D., mm*
Velox 22mm — *Rim strip*
REAR WHEEL .....Btgr Race Lite ATB 29", disc compatible, 28°
603 — *E.R.D., mm*
Velox 22mm — *Rim strip*
FRONT TIRE .....IRC Notos XC, 127tpi, folding
29 x 2.1 — *Tire size*
REAR TIRE .....IRC Notos XC, 127tpi, folding
29 x 2.1 — *Tire size*
SPOKES .....DT 14/15G butted SS, ProLock alloy nipples
298/300, 3x — *Front, mm*
298/297, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Race
31.6 — *Outer diameter, mm*
SADDLE .....Titec Ithys Gove, titanium rails
BRAKES .....Avid SD Ultimate, linear pull
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
36.4 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts

COLORS

Yellow Pearl HT/Prime Blue Mid/Yellow Pearl rear • Yellow decal • Yellow fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. 29" wheels roll over bumps with less effort, making the bike faster. Fork has Doppio air spring with both positive and negative springs. ECC (Extension Control Cartridge) provides 5 position rebound adjustment and lockout.

COMPONENTS HIGHLIGHTS

Shimano XTR and Deore XT shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance, with high performance. The Race Lite wheels use butted spokes and alloy nipples for low weight. The disc-compatible design allows disc brakes to be added without changing hubs. Tires have reduced knob size for low weight, low rolling resistance. High TPI (Threads Per Inch) makes casing light and strong to resist flats, supple to increase traction. Folding beads reduce weight.

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.6	71.2	74.1	75.2
	Cm	174	181	188	191
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	75	90	105	105
	Angle	7	7	7	7
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	330	390	390	390
Steerer	Length, mm	172.6	172.6	182.6	197.6

GEARING

	22	32	44
11	58	84	116
13	49	71	98
15	43	62	85
17	38	55	75
20	32	46	64
23	28	40	55
26	25	36	49
30	21	31	43
34	19	27	38

BIKE WEIGHT (est.)

23.0 lb.
10.44 kg.

X-Caliber 29

RIDING STYLE.....Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES	Platinum series butted ZR9000	
STAYS	Platinum series aluminum	
FORK	Marzocchi MXC Comp 29	
	80	*Travel, mm*
	479	*Axle-crown length, mm*
HEADSET	Aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	26.5	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Select	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Sport	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore RapidFire+	
BRAKE LEVERS	Alloy, direct pull	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8"	*Attachment*
RR DERAILLEUR	Shimano Deore LX SGS	
CRANKSET	Shimano M440 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Shimano BB-LP27	
	73 x 113, Square	*Shell x axle, mm*
CHAIN	Shimano HG-53	
	9 speed	*Chain type*
	110	*Chain length (links)*
CASSETTE	SRAM 7.0 11-34, 9spd	

WHEELSET

FRONT WHEEL	Btgr Superstock ATB 29", disc compatible, 32°	
	604	*E.R.D., mm*
	Velox 22mm	*Rim strip*
REAR WHEEL	Btgr Superstock ATB 29", disc compatible, 32°	
	604	*E.R.D., mm*
	Velox 22mm	*Rim strip*
FRONT TIRE	IRC Mythos XC-II, folding	
	29 x 2.1	*Tire size*
REAR TIRE	IRC Mythos XC-II, folding	
	29 x 2.1	*Tire size*
SPOKES	DT 14g, ProLock brass nipples	
	293/294, 3x	*Front, mm*
	293/294, 3x	*Rear, mm*
INNER TUBES	Presta valve, ultra light	

OTHER

SEATPOST	Bontrager Sport	
	31.6	*Outer diameter, mm*
SADDLE	Titec Ithys Amore	
BRAKES	Alloy direct pull	
PEDALS	Shimano SPD M515, clipless	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral QR	
	36.4	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts, rack mounts	

COLORS

Silver Metallic HT/Red • Silver decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. 29" wheels roll over bumps with less effort, making the bike faster. Fork has air spring and magnesium lowers for low weight. SSV (Speed Sensitive Damping) for smooth feel, increased control over varying bump sizes. 30mm stanchions provide stiffness for steering control.

COMPONENTS HIGHLIGHTS

Shimano Deore LX and Deore shifting is precise, light weight, and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Superstock wheels use quality DT stainless steel spokes for stronger wheels. These hubs are compatible with disc brakes. Tire has very versatile tread pattern which works great almost anywhere. Folding tire beads reduce weight.

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.5	71.3	74.1	75.3
	Cm	174	181	188	191
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	75	90	105	105
	Angle	15	15	15	15
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	173.5	173.5	183.5	198.5

GEARING

	22	32	44
11	58	84	116
13	49	71	98
15	43	62	85
17	38	55	75
20	32	46	64
23	28	40	55
26	25	36	49
30	21	31	43
34	19	27	38

BIKE WEIGHT (est.)

25.1 lb.
11.40 kg.

Paragon 29

RIDING STYLE..... Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES	Platinum series butted ZR9000	
STAYS	Platinum series aluminum	
FORK	Marzocchi MXC Comp ETA 29	
	80	*Travel, mm*
	479	*Axle-crown length, mm*
HEADSET	Aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	26.5	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Select	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Comp	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore LX RapidFire+	
BRAKE LEVERS	Avid SD-5, long pull	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore LX	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8"	*Attachment*
RR DERAILLEUR	Shimano Deore XT SGS	
CRANKSET	Bontrager Race 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Tru-Vativ, ISIS splined	
	73 x 113, Splined, ISIS	*Shell x axle, mm*
CHAIN	Shimano HG-53	
	9 speed	*Chain type*
	110	*Chain length (links)*
CASSETTE	SRAM 7.0 11-34, 9spd	

WHEELSET

FRONT WHEEL	Bontrager Race ATB 29", disc compatible, 28°	
	603	*E.R.D., mm*
	Velox 22mm	*Rim strip*
REAR WHEEL	Bontrager Race ATB 29", disc compatible, 28°	
	603	*E.R.D., mm*
	Velox 22mm	*Rim strip*
FRONT TIRE	IRC Mythos XC-II, folding	
	29 x 2.1	*Tire size*
REAR TIRE	IRC Mythos XC-II, folding	
	29 x 2.1	*Tire size*
SPOKES	DT 14/15G butted SS, ProLock alloy nipples	
	297/299, 3x	*Front, mm*
	297/298, 3x	*Rear, mm*
INNER TUBES	Presta valve, ultra light	

OTHER

SEATPOST	Bontrager Sport	
	31.6	*Outer diameter, mm*
SADDLE	Titec Ithys Amore	
BRAKES	Avid Single Digit 3, linear pull	
PEDALS	Shimano SPD M515, clipless	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral bolt	
	36.4	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts, rack mounts	

COLORS

Black HT/Blue Metallic • Silver decal • Black fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. 29" wheels roll over bumps with less effort, making the bike faster. Fork has air spring and magnesium lowers for low weight. SSV (Speed Sensitive Damping) for smooth feel, increased control over varying bump sizes. 30mm stanchions provide stiffness for steering control. External travel adjust changes ride height, ideal to set up for climbing vs. descending.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Race wheels use butted spokes and alloy nipples for lower weight. Disc-compatible hubs allow addition of disc brakes without rebuilding the wheels. Tire has very versatile tread pattern which works great almost anywhere. Folding tire beads reduce weight.

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.6	71.1	73.9	75.4
	Cm	174	181	188	192
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	75	90	105	105
	Angle	5	5	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	173.5	173.5	183.5	198.5

GEARING

	22	32	44
11	58	84	116
13	49	71	98
15	43	62	85
17	38	55	75
20	32	46	64
23	28	40	55
26	25	36	49
30	21	31	43
34	19	27	38

BIKE WEIGHT (est.)

25.1 lb.
11.40 kg.

Mt. Tam. 29

RIDING STYLE..... Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES	Platinum series butted ZR9000	
STAYS	Platinum series aluminum	
FORK	Marzocchi MX Pro ETA 29	
	80	*Travel, mm*
	479	*Axle-crown length, mm*
HEADSET	Alloy aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	27.0	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Race	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Race	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore XT RapidFire SL	
BRAKE LEVERS	Avid SD-7, long pull	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore XT	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8"	*Attachment*
RR DERAILLEUR	Shimano XTR SGS	
CRANKSET	Bontrager Race 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Tru-Vativ, ISIS splined	
	73 x 113, Splined, ISIS	*Shell x axle, mm*
CHAIN	Shimano HG-72	
	9 speed	*Chain type*
	110	*Chain length (links)*
CASSETTE	Shimano HG70 11-32, 9spd	

WHEELSET

FRONT WHEEL	Bontrager Race ATB 29", disc compatible, 28°	
	600	*E.R.D., mm*
	Velox 22mm	*Rim strip*
REAR WHEEL	Bontrager Race ATB 29", disc compatible, 28°	
	603	*E.R.D., mm*
	Velox 22mm	*Rim strip*
FRONT TIRE	IRC Notos XC, 127tpi, folding	
	29 x 2.1	*Tire size*
REAR TIRE	IRC Notos XC, 127tpi, folding	
	29 x 2.1	*Tire size*
SPOKES	DT 14/15G butted stainless, alloy nipples	
	297/299, 3x	*Front, mm*
	297/298, 3x	*Rear, mm*
INNER TUBES	Presta valve	

OTHER

SEATPOST	Bontrager Race	
	31.6	*Outer diameter, mm*
SADDLE	Titec Ithys Amore	
BRAKES	Avid Single Digit 5, linear pull	
PEDALS	Shimano SPD M515, clipless	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral bolt	
	36.4	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts, rack mounts	

COLORS

Red HT/Silver • Black decal • Red fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. 29" wheels roll over bumps with less effort, making the bike faster. Fork has air spring and magnesium lowers for low weight. SSV (Speed Sensitive Damping) for smooth feel, increased control over varying bump sizes. 30mm stanchions provide stiffness for steering control. External travel adjust changes ride height, ideal to set up for climbing vs. descending. External preload and rebound adjustment for easy tuning.

COMPONENTS HIGHLIGHTS

Shimano XTR and Deore XT shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Race wheels use butted spokes and alloy nipples for lower weight. Disc-compatible hubs allow addition of disc brakes without rebuilding the wheels. Tires have reduced knob size for low weight, low rolling resistance. High TPI (Threads Per Inch) makes casing light and strong to resist flats, supple to increase traction. Folding beads reduce weight.

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.0	71.4	73.5	75.8
	Cm	173	181	187	193
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	70	90	100	110
	Angle	10	10	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	330	390	390	390
Steerer	Length, mm	174.0	174.0	184.0	199.0

GEARING

	22	32	44
11	58	84	116
12	53	77	106
14	46	66	91
16	40	58	80
18	35	52	71
21	30	44	61
24	27	39	53
28	23	33	46
32	20	29	40

BIKE WEIGHT (est.)

25.1 lb.
11.40 kg.

GENESIS HARDTAILS

For 2003

The Genesis hardtails were introduced in the 1998 model year. The geometry remained unchanged for 2002, but a new frame material on the Platinum series, called ZR9000, makes the new frames lighter and at the same time, stronger. This frame platform remains unchanged from last year.

Geometry

The regular Genesis hardtails hardtail uses Gary Fisher's race-proven Genesis Geometry.

The Genesisters bikes use these same concepts, but adapted to fit and perform for a woman. The handlebar position, through frame and specs, reduce the stress on a woman's back when riding. The position balances her weight over the bottom bracket so she gets the most pedal power possible, and over the wheels for optimum handling. This is complimented by smart specs for an overall ergonomic fit for a woman.

Ride

The Genesis hardtail frame is one of the lightest racing hardtails ever produced. Of the bikes that can compete with this frame in weight, only the Fisher frame has Genesis geometry.

With their oversize aluminum tubes, high lateral frame rigidity and super-short chainstays, Genesis hardtails provide amazing rear wheel traction.

The Genesis geometry makes these bikes super handling, especially at racing speeds.

Frame details

The Genesis hardtails use our Platinum and Gold series frame technology. The head tube, is double butted to reduce weight and support the headset cups.

Full top tube cable routing with 'bullet' stops keeps the cables out of the muck for friction free shifting and braking. The bullet stops have a smooth junction with the frame, and rounded corners, so prevent things (like your clothes) from snagging.

The dropouts, brake yoke, and other details on the Genesis hardtails are forged aluminum. Forging provides the highest structural integrity, while the low density of the aluminum keeps the bike light.

The Genesis hardtail frame uses a special dropout to accommodate a disc brake adapter. This adapter provides mounting for an International style rear disc brake.

Genesis hardtail frames have 3 water bottle mounts.

Genesis hardtails

	Frame sizes	13	15.5	17.5	19	21
	Head angle	70.5	71.0	71.5	71.5	71.5
	Seat angle	74.5	74.0	74.0	73.5	73.0
MILLIMETERS	Standover	692	725	756	783	818
	Seat tube	332	396	446	484	535
	Head tube	90	90	105	125	145
	Eff top tube	552	582	608	628	647
	Chainstays	413	413	413	413	413
	BB height	287	292	292	292	297
	Offset	41.9	41.9	41.9	41.9	41.9
	Trail	74	71	68	68	68
	Wheelbase	1031	1053	1075	1091	1107
INCHES	Standover	27.2	28.5	29.8	30.8	32.2
	Seat tube	13.1	15.6	17.6	19.1	21.1
	Head tube	3.5	3.5	4.1	4.9	5.7
	Eff top tube	21.7	22.9	23.9	24.7	25.5
	Chainstays	16.3	16.3	16.3	16.3	16.3
	BB height	11.3	11.5	11.5	11.5	11.7
	Offset	1.6	1.6	1.6	1.6	1.6
	Trail	2.9	2.8	2.7	2.7	2.7
	Wheelbase	40.6	41.4	42.3	42.9	43.6

Genesisters hardtails

	Frame sizes	13	15.5	17.5
	Head angle	70.5	70.5	71.0
	Seat angle	74.5	74.0	74.0
MILLIMETERS	Standover	654	696	733
	Seat tube	332	396	446
	Head tube	90	90	105
	Eff top tube	552	567	595
	Chainstays	413	413	413
	BB height	287	292	292
	Offset	41.9	41.9	41.9
	Trail	74	74	71
	Wheelbase	1031	1042	1066
INCHES	Standover	25.7	27.4	28.9
	Seat tube	13.1	15.6	17.6
	Head tube	3.5	3.5	4.1
	Eff top tube	21.7	22.3	23.4
	Chainstays	16.3	16.3	16.3
	BB height	11.3	11.5	11.5
	Offset	1.6	1.6	1.6
	Trail	2.9	2.9	2.8
	Wheelbase	40.6	41.0	42.0

Special parts

Disc brake adapter 210648
Seat collar 211488
Derailleur hanger 230026

Big Sur

RIDING STYLE..... Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS .....Platinum series aluminum
3.5 lb. (1.59 kg.) — Frame weight (estimated)
FORK .....RockShox Duke XC, U-Turn adjustable travel (63-108mm)
80 — Travel, mm
451 — Axle-crown length, mm
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — Size
26.5 — Stack height, mm

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — Clamp diameter, mm
STEM .....Bontrager Select
41.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Deore LX RapidFire+
BRAKE LEVERS ....Avid AD 3L, long pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore
Top pull — Cable routing
34.9 mm/ 1 3/8" — Attachment
RR DERAILLEUR ...Shimano Deore XT SGS
CRANKSET .....Bontrager Race 44/32/22
64/104 — Bolt hole circle, mm
BB .....Tru-Vativ, ISIS splined
73 x 113, Splined, ISIS — Shell x axle, mm
CHAIN .....Shimano HG-53
9 speed — Chain type
106 — Chain length (links)
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Superstock, 24°
542 — E.R.D., mm
Velox 19mm — Rim strip
REAR WHEEL .....Bontrager Superstock, 28°
542 — E.R.D., mm
Velox 22mm — Rim strip
FRONT TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
REAR TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
SPOKES .....DT 14g, ProLock brass nipples
256, Radial — Front, mm
267/269, 3x — Rear, mm
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
31.6 — Outer diameter, mm
SADDLE .....Titec Ithys Amore
BRAKES .....Shimano M420, V type
PEDALS .....Shimano SPD M515, clipless
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral QR
36.4 — Inner diameter, mm
ADDITIONALS .....3 water bottle mounts, replaceable derailleur hanger

COLORS

Red HT/Black Metallic • Red decal • Red fork

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.6	71.9	75.0	76.5
	Cm	174	183	191	194
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	75	90	105	105
	Angle	5	5	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	183.5	198.5	218.5	238.5

FRAME AND FORK HIGHLIGHTS

Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Fork has large 30mm stanchions to add steering control. U-Turn adjustment changes travel to any setting between 63-108mm with external knob on top of fork. Upper tube has gradients marked for easy reference.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Superstock wheels use quality DT stainless steel spokes for stronger wheels. Tire has very versatile tread pattern which works great almost anywhere.

GEARING

	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)

26.7 lb.
12.12 kg.

Big Sur Disc

RIDING STYLE.....Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS .....Platinum series aluminum
3.5 lb. (1.59 kg.) — Frame weight (estimated)
FORK .....RockShox Duke XC, U-Turn adjustable travel (63-108mm)
80 — Travel, mm
451 — Axle-crown length, mm
HEADSET .....Alloy aheadset, semi-cartridge
25.4/34.0/30.0 — Size
26.5 — Stack height, mm

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — Clamp diameter, mm
STEM .....Bontrager Select
41.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Deore LX RapidFire+
BRAKE LEVERS ....Hydraulic, attached to brake
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore
Top pull — Cable routing
34.9 mm/ 1 3/8" — Attachment
RR DERAILLEUR ...Shimano Deore XT SGS
CRANKSET .....Bontrager Race 44/32/22
64/104 — Bolt hole circle, mm
BB .....Tru-Vativ, ISIS splined
73 x 113, Splined, ISIS — Shell x axle, mm
CHAIN .....Shimano HG-53
9 speed — Chain type
106 — Chain length (links)
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Superstock Disc, 28°
542 — E.R.D., mm
Velox 22mm — Rim strip
REAR WHEEL .....Bontrager Superstock Disc, 28°
542 — E.R.D., mm
Velox 22mm — Rim strip
FRONT TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
REAR TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
SPOKES .....DT 14g, ProLock brass nipples
267, 3x — Front, mm
267/267, 3x — Rear, mm
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
31.6 — Outer diameter, mm
SADDLE .....Titec Ithys Amore
BRAKES .....Hayes HFX-9, hydraulic disc
PEDALS .....Shimano SPD M515, clipless
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral QR
36.4 — Inner diameter, mm
ADDITIONALS .....3 water bottle mounts, replaceable derailleur hanger

COLORS

Red HT/Black Metallic • Red decal • Red fork

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.6	71.9	75.0	76.5
	Cm	174	183	191	194
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	75	90	105	105
	Angle	5	5	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	175.2	190.2	210.2	230.2

FRAME AND FORK HIGHLIGHTS

Genesis geometry is defined by long front center plus short stem for stability and enhanced steering response. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Fork has large 30mm stanchions to add steering control. U-Turn adjustment changes travel to any setting between 63-108mm with external knob on top of fork. Upper tube has gradients marked for easy reference.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager cranks, bars, stem, and seatpost are engineered to be strong, yet light weight. Hayes disc brakes provide powerful, easily modulated stopping.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Superstock wheels use quality DT stainless steel spokes for stronger wheels. These hubs are compatible with disc brakes. Tire has very versatile tread pattern which works great almost anywhere.

GEARING

	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)

27.1 lb.
12.30 kg.

Big Sur GS

RIDING STYLE..... Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES ..... Platinum series butted ZR9000
STAYS ..... Platinum series aluminum
3.5 lb. (1.59 kg.) — Frame weight (estimated)
FORK ..... RockShox Duke XC, U-Turn, light springs
80 — Travel, mm
451 — Axle-crown length, mm
HEADSET ..... Aheadset, semi-cartridge
25.4/34.0/30.0 — Size
26.5 — Stack height, mm

CONTROLS

HANDLEBAR ..... Bontrager Select
25.4 — Clamp diameter, mm
STEM ..... Bontrager Select
41.0 — Steerer clamp height, mm
SHIFT LEVERS ..... Shimano Deore LX RapidFire+
BRAKE LEVERS .... Alloy, direct pull, woman's reach
GRIPS ..... Serfas dual density

DRIVETRAIN

FT DERAILLEUR ... Shimano Deore
Top pull — Cable routing
34.9 mm/ 1 3/8" — Attachment
RR DERAILLEUR ... Shimano Deore XT SGS
CRANKSET ..... Bontrager Race 44/32/22
64/104 — Bolt hole circle, mm
BB ..... Tru-Vativ, ISIS splined
73 x 113, Splined, ISIS — Shell x axle, mm
CHAIN ..... Shimano HG-53
9 speed — Chain type
106 — Chain length (links)
CASSETTE ..... SRAM 7.0 11-34, 9spd

WHEELSET

FRONT WHEEL .... Bontrager Superstock, 24°
542 — E.R.D., mm
Velox 19mm — Rim strip
REAR WHEEL ..... Bontrager Superstock, 28°
542 — E.R.D., mm
Velox 22mm — Rim strip
FRONT TIRE ..... IRC Mythos XC
26 x 2.1 — Tire size
REAR TIRE ..... IRC Mythos XC
26 x 2.1 — Tire size
SPOKES ..... DT 14g, ProLock brass nipples
256, Radial — Front, mm
267/269, 3x — Rear, mm
INNER TUBES ..... Presta valve

OTHER

SEATPOST ..... Bontrager Sport
31.6 — Outer diameter, mm
SADDLE ..... Titec Ithys Nixi, women's
BRAKES ..... Shimano M420, V type
PEDALS ..... Shimano SPD M515, clipless
9/16" — Axle diameter
SEAT BINDER ..... Alloy w/integral QR
36.4 — Inner diameter, mm
ADDITIONALS ..... 3 water bottle mounts (2 on 13), replaceable derailleur hanger

COLORS

Black HT/Light Blue Metallic • White decal • Black fork

FIT

Frame	Size	13	15.5	17.5
Rider height	Inches	64.3	66.1	68.4
	Cm	163	168	174
Handlebar	Width, mm	600	600	600
Stem	Length, mm	60	75	75
	Angle	5	5	5
Crank	Length, mm	170	170	175
Seatpost	Length, mm	300	300	350
Steerer	Length, mm	183.5	183.5	198.5

FRAME AND FORK HIGHLIGHTS

ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Genesisters geometry is designed for women; long front center plus short stem for stability and enhanced steering response. Fork has large 30mm stanchions to add steering control.

COMPONENTS HIGHLIGHTS

Shimano Deore XT and LX shifting is precise, light weight, and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight. Shimano clipless pedals are secure, easy to use.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. The Superstock wheels use quality DT stainless steel spokes for stronger wheels. Tire has very versatile tread pattern which works great almost anywhere.

GEARING

	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)

26.2 lb.
11.89 kg.

Hoo Koo E Koo

RIDING STYLE.....Everyday Enthusiast or Racer

FRAMESET

MAIN TUBES .....Gold series 6061 T6 aluminum
STAYS .....Gold series 6061 T6 aluminum
3.5 lb. (1.59 kg.) — Frame weight (estimated)
FORK .....Manitou Axel Super
80 — Travel, mm
450.0 — Axle-crown length, mm
HEADSET .....Alloy aheadset, semi-cartridge
25.4/34.0/30.0 — Size
26.5 — Stack height, mm

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — Clamp diameter, mm
STEM .....Bontrager Sport
41.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Deore RapidFire+
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore
Top pull — Cable routing
34.9 mm/ 1 3/8" — Attachment
RR DERAILLEUR ...Shimano Deore LX SGS
CRANKSET .....Shimano M440 44/32/22
64/104 — Bolt hole circle, mm
BB .....Shimano BB-LP27
73 x 113, Square — Shell x axle, mm
CHAIN .....Shimano HG-53
9 speed — Chain type
106 — Chain length (links)
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Bontrager Corvair rim
542 — E.R.D., mm
Velox 19mm — Rim strip
REAR WHEEL .....Shimano M470 hub, 32°, Bontrager Corvair OSB rim
542 — E.R.D., mm
Velox 22mm — Rim strip
FRONT TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
REAR TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
SPOKES .....14G stainless
266, 3x — Front, mm
263/265, 3x — Rear, mm
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
31.6 — Outer diameter, mm
SADDLE .....Titec Ithys Amore
BRAKES .....Alloy direct pull
PEDALS .....Shimano SPD M515, clipless
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral QR
36.4 — Inner diameter, mm
ADDITIONALS .....3 water bottle mounts (2 on 13), replaceable derailleur hanger

COLORS

Candy Blue HT/Silver Metallic • Gold decal • Candy Blue fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry means long front center plus short stem for stability and enhanced steering response. Gold series 6061 T6 aluminum for high elasticity resulting in low weight.
Fork has Reverse Arch and 28.6mm stanchions for stiffness and steering control. Plush coil springs with FFD (Fluid Flow Damping), both with external adjustment. Alloy steerer reduces weight. Convertible travel from 80 to 100mm.

COMPONENTS HIGHLIGHTS

Shimano Deore LX and Deore shifting is precise, light weight, and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight. Shimano clipless pedals are secure, easy to use.

WHEELSET HIGHLIGHTS

Bontrager Corvair and Corvair OSB rims are strong and light. The welded rim joint is very strong, and machined for smooth braking action. The OSB (Offset Spoke Bed) rear rim reduces dish for a stronger rear wheel. Tire has very versatile tread pattern which works great almost anywhere.

FIT

Frame	Size	13	15.5	17.5	19	21
Rider height	Inches	65.1	68.3	72.1	75.0	76.4
	Cm	165	173	183	191	194
Handlebar	Width, mm	620	620	620	620	620
Stem	Length, mm	60	75	90	105	105
	Angle	15	15	15	15	15
Crank	Length, mm	170	170	175	175	175
Seatpost	Length, mm	300	300	350	350	350
Steerer	Length, mm	178.5	178.5	193.5	213.5	233.5

GEARING

	22	32	44
11	52	76	105
13	44	65	89
15	38	56	77
17	34	49	68
20	29	42	58
23	25	36	50
26	22	32	44
30	19	28	38
34	17	25	34

BIKE WEIGHT (est.)

27.1 lb.
12.30 kg.

Tassajara

RIDING STYLE Everyday Enthusiast or Aggressive Newbie

FRAMESET

MAIN TUBES ..... Silver series 7005 aluminum
STAYS ..... Silver series 7005 aluminum
3.9 lb. (1.77 kg.) — *Frame weight (estimated)*
FORK ..... RockShox Pilot XC
80 — *Travel, mm*
451 — *Axle-crown length, mm*
HEADSET ..... Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR ..... Bontrager Crowbar Sport
25.4 — *Clamp diameter, mm*
STEM ..... Bontrager Sport
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS ..... Shimano Deore RapidFire+
BRAKE LEVERS .... Alloy, direct pull
GRIPS ..... Serfas dual density

DRIVETRAIN

FT DERAILLEUR ... Shimano Deore
Top pull — *Cable routing*
Plate style w/34.9mm clamp — *Attachment*
RR DERAILLEUR ... Shimano Deore SGS
CRANKSET ..... Shimano M440 44/32/22
64/104 — *Bolt hole circle, mm*
BB ..... Shimano BB-LP27
73 x 113, Square — *Shell x axle, mm*
CHAIN ..... Shimano HG-53
9 speed — *Chain type*
106 — *Chain length (links)*
CASSETTE ..... SRAM 7.0 11-32, 9spd

WHEELSET

FRONT WHEEL .... Alloy, QR hub, 32°, Bontrager Corvair rim
542 — *E.R.D., mm*
Velox 19mm — *Rim strip*
REAR WHEEL ..... Shimano M470 hub, 32°, Bontrager Corvair OSB rim
542 — *E.R.D., mm*
Velox 22mm — *Rim strip*
FRONT TIRE ..... IRC Mythos XC
26 x 2.1 — *Tire size*
REAR TIRE ..... IRC Mythos XC
26 x 2.1 — *Tire size*
SPOKES ..... 14G stainless
266, 3x — *Front, mm*
263/265, 3x — *Rear, mm*
INNER TUBES ..... Presta valve

OTHER

SEATPOST ..... Bontrager Sport
29.2 — *Outer diameter, mm*
SADDLE ..... Titec Ithys Amore
BRAKES ..... Alloy direct pull
PEDALS ..... Alloy platform
9/16" — *Axle diameter*
SEAT BINDER ..... Alloy w/integral QR
34.9 — *Inner diameter, mm*
ADDITIONALS ..... 2 water bottle mounts (1 on XS), rack mounts

COLORS

Red HT/Blue Metallic • Yellow decal • Red fork
Red HT/Bronze Metallic • Silver decal • Red fork

FIT

Frame	Size	13	15.5	17.5	19	21
Rider height	Inches	65.2	68.4	72.2	75.1	76.5
	Cm	166	174	183	191	194
Handlebar	Width, mm	620	620	620	620	620
Stem	Length, mm	60	75	90	105	105
	Angle	15	15	15	15	15
Crank	Length, mm	170	170	175	175	175
Seatpost	Length, mm	300	300	350	350	350
Steerer	Length, mm	178.5	178.5	193.5	213.5	233.5

FRAME AND FORK HIGHLIGHTS

Genesis geometry gives long front center plus short stem for stability and enhanced steering response. Silver series 7005 aluminum means low weight, high strength. Fork uses coil spring with air assist for wide adjustment range and plush action. New HC2 damping has wider adjustment range. Magnesium lowers are light and stiff. All Travel provides adjustment from 80 to 100mm travel.

COMPONENTS HIGHLIGHTS

Shimano Deore shifting is offers 9 speed shifting that is precise and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Corvair and Corvair OSB rims are strong and light. The welded rim joint is very strong, and machined for smooth braking action. The OSB (Offset Spoke Bed) rear rim reduces dish for a stronger rear wheel. Tire has very versatile tread pattern which works great almost anywhere.

GEARING

	22	32	44
11	52	76	105
12	48	70	96
14	41	60	82
16	36	52	72
18	32	47	64
21	27	40	55
24	24	35	48
28	21	30	41
32	18	26	36

BIKE WEIGHT (est.)

28.0 lb.
12.71 kg.

Tassajara Disc

RIDING STYLE Everyday Enthusiast or Aggressive Newbie

FRAMESET

MAIN TUBES	Silver series 7005 aluminum	
STAYS	Silver series 7005 aluminum	
	3.9 lb. (1.77 kg.)	*Frame weight (estimated)*
FORK	RockShox Pilot XC	
	80	*Travel, mm*
	451	*Axle-crown length, mm*
HEADSET	Aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	26.5	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Crowbar Sport	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Sport	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore RapidFire+	
BRAKE LEVERS	Alloy, direct pull	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8"	*Attachment*
RR DERAILLEUR	Shimano Deore SGS	
CRANKSET	Shimano M440 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Shimano BB-LP27	
	73 x 113, Square	*Shell x axle, mm*
CHAIN	Shimano HG-53	
	3/32"	*Chain type*
	106	*Chain length (links)*
CASSETTE	SRAM 7.0 11-32, 9spd	

WHEELSET

FRONT WHEEL	Alloy, disc compatible, QR hub, 32°, Bontrager Corvair OSB rim	
	542	*E.R.D., mm*
	Velox 22mm	*Rim strip*
REAR WHEEL	Alloy, disc compatible, QR hub, 32°, Bontrager Corvair OSB rim	
	542	*E.R.D., mm*
	Velox 22mm	*Rim strip*
FRONT TIRE	IRC Mythos XC	
	26 x 2.1	*Tire size*
REAR TIRE	IRC Mythos XC	
	26 x 2.1	*Tire size*
SPOKES	14G stainless	
	262, 3x	*Front, mm*
	262/262, 3x	*Rear, mm*
INNER TUBES	Presta valve	

OTHER

SEATPOST	Bontrager Sport	
	29.2	*Outer diameter, mm*
SADDLE	Titec Ithys Amore	
BRAKES	Hayes HFX-1 disc, mechanical	
PEDALS	Alloy platform	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral QR	
	34.9	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts, rack mounts	

COLORS

Red HT/Bronze Metallic • Silver decal • Red fork

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.4	72.2	75.1	76.8
	Cm	174	183	191	195
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	75	90	105	105
	Angle	15	15	15	15
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	178.5	193.5	213.5	233.5

FRAME AND FORK HIGHLIGHTS

Genesis geometry gives long front center plus short stem for stability and enhanced steering response. Silver series 7005 aluminum means low weight, high strength. Fork uses coil spring with air assist for wide adjustment range and plush action. New HC2 damping has wider adjustment range. Magnesium lowers are light and stiff. All Travel provides adjustment from 80 to 100mm travel.

COMPONENTS HIGHLIGHTS

Shimano Deore shifting is offers 9 speed shifting that is precise and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight. Hayes disc brakes mean superior speed control.

WHEELSET HIGHLIGHTS

Bontrager Corvair and Corvair OSB rims are strong and light. The welded rim joint is very strong, and machined for smooth braking action. The OSB (Offset Spoke Bed) rear rim reduces dish for a stronger rear wheel. Tire has very versatile tread pattern which works great almost anywhere.

GEARING

	22	32	44
11	52	76	105
12	48	70	96
14	41	60	82
16	36	52	72
18	32	47	64
21	27	40	55
24	24	35	48
28	21	30	41
32	18	26	36

BIKE WEIGHT (est.)

30.0 lb.
13.62 kg.

Tassajara GS

RIDING STYLE . Woman Enthusiast or Aggressive Newbie

FRAMESET

MAIN TUBES	Silver series aluminum	
STAYS	Silver series aluminum	
	3.5 lb. (1.59 kg.)	*Frame weight (estimated)*
FORK	RockShox Pilot XC, light springs	
	80	*Travel, mm*
	451	*Axle-crown length, mm*
HEADSET	Aheadset, semi-cartridge	
	25.4/34.0/30.0	*Size*
	26.5	*Stack height, mm*

CONTROLS

HANDLEBAR	Bontrager Crowbar Sport	
	25.4	*Clamp diameter, mm*
STEM	Bontrager Sport	
	41.0	*Steerer clamp height, mm*
SHIFT LEVERS	Shimano Deore RapidFire+	
BRAKE LEVERS	Alloy, direct pull	
GRIPS	Serfas dual density	

DRIVETRAIN

FT DERAILLEUR	Shimano Deore	
	Top pull	*Cable routing*
	34.9 mm/ 1 3/8"	*Attachment*
RR DERAILLEUR	Shimano Deore SGS	
CRANKSET	Shimano M440 44/32/22	
	64/104	*Bolt hole circle, mm*
BB	Shimano BB-LP27	
	73 x 113, Square	*Shell x axle, mm*
CHAIN	Shimano HG-53	
	9 speed	*Chain type*
	106	*Chain length (links)*
CASSETTE	SRAM 7.0 11-34, 9spd	

WHEELSET

FRONT WHEEL	Alloy, QR hub, 32°, Bontrager Corvair rim	
	542	*E.R.D., mm*
	Velox 19mm	*Rim strip*
REAR WHEEL	Shimano M470 hub, 32°, Bontrager Corvair OSB rim	
	542	*E.R.D., mm*
	Velox 22mm	*Rim strip*
FRONT TIRE	IRC Mythos XC	
	26 x 2.1	*Tire size*
REAR TIRE	IRC Mythos XC	
	26 x 2.1	*Tire size*
SPOKES	14G stainless	
	266, 3x	*Front, mm*
	263/265, 3x	*Rear, mm*
INNER TUBES	Presta valve	

OTHER

SEATPOST	Bontrager Sport	
	29.2	*Outer diameter, mm*
SADDLE	Titec Ithys Nixi, women's	
BRAKES	Alloy direct pull	
PEDALS	Alloy platform	
	9/16"	*Axle diameter*
SEAT BINDER	Alloy w/integral bolt	
	35.0	*Inner diameter, mm*
ADDITIONALS	2 water bottle mounts, replaceable derailleur hanger	

COLORS

Silver Metallic HT/Light Blue Metallic • White decal • Silver fork

FIT

Frame	Size	13	15.5	17.5
Rider height	Inches	65.2	67.4	69.8
	Cm	166	171	177
Handlebar	Width, mm	600	600	600
Stem	Length, mm	60	75	75
	Angle	15	15	15
Crank	Length, mm	170	175	175
Seatpost	Length, mm	300	300	350
Steerer	Length, mm	178.5	178.5	193.5

FRAME AND FORK HIGHLIGHTS

Genesisters geometry is designed for women, long front center plus short stem for stability and enhanced steering response. Silver series 7005 aluminum means low weight, high strength. Fork uses coil spring with air assist for wide adjustment range and plush action. New HC2 damping has wider adjustment range. Magnesium lowers are light and stiff. All Travel provides adjustment from 80 to 100mm travel.

COMPONENTS HIGHLIGHTS

Shimano Deore shifting is offers 9 speed shifting that is precise and durable. Bontrager bars, stem, and seatpost are engineered to be strong, yet light weight. Women's design includes user friendly pedals, shorter cranks, (comparably) wide bars for control, and comfy saddle.

WHEELSET HIGHLIGHTS

Bontrager Corvair and Corvair OSB rims are strong and light. The welded rim joint is very strong, and machined for smooth braking action. The OSB (Offset Spoke Bed) rear rim reduces dish for a stronger rear wheel. Tire has very versatile tread pattern which works great almost any-

GEARING

	22	32	44
11	52	76	105
12	48	70	96
14	41	60	82
16	36	52	72
18	32	47	64
21	27	40	55
24	24	35	48
28	21	30	41
32	18	26	36

BIKE WEIGHT (est.)

27.7 lb.
12.58 kg.

Marlin

RIDING STYLE Everyday Enthusiast or Aggressive Newbie

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
3.9 lb. (1.77 kg.) — Frame weight (estimated)
FORK .....Manitou Six Sport
80 — Travel, mm
450.0 — Axle-crown length, mm
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — Size
26.5 — Stack height, mm

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — Clamp diameter, mm
STEM .....Bontrager Sport
41.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Alivio RapidFire+
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Alivio
Top pull — Cable routing
Plate style w/34.9mm clamp — Attachment
RR DERAILLEUR ...Shimano Deore SGS
CRANKSET .....Shimano M340 42/32/22
64/104 — Bolt hole circle, mm
BB .....Shimano BB-LP27
73 x 113, Square — Shell x axle, mm
CHAIN IG-31
3/32" — Chain type
106 — Chain length (links)
CASSETTE .....SRAM 5.0 11-32, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Bontrager Corvair rim
542 — E.R.D., mm
Velox 19mm — Rim strip
REAR WHEEL .....Shimano RM40 hub, 32°, Bontrager Corvair rim
542 — E.R.D., mm
Velox 19mm — Rim strip
FRONT TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
REAR TIRE .....IRC Mythos XC
26 x 2.1 — Tire size
SPOKES .....14G stainless
266, 3x — Front, mm
263/265, 3x — Rear, mm
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
29.2 — Outer diameter, mm
SADDLE .....Fisher ATB
BRAKES .....Alloy direct pull
PEDALS .....Alloy platform
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral QR
34.9 — Inner diameter, mm
ADDITIONALS .....2 water bottle mounts (1 on 13), rack mounts

COLORS

Black HT/Slate Blue Metallic • White decal • Black fork
Black HT/Yellow Metallic • Blue decal • Yellow fork

FIT

Frame	Size	13	15.5	17.5	19	21
Rider height	Inches	65.2	68.3	72.1	75.0	76.4
	Cm	166	174	183	191	194
Handlebar	Width, mm	620	620	620	620	620
Stem	Length, mm	60	75	90	105	105
	Angle	15	15	15	15	15
Crank	Length, mm	170	170	175	175	175
Seatpost	Length, mm	300	300	350	350	350
Steerer	Length, mm	178.5	178.5	193.5	213.5	233.5

FRAME AND FORK HIGHLIGHTS

Genesis geometry gives long front center plus short stem for stability and enhanced steering response. Silver series 7005 aluminum means low weight, high strength. Fork has Reverse Arch and 28.6mm stanchions for stiffness and steering control. Plush coil springs with external preload adjuster. Convertible travel from 80 to 100mm.

COMPONENTS HIGHLIGHTS

Shimano Alivio with Deore rear derailleur means dependable shifting with easy low-gear climbing. Bontrager Crowbar is a riser for comfort, wide for control. Special attention to comfort points provides user friendly pedals, wide bars for control, and comfy saddle.

WHEELSET HIGHLIGHTS

Bontrager Corvair and Corvair OSB rims are strong and light. The welded rim joint is very strong, and machined for smooth braking action. Tire has very versatile tread pattern which works great almost anywhere.

GEARING

	22	32	42
11	52	76	100
12	48	70	92
14	41	60	79
16	36	52	69
18	32	47	61
21	27	40	52
26	22	32	42
32	18	26	34

BIKE WEIGHT (est.)

28.5 lb.
12.94 kg.

RECREATIONAL HARDTAILS

For 2003

These hardtails were updated in the 2001 model year. The frame is unchanged.

Geometry

The regular Genesis hardtails uses Gary Fisher's race-proven Genesis Geometry. These bikes use a slightly more recreational version of that race design. The rider sits more upright, and the steering has been tuned to offer increased stability with a little less weight on the front wheel.

Ride

These bikes are stable, yet still plenty nimble for some really fun single-track riding. The most noticeable difference in the ride will be the slightly more comfortable, and less 'committed' riding position. Other than that, they still ride like a Fisher.

	Frame sizes	13	16	18	19.5	21.5	18W
	Head angle	70.5	71.0	71.5	71.5	71.5	71.5
	Seat angle	74.5	74.0	74.0	73.5	73.5	74.0
MILLIMETERS	Standover	646	701	743	772	811	
	Seat tube	324	401	451	490	540	451
	Head tube	105	125	145	165	185	165
	Eff top tube	545	568	586	604	622	585
	Chainstays	415	415	415	415	415	415
	BB height	288	291	295	295	295	295
	Offset	38.0	38.0	38.0	38.0	38.0	38.0
	Trail	79	75	72	72	72	72
	Wheelbase	1022	1037	1053	1067	1085	1053
INCHES	Standover	25.4	27.6	29.3	30.4	31.9	
	Seat tube	12.8	15.8	17.8	19.3	21.3	17.8
	Head tube	4.1	4.9	5.7	6.5	7.3	6.5
	Eff top tube	21.5	22.4	23.1	23.8	24.5	23.0
	Chainstays	16.3	16.3	16.3	16.3	16.3	16.3
	BB height	11.3	11.5	11.6	11.6	11.6	11.6
	Offset	1.5	1.5	1.5	1.5	1.5	1.5
	Trail	3.1	3.0	2.8	2.8	2.8	2.8
	Wheelbase	40.2	40.8	41.5	42.0	42.7	41.5

Frame details

These frames use our Gold or Silver aluminum frame technologies. These frames are very light, with superb ride and handling for the everyday-fun rider.

TheTarpon frames use our Cro-Moly and Hi-tensile steel technology. Steel is very durable, and has great ride characteristics tuned by 100 years of perfecting.

These frames have 2 water bottle mounts.

Special parts

Disc brake adapter 210648
Seat collar 981630
Derailleur hanger 230026

Advance

RIDING STYLE.....Casual Enthusiast or Newbie

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
FORK .....RST Capa CL
75 — *Travel, mm*
435.0 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel, 30mm rise
25.4 — *Clamp diameter, mm*
STEM .....Alloy Ahead type
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano EF-29
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C051
Top pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Altus GS
CRANKSET .....SR XCC-100 48/38/28
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 124.5, Square — *Shell x axle, mm*
CHAIN .....KMC Z-51
3/32" — *Chain type*
110 — *Chain length (links)*
CASSETTE .....Shimano ZH37 13-34, 7spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 36°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Alloy, QR hub, 36°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Bontrager Connection
26 x 1.95 — *Tire size*
REAR TIRE .....Bontrager Connection
26 x 1.95 — *Tire size*
SPOKES 14G
265, 3x — *Front, mm*
261/262, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Alloy micro-adjust
29.2 — *Outer diameter, mm*
SADDLE .....Fisher Padded
BRAKES .....Alloy direct pull
PEDALS .....Platform
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral QR
34.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 on XS, S), rack mounts

COLORS

Black Metallic HT/Blue Metallic • Silver decal • Black fork
Silver Metallic HT/Black Metallic • White decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry gives long front center plus short stem for stability and enhanced steering response. Silver series 7005 aluminum means low weight, high strength. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Deluxe recreation level- Shimano Altus rear derailleur shifts 21 speeds to get up the hills, direct pull brakes for control. Platform pedals, wide bars for control, and comfy saddle make cycling fun.

WHEELSET HIGHLIGHTS

Stainless spokes resist corrosion, increase wheel life. Tire has very versatile tread pattern which works great almost anywhere.

FIT

Frame	Size	13	16	18	19.5	21.5	18W
Rider height	Inches	67.6	69.6	73.2	74.8	78.5	73.4
	Cm	172	177	186	190	199	186
Handlebar	Width, mm	600	600	620	620	620	600
Stem	Length, mm	90	90	110	110	130	110
	Angle	25	25	25	25	25	25
Crank	Length, mm	170	170	175	175	175	175
Seatpost	Length, mm	350	350	350	350	350	350
Steerer	Length, mm	207	227	247	267	287	267

GEARING

	24	34	42
11	57	81	100
12	52	74	92
14	45	64	79
16	39	56	69
18	35	50	61
21	30	42	52
26	24	34	42
32	20	28	34

BIKE WEIGHT (est.)

32.1 lb.
14.57 kg.

Wahoo

RIDING STYLE.....Casual Enthusiast or Newbie

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
FORK .....RockShox Judy TT
80 — *Travel, mm*
451.0 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel, 30mm rise
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Sport
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano EF-29
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C050
Top pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Acera-X
CRANKSET .....SR XCC-150 42/34/24
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 124.5, Square — *Shell x axle, mm*
CHAIN IG-31
3/32" — *Chain type*
106 — *Chain length (links)*
CASSETTE .....SRAM 5.0 11-32, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 36°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Shimano RM40 hub, 36°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Bontrager Connection
26 x 1.95 — *Tire size*
REAR TIRE .....Bontrager Connection
26 x 1.95 — *Tire size*
SPOKES .....14G stainless
265, 3x — *Front, mm*
261/262, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Alloy micro-adjust
29.2 — *Outer diameter, mm*
SADDLE .....Fisher Padded
BRAKES .....Alloy direct pull
PEDALS .....Platform
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral QR
34.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 on XS, S), rack mounts

COLORS

Red Metallic HT/Ball burnished • Black decal • Black fork
Black Metallic HT/Green Metallic • White decal • Black fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry gives long front center plus short stem for stability and enhanced steering response. Silver series 7005 aluminum means low weight, high strength. Fork has new dual-stage coil/elastomer spring for plush, progressive spring rate. System is adjusted by external knob. Chromed steel stanchions for smooth action.

COMPONENTS HIGHLIGHTS

Enthusiast level- Acera. Attention to comfort points- pedals, soft grips, wide bars for control, and comfy saddle

WHEELSET HIGHLIGHTS

Matrix rims- light, strong, smooth braking. Stainless spokes resist corrosion, increase wheel life. Tire has very versatile tread pattern which works great almost anywhere.

FIT

Frame	Size	13	16	18	19.5	21
Rider height	Inches	67.9	69.9	74.1	75.7	79.3
	Cm	173	178	188	192	201
Handlebar	Width, mm	600	600	620	620	620
Stem	Length, mm	90	90	110	110	130
	Angle	25	25	25	25	25
Crank	Length, mm	170	170	175	175	175
Seatpost	Length, mm	350	350	350	350	350
Steerer	Length, mm	207	227	247	267	287

GEARING

	24	34	42
11	57	81	100
12	52	74	92
14	45	64	79
16	39	56	69
18	35	50	61
21	30	42	52
26	24	34	42
32	20	28	34

BIKE WEIGHT (est.)

32.1 lb.
14.57 kg.

Wahoo Disc

RIDING STYLE.....Casual Enthusiast or Newbie

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
FORK .....RockShox Judy TT
80 — *Travel, mm*
451.0 — *Axle-crown length, mm*
HEADSET .....Steel
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Sport
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano EF-29
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C050
Top pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Acera-X
CRANKSET .....SR XCC-150, alloy, 42/34/24
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 124.5, Square — *Shell x axle, mm*
CHAIN IG-31
3/32" — *Chain type*
106 — *Chain length (links)*
CASSETTE .....SRAM 5.0 11-32, 8spd

WHEELSET

FRONT WHEEL ....Shimano Alivio disc hub, 32°, Matrix 750 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Shimano Alivio disc hub, 32°, Matrix 750
573 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....IRC Mythos XC
26 x 1.95 — *Tire size*
REAR TIRE .....IRC Mythos XC
26 x 1.95 — *Tire size*
SPOKES .....14G stainless
265, 3x — *Front, mm*
261/262, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Alloy micro-adjust
29.2 — *Outer diameter, mm*
SADDLE .....Fisher Padded
BRAKES .....Shimano M475 disc, mechanical
PEDALS .....Platform
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral QR
34.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 on XS, S), rack mounts

COLORS

Red Metallic HT/Ball burnished • Black decal • Black fork

FRAME AND FORK HIGHLIGHTS

Genesis geometry gives long front center plus short stem for stability and enhanced steering response. Silver series 7005 aluminum means low weight, high strength. Fork has new dual-stage coil/elastomer spring for plush, progressive spring rate. System is adjusted by external knob. Chromed steel stanchions for smooth action.

COMPONENTS HIGHLIGHTS

Enthusiast level equipment with 8-speed Shimano Acera and direct pull brakes.

WHEELSET HIGHLIGHTS

Matrix rims- light, strong, smooth braking. Stainless spokes resist corrosion, increase wheel life. Tire has very versatile tread pattern which works great almost any-

FIT

Frame	Size	13	16	18	19.5	21
Rider height	Inches	67.9	69.9	74.1	75.7	79.3
	Cm	173	178	188	192	201
Handlebar	Width, mm	600	600	620	620	620
Stem	Length, mm	90	90	110	110	130
	Angle	25	25	25	25	25
Crank	Length, mm	170	170	175	175	175
Seatpost	Length, mm	350	350	350	350	350
Steerer	Length, mm	207	227	247	267	287

GEARING

	24	34	42
11	57	81	100
12	52	74	92
14	45	64	79
16	39	56	69
18	35	50	61
21	30	42	52
28	24	34	42
32	20	28	34

BIKE WEIGHT (est.)

32.1 lb.
14.57 kg.

Tarpon

RIDING STYLE.....Casual Enthusiast or Newbie

FRAMESET

MAIN TUBES .....Hi Tensile steel w/Cro-Moly seat tube
STAYS .....Hi Tensile steel
FORK .....High tensile steel
402.3 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel, 30mm rise
25.4 — *Clamp diameter, mm*
STEM .....Alloy Ahead type
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano EF-29
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C051
Top pull, (W-down) — *Cable routing*
31.8 mm/ 1 1/4" — *Attachment*
RR DERAILLEUR ...Shimano Altus GS
CRANKSET .....SR XR100 48/38/28
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
68 x 122.5, Square — *Shell x axle, mm*
CHAIN .....KMC Z-51
3/32" — *Chain type*
110 — *Chain length (links)*
CASSETTE .....Sun Race 13-30, 7spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 36°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Alloy, QR hub, 36°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Bontrager Connection
26 x 1.95 — *Tire size*
REAR TIRE .....Bontrager Connection
26 x 1.95 — *Tire size*
SPOKES 14G
265, 3x — *Front, mm*
261/262, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Alloy micro-adjust
29.2 — *Outer diameter, mm*
SADDLE .....Fisher Padded
BRAKES .....Alloy direct pull
PEDALS .....Platform
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral QR
31.8 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 on XS, S), rack mounts

COLORS

Black Metallic HT/Red Metallic • White decal • Black fork
Black Metallic HT/Silver Metallic • Red decal • Black fork

FRAME AND FORK HIGHLIGHTS

Steel frame is tough and durable. Adapted Genesis geometry provides upright design which is stable and comfortable. Cro-Moly seat tube resists deformation with seat quick release. Fork is light and strong.

COMPONENTS HIGHLIGHTS

Deluxe recreation level- Shimano Altus rear derailleur shifts 21 speeds to get up the hills, direct pull brakes for control. Platform pedals, wide bars for control, and comfy saddle make cycling fun.

WHEELSET HIGHLIGHTS

Matrix rims- light, strong, smooth braking. Tire has very versatile tread pattern which works great almost anywhere.

FIT

Frame	Size	13	17	18.5	19.5	21	17W	18.5W
Rider height	Inches	65.7	67.2	70.6	72.0	75.4	67.3	69.0
	Cm	167	171	179	183	191	171	175
Handlebar	Width, mm	600	600	620	620	620	580	600
Stem	Length, mm	90	90	110	110	130	110	110
	Angle	25	25	25	25	25	40	40
Crank	Length, mm	170	170	175	175	175	170	175
Seatpost	Length, mm	350	350	350	350	350	350	350
Steerer	Length, mm	207	227	247	267	287	227	247

GEARING

	28	38	48
13	56	77	97
15	49	66	84
17	43	59	74
19	39	52	66
22	33	45	57
25	29	40	50
30	24	33	42

BIKE WEIGHT (est.)

31.1 lb.
14.12 kg.

COMFORT SERIES

All new for 2003

We call these the "Comfort" bikes. That's because they place the rider in an upright position that is very comfortable even for a novice or occasional rider. But that is too simple, because a lot of thought and design work went into giving this frame a sporty ride that feels like a cruiser.

We identified the parts that compliment this style of riding. A wide saddle provides better pelvic support, and a suspension seatpost smoothes the bumps. A handlebar stem with an adjustable angle allows more positioning adjustment, and also allows the bike to accommodate a wider range of sizes of riders.

	Frame sizes	14.5	16.5	18.5	21	14.5W	16.5W	18.5W
	Head angle	70.5	70.5	70.5	70.5	70.5	70.5	70.5
	Seat angle	73.5	73.0	73.0	72.5	73.5	73.0	73.0
MILLIMETERS	Standover	659	695	739	770	588	589	595
	Seat tube	368	419	470	533	368	419	470
	Head tube	135	155	215	235	135	155	215
	Eff top tube	544	559	579	595	540	548	570
	Chainstays	435	435	435	435	435	435	435
	BB height	287	287	287	287	287	287	287
	Offset	38.0	38.0	38.0	38.0	38.0	38.0	38.0
	Trail	79	79	79	79	79	79	79
	Wheelbase	1011	1032	1059	1080	1011	1032	1059
INCHES	Standover	25.9	27.4	29.1	30.3	23.2	23.2	23.4
	Seat tube	14.5	16.5	18.5	21.0	14.5	16.5	18.5
	Head tube	5.3	6.1	8.5	9.3	5.3	6.1	8.5
	Eff top tube	21.4	22.0	22.8	23.4	21.3	21.6	22.4
	Chainstays	17.1	17.1	17.1	17.1	17.1	17.1	17.1
	BB height	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	Offset	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Trail	3.1	3.1	3.1	3.1	3.1	3.1	3.1
	Wheelbase	39.8	40.6	41.7	42.5	39.8	40.6	41.7

Then we started the frame design with a clean slate, focusing on making the bike fit perfectly with the parts we had selected. Sure, you could put these same parts on another bike, but the Comfort design places the parts to perfection. A suspension seatpost cannot slide down into the frame as far as a standard post, and a wide saddle is normally going to stand taller than a narrower model. On the Comfort bike, we dropped the seat cluster so the saddle can be placed where you want it, and the taller front end places the handlebars in just the right position to relax your shoulders and arms. Our Comfort design creates a synergy between bike and rider that makes riding fun again.

Not satisfied with merely perfecting the bike fit, we wanted to make a bike that can do it all. To turn a bike from simple fun into the ultimate mode of transportation, we looked at the features on a long-distance touring bike. Chief among those is the ability to add a rear rack and panniers (side bags) for carrying gear to the gym, or groceries home. To make the rack really work right, we increased the length of the chainstays. While increasing the chainstay length helps frame comfort, we did this mostly to add heel clearance so you won't kick your panniers as you pedal.

The comfort series also has the new Accessories Port. This clever unit can be seen right behind the seatpost, on the seatstays. Choose from a series of special accessories, and you can change from a rear rack to a trailer bike in seconds. And you can make the change without tools!

Special parts

Seat collar 981630
Derailleur hanger 230026

Geometry

The Comfort series is designed with geometry which puts you in a full 'heads up' position. The dimensions look a bit odd on paper, but there is a reason; we designed these frames from the ground up to use suspension seatposts and adjustable stems.

Ride

For the recreational cyclist, these bikes are an epiphany. Instead of focusing on race qualities like carving turns, or power uphill, the Comfort series' first feature is comfort. Some aficionados will point out that an upright position is not aero, and is therefore inefficient. We'll point out that if you are off the bike because your back hurts, aerodynamic efficiency isn't worth much. Furthermore, the rider on a Comfort series bike is not trying to beat the clock, they just want to have fun.

Riding a Comfort series bike, you will enjoy anything from a spin around the neighborhood to commuting and day tours. The comfort features, like suspension fork, sprung saddle, or seatpost are all tuned to react at low bump forces, so you don't have to be going really fast or hit big bumps to enjoy their benefits. The smooth tires make these bikes pretty fast, but the large footprint also makes them stable on dirt footpaths or Rails-to-Trails tours.

Frame details

The Comfort series uses Silver series aluminum frame technology.

Designed for suspension seatposts and adjustable stems, this frame has a unique look to it. The seat tube is short compared to other bikes because a suspension seatpost has a section which cannot be lowered into the frame. This means the normal seat height is quite a ways above the top tube. Meanwhile, this rider wants to sit upright. If a suspension seatpost were put on a 'normal' frame, the head tube would be too short to position the handlebars for a comfortable, bent-elbow position.

Comfort series bikes have 2 water bottle mounts, except the 14.5" and Ladies frames. These frame sizes do not have enough seat tube to allow a water bottle mount to be used.

Presidio

RIDING STYLE ..... **Comfort**

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
FORK .....RockShox Serra GPS
60 — *Travel, mm*
451 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel riser
25.4 — *Clamp diameter, mm*
STEM .....Alloy quick change, adjustable rise, direct connect
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....SRAM DualDrive
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Fisher dual density

DRIVETRAIN

RR DERAILLEUR ...SRAM ESP 7.0
CRANKSET .....SRAM DualDrive, 38T, w/chainguard
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 116, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-73
9 speed — *Chain type*
112 — *Chain length (links)*
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix 750 rim
572 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....SRAM DualDrive hub, 32°, Matrix 750 rim
572 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Hutchinson Acrobat w/Anti-Puncture
26 x 1.95 — *Tire size*
REAR TIRE .....Hutchinson Acrobat w/Anti-Puncture
26 x 1.95 — *Tire size*
SPOKES 14G
261, 3x — *Front, mm*
255/256, 3x — *Rear, mm*
INNER TUBES .....Presta valve w/Slime sealant

OTHER

SEATPOST .....Suspension, alloy
27.2 — *Outer diameter, mm*
SADDLE .....Oasis Webspring w/flashing light
BRAKES .....Alloy direct pull
PEDALS .....Platform, dual density
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/quick release
31.8 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts (1 bottle/no rack on Women's)

COLORS

Silver Metallic HT/Gold Metallic • Black decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Comfort geometry uses special design for suspension post and adjustable stem to provide upright position and maximum comfort. Silver series 7005 aluminum means low weight, high strength. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Sophisticated recreation level- SRAM DualDrive. Road-type gearing- easy uphills, plus you don't have to over-spin on the downhill. Suspension fork, seatpost- soft springs for comfort suspension. Attention to comfort points- user friendly pedals, wide bars for control, and comfy sprung saddle

WHEELSET HIGHLIGHTS

Matrix rim- light for speed, smooth braking. Tires have smooth tread for speed. Wide casing for low-pressure comfort. Puncture resistant casing keeps you rolling.

FIT

Frame	Size	14.5	16.5	18.5	21
Rider height	Inches	68.4	69.8	74.6	75.9
	Cm	174	177	190	193
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	105	105	125	125
	Angle	40	40	40	40
Crank	Length, mm	170	170	170	170
Seatpost	Length, mm	350	350	350	350
Steerer	Length, mm	235	255	315	335

GEARING

	33		
11	66	91	124
13	61	83	113
15	52	71	97
17	45	62	84
20	40	55	75
23	34	47	64
26	28	38	52
30	23	31	4
32	23	31	42

BIKE WEIGHT (est.)

34.3 lb.
15.57 kg.

Solstice

RIDING STYLE ..... **Comfort**

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
FORK .....RockShox Serra GPS
60 — *Travel, mm*
454 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel riser
25.4 — *Clamp diameter, mm*
STEM .....Alloy quick change, adjustable rise, direct connect
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Alivio RapidFire+
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano T301
Down pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Deore SGS
CRANKSET .....Shimano T303 48/38/28, w/chainguard
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 118, Square — *Shell x axle, mm*
CHAIN IG-51
3/32" — *Chain type*
112 — *Chain length (links)*
CASSETTE .....SRAM 5.0 11-32, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix 750 rim
572 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Shimano C201 hub, 32°, Matrix 750 rim
572 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Hutchinson Acrobat w/Anti-Puncture
26 x 1.95 — *Tire size*
REAR TIRE .....Hutchinson Acrobat w/Anti-Puncture
26 x 1.95 — *Tire size*
SPOKES .....14G stainless
261, 3x — *Front, mm*
258/259, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve w/Slime sealant

OTHER

SEATPOST .....Suspension, alloy
27.2 — *Outer diameter, mm*
SADDLE .....Oasis Webspring w/flashing light
BRAKES .....Alloy direct pull
PEDALS .....Platform, dual density
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/quick release
31.8 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts (1 bottle/no rack on Women's)

COLORS

Silver Metallic HT/Charcoal Metallic • Silver decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Comfort geometry uses special design for suspension post and adjustable stem to provide upright position and maximum comfort. Silver series 7005 aluminum means low weight, high strength. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Sport level includes Shimano Deore derailleur for durable and smooth shifts. Wide range, 24 speed gearing for fast version of comfortable hybrid design.

WHEELSET HIGHLIGHTS

Matrix rim- light for speed, smooth braking. Stainless spokes resist corrosion, increase wheel life. Tires have smooth tread for speed. Wide casing for low-pressure comfort. Puncture resistant casing keeps you rolling.

FIT

Frame	Size	14.5	16.5	18.5	21	14.5W	16.5W	18.5W
Rider height	Inches	68.6	69.9	74.7	76.0	68.4	68.9	74.0
	Cm	174	178	190	193	174	175	188
Handlebar	Width, mm	600	600	600	600	600	600	600
Stem	Length, mm	105	105	125	125	105	105	125
	Angle	40	40	40	40	40	40	40
Crank	Length, mm	170	170	170	170	170	170	170
Seatpost	Length, mm	350	350	350	350	350	350	350
Steerer	Length, mm	235	255	315	335	235	255	315

GEARING

	28	38	48
11	67	91	114
12	61	83	105
14	52	71	90
16	46	62	79
18	41	55	70
21	35	47	60
26	28	38	48
32	23	31	39

BIKE WEIGHT (est.)

34.3 lb.
15.57 kg.

Napa

RIDING STYLE ..... **Comfort**

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
FORK .....RST Capa TL
75 — *Travel, mm*
435 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel
25.4 — *Clamp diameter, mm*
STEM .....Alloy quick change, adjustable rise, direct connect
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano EF-29
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C102
Down pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Alivio
CRANKSET .....Shimano C203 48/38/28, w/chainguard
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 116, Square — *Shell x axle, mm*
CHAIN IG-51
3/32" — *Chain type*
112 — *Chain length (links)*
CASSETTE .....SRAM 5.0 11-32, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix 750 rim
572 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Shimano RM-40 hub, 32°, Matrix 750 rim
572 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Hutchinson Acrobat
26 x 1.95 — *Tire size*
REAR TIRE .....Hutchinson Acrobat
26 x 1.95 — *Tire size*
SPOKES .....14G stainless
261, 3x — *Front, mm*
259/260, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Suspension, alloy
27.2 — *Outer diameter, mm*
SADDLE .....Oasis Webspring
BRAKES .....Alloy direct pull
PEDALS .....Platform, dual density
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/quick release
31.8 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts (1 bottle/no rack on Women's)

COLORS

Silver Metallic HT/Red Metallic • Silver decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Comfort geometry uses special design for suspension post and adjustable stem to provide upright position and maximum comfort. Silver series 7005 aluminum means low weight, high strength. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Recreation level includes Alivio and Shimano C Series. Attention to comfort points- dual density pedals, wide bars for control, and comfy sprung saddle on suspension seatpost.

WHEELSET HIGHLIGHTS

Matrix 750 rims are strong and light. The quick-release hub design makes removing and installing wheels easy without tools. Stainless spokes resist corrosion, increase wheel life. Tires have smooth tread for speed. Wide casing for low-pressure comfort. Puncture resistant casing keeps you rolling.

FIT

Frame	Size	14.5	16.5	18.5	21	14.5W	16.5W	18.5W
Rider height	Inches	67.6	69.0	73.8	75.1	67.4	68.0	73.0
	Cm	172	175	187	191	171	173	185
Handlebar	Width, mm	600	600	600	600	600	600	600
Stem	Length, mm	105	105	125	125	105	105	125
	Angle	40	40	40	40	40	40	40
Crank	Length, mm	170	170	170	170	170	170	170
Seatpost	Length, mm	350	350	350	350	350	350	350
Steerer	Length, mm	235	255	315	335	235	255	315

GEARING

	28	38	48
11	67	91	114
12	61	83	105
14	52	71	90
16	46	62	79
18	41	55	70
21	35	47	60
26	28	38	48
32	23	31	39

BIKE WEIGHT (est.)

34.3 lb.
15.57 kg.

Capitola

RIDING STYLE ..... **Comfort**

FRAMESET

MAIN TUBES .....Silver series 7005 aluminum
STAYS .....Silver series 7005 aluminum
FORK .....High tensile steel
398 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
25.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel, riser
25.4 — *Clamp diameter, mm*
STEM .....Alloy, adjustable rise, direct connect
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano EF-29
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C051
Down pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Altus GS
CRANKSET .....SR XCC-100 48/38/28 w/chainguard
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 124.5, Square — *Shell x axle, mm*
CHAIN .....KMC Z-51
3/32" — *Chain type*
112 — *Chain length (links)*
CASSETTE .....Shimano ZH37 13-34, 7spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Alloy, QR hub, 32°, Matrix 550 rim
573 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Hutchinson Acrobat
26 x 1.95 — *Tire size*
REAR TIRE .....Hutchinson Acrobat
26 x 1.95 — *Tire size*
SPOKES 14G
267, 3x — *Front, mm*
264/265, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Suspension, alloy
27.2 — *Outer diameter, mm*
SADDLE .....Oasis Webspring
BRAKES .....Alloy direct pull
PEDALS .....Platform, dual density
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/quick release
31.8 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts (1 bottle/no rack on Women's)

COLORS

Silver Metallic HT/Blue Metallic • Silver decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Comfort geometry uses special design for suspension post and adjustable stem to provide upright position and maximum comfort. Silver series 7005 aluminum means low weight, high strength. Fork is light and strong.

COMPONENTS HIGHLIGHTS

Recreation level- 21 speed to get up the hills, direct pull brakes for control. Platform pedals, wide bars for control, and comfy saddle make cycling fun. Even a chainguard!

WHEELSET HIGHLIGHTS

Matrix rims- light, strong, smooth braking. Tires have smooth tread for speed. Wide casing for low-pressure comfort. Puncture resistant casing keeps you rolling.

FIT

Frame	Size	14.5	16.5	18.5	21	14.5W	16.5W	18.5W
Rider height	Inches	66.1	67.4	72.1	73.3	65.9	66.4	71.3
	Cm	168	171	183	186	167	169	181
Handlebar	Width, mm	600	600	600	600	600	600	600
Stem	Length, mm	105	105	125	125	105	105	125
	Angle	40	40	40	40	40	40	40
Crank	Length, mm	170	170	170	177	170	170	175
Seatpost	Length, mm	350	350	350	350	350	350	350
Steerer	Length, mm	235	255	315	335	235	255	315

GEARING

	28	38	48
13	56	77	97
15	49	66	84
17	43	59	74
19	39	52	66
22	33	45	57
26	28	38	48
34	22	29	37

BIKE WEIGHT (est.)

34.3 lb.
15.57 kg.

HYBRIDS

For 2003

These frames remain unchanged from 2000.

Geometry

Most of our Hybrid frames are just that- a blend of road and mountain bike geometries. They use lightweight, large diameter 700c wheels for speed and a smooth ride. They use mountain bike angles and wheelbase dimensions for stability and a more upright position.

	Frame sizes	13	15	17.5	20	22.5	25	15W	17.5W	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	72.5	74.0	74.0	73.0
MILLIMETERS	Standover	654	685	731	769	817	864		603	604.7
	Seat tube	330	381	445	508	572	635	381	445	508
	Head tube	90	90	105	105	125	145	105	125	145
	Eff top tube	538	544	548	565	581	592	543	547	563
	Chainstays	445	445	445	445	445	445	445	445	445
	BB height	281	281	281	281	281	281	281	281	281
	Offset	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
	Trail	74	74	70	70	64	64	74	70	70
	Wheelbase	1055	1056	1056	1062	1069	1075	1056	1056	1062
INCHES	Standover	25.8	27.0	28.8	30.3	32.2	34.0		23.7	23.8
	Seat tube	13.0	15.0	17.5	20.0	22.5	25.0	15	17.5	20
	Head tube	3.5	3.5	4.1	4.1	4.9	5.7	4.1	4.9	5.7
	Eff top tube	21.2	21.4	21.6	22.2	22.9	23.3	21.4	21.5	22.2
	Chainstays	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
	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	41.6	41.6	41.6	41.8	42.1	42.3	41.6	41.6	41.8

The Fast City has an unique geometry for this type of bike; it has a focus on performance, with other hybrid features being secondary. This is the bike for those who always thought a hybrid made sense but the ride was too docile.

Fast City

	Frame sizes	15.5	17.5	19	21
	Head angle	70.5	71.0	71.5	71.5
	Seat angle	74.0	74.0	73.5	73.0
MILLIMETERS	Standover	695	729	757	799
	Seat tube	394	442	479	529
	Head tube	80	80	90	105
	Eff top tube	590	608	628	647
	Chainstays	440	440	440	440
	BB height	292	292	292	297
	Offset	42.0	42.0	42.0	42.0
	Trail	87	83	80	80
	Wheelbase	1081	1094	1103	1119
INCHES	Standover	27.3	28.7	29.8	31.5
	Seat tube	15.5	17.4	18.9	20.8
	Head tube	3.1	3.1	3.5	4.1
	Eff top tube	23.2	23.9	24.7	25.5
	Chainstays	17.3	17.3	17.3	17.3
	BB height	11.5	11.5	11.5	11.7
	Offset	1.7	1.7	1.7	1.7
	Trail	3.4	3.3	3.1	3.1
	Wheelbase	42.6	43.1	43.4	44.1

Ride

Our Hybrid bikes offer stable handling and steady tracking. They smoothly glide over the ground, and are not as reactive to weight changes or bumps and other irregular terrain. This makes them ideal for all-round riding, commuting, or those just getting into cycling.

Frame details

The aluminum hybrid frames use Silver series frame technology. With this frame, somewhat oversize tubing creates a rigid structure between the bottom bracket and head tube, for pedaling efficiency. But we didn't overdo the stiffness; our Silver series hybrids are very comfortable and shock absorptive.

The Fast City, being a performance-oriented hybrid, is equipped with our premium Platinum butted ZR9000 tubeset.

Hybrid bikes have 2 water bottle mounts, except the Ladies sizes. These frame sizes do not have enough seat tube to allow a water bottle mount to be used.

Special parts

Seat collar 981630
Fast City seat collar 211488
Derailleur hanger 992562

Utopia

RIDING STYLE .....Performance commuter, extended urban adventure, or Fast day tourer

FRAMESET

MAIN TUBES .....Silver series aluminum
STAYS .....Silver series aluminum
FORK .....RockShox GPS Metro
50 — *Travel, mm*
456 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Sport
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Deore RapidFire+
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore
Top pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Deore LX SGS
CRANKSET .....Shimano Deore 48/36/26
64/104 — *Bolt hole circle, mm*
BB .....Shimano BB-UN40
73 x 113, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
112 — *Chain length (links)*
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Select Hybrid, 20°
592 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Bontrager Select Hybrid, 24°
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Select Invert
700 x 35c — *Tire size*
REAR TIRE .....Bontrager Select
700 x 35c — *Tire size*
SPOKES .....DT 14/15G butted stainless
278, Radial — *Front, mm*
294/293, 2x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
27.2 — *Outer diameter, mm*
SADDLE .....Oasis
BRAKES .....Alloy direct pull
PEDALS .....Alloy/alloy cage w/clips and straps
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral QR
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts

COLORS

Silver Metallic HT/Slate Blue Metallic • Silver decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Hybrid geometry is a blend of mountain style comfort and road style responsiveness. Silver series 7005 aluminum means low weight, high strength. Fork uses coil spring for plush feel. Bosses for fenders, light, panniers, and disc brake.

COMPONENTS HIGHLIGHTS

27 speed wide-ratio gearing makes it easy to pedal up hill and also provides a high gear like a road bike. Bontrager bars, stem, and seatpost are strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. They use butted spokes for stronger wheels and lower weight. Tires have continuous center tread which reduces rolling resistance and noise. Inverted tread provides traction, yet feels smooth. Large casing size, for a road tire, makes it extra comfortable.

FIT

Frame	Size	15	17.5	20	22.5
Rider height	Inches	67.4	67.9	70.1	72.2
	Cm	171	172	178	183
Handlebar	Width, mm	620	620	620	620
Stem	Length, mm	90	90	105	105
	Angle	15	15	15	15
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	183.5	198.5	198.5	218.5

GEARING

	26	36	48
11	64	89	119
13	54	75	101
15	47	65	87
17	42	58	77
20	35	49	65
23	31	43	57
26	27	38	50
30	24	33	44
34	21	29	38

BIKE WEIGHT (est.)

27.1 lb.
12.30 kg.

Nirvana

RIDING STYLE.....Pleasure rider or Newbie

FRAMESET

MAIN TUBES .....Silver series aluminum
STAYS .....Silver series aluminum
FORK .....Sync Odessa 168
45 — *Travel, mm*
450 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Crowbar Sport
25.4 — *Clamp diameter, mm*
STEM .....Alloy quick change, adjustable rise, direct connect
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....GripShift Centera
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Nexave T301
Top pull, (W-down) — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Deore SGS
CRANKSET .....Shimano Nexave 303 48/38/28, w/chainguard
Riveted — *Bolt hole circle, mm*
BB .....Shimano BB-CT92
73 x 121, Square — *Shell x axle, mm*
CHAIN HG-50
3/32" — *Chain type*
112 — *Chain length (links)*
CASSETTE .....Shimano HG50-I 11-30, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Bontrager Fairlane rim
604 — *E.R.D., mm*
Velox 19mm — *Rim strip*
REAR WHEEL .....Shimano C201 hub, 32°, Btgr Fairlane rim
604 — *E.R.D., mm*
Velox 19mm — *Rim strip*
FRONT TIRE .....Bontrager Select Invert
700 x 38c — *Tire size*
REAR TIRE .....Bontrager Invert II
700 x 38c — *Tire size*
SPOKES .....DT 14G stainless
296, 3x — *Front, mm*
294/295, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Suspension, alloy
27.2 — *Outer diameter, mm*
SADDLE .....Oasis
BRAKES .....Alloy direct pull
PEDALS .....Alloy/alloy cage, clipless adaptable
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral QR
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 on 13, 15, 17.5L), rack mounts

COLORS

Silver Metallic HT/Red Metallic • Silver decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Hybrid geometry is a blend of mountain style comfort and road style responsiveness. Silver series 7005 aluminum means low weight, high strength. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

27 speed wide-ratio gearing makes it easy to pedal up hill and also provides a high gear like a road bike. Bontrager bars and stem are strong, yet light weight. GripShift shifting allows intuitive, flick-of-the-wrist gear changes. The suspension seatpost smoothes the ride. Adjustable stem lets you tune the fit and ride performance.

WHEELSET HIGHLIGHTS

Bontrager rim- light for speed, smooth braking Tires have continuous center tread which reduces rolling resistance and noise. Inverted tread provides traction, yet feels smooth. Large casing size, for a road tire, makes it extra comfortable.

FIT

Frame	Size	13	15	17.5	20	22.5	17.5W
Rider height	Inches	66.8	66.9	67.8	68.2	70.4	67.8
	Cm	170	170	172	173	179	172
Handlebar	Width, mm	620	620	620	620	620	620
Stem	Length, mm	105	105	105	105	105	105
	Angle	35	35	35	35	35	35
Crank	Length, mm	170	170	170	170	170	170
Seatpost	Length, mm	315	315	350	350	350	315
Steerer	Length, mm	192.5	192.5	207.5	207.5	227.5	227.5

GEARING

	28	38	48
11	69	94	119
13	59	80	101
15	51	69	87
17	45	61	77
20	38	52	65
23	33	45	57
26	29	40	50
30	25	35	44

BIKE WEIGHT (est.)

29.1 lb.
13.21 kg.

Fast City

RIDING STYLE .....Performance commuter, extended urban adventure, or Fast day tourer

FRAMESET

MAIN TUBES .....Platinum series butted ZR9000
STAYS .....Platinum series aluminum
FORK .....Manitou Luxe Super
75 — *Travel, mm*
483.3 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Select
25.4 — *Clamp diameter, mm*
BAR ENDS .....Cane Creek Ergo
STEM .....Bontrager Select
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Deore RapidFire+
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano Deore LX
Top pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Deore XT SGS
CRANKSET .....Shimano Deore 48/36/26
64/104 — *Bolt hole circle, mm*
BB .....Shimano BB-UN40
73 x 113, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
112 — *Chain length (links)*
CASSETTE .....SRAM 7.0 11-34, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Select Hybrid, 20°
592 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Bontrager Select Hybrid, 24°
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Select Invert
700 x 35c — *Tire size*
REAR TIRE .....Bontrager Select
700 x 35c — *Tire size*
SPOKES .....DT 14/15G butted stainless
278, Radial — *Front, mm*
294/293, 2x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
31.6 — *Outer diameter, mm*
SADDLE .....Titec Ithys Amore
BRAKES .....Shimano M420, V type
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
36.4 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts

COLORS

Silver Metallic HT/Bronze Metallic • Black decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Performance hybrid geometry is more aggressive position and handling in a comfortable city bike. ZR9000 Platinum series aluminum means light weight with very high fatigue strength. Fork has coil/McU spring with external preload adjuster for plush ride. Magnesium legs for low weight. Leading axle design. Includes mounts for fenders, disc brake.

COMPONENTS HIGHLIGHTS

27 speed wide-ratio gearing makes it easy to pedal up hill and also provides a high gear like a road bike. Bontrager bars, stem, and seatpost are strong, yet light weight.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. They use butted spokes for stronger wheels and lower weight. Tires have continuous center tread which reduces rolling resistance and noise. Inverted tread provides traction, yet feels smooth. Large casing size, for a road tire, makes it extra comfortable.

FIT

Frame	Size	15.5	17.5	19	21
Rider height	Inches	68.8	71.4	74.2	75.3
	Cm	175	181	188	191
Handlebar	Width, mm	600	600	600	600
Stem	Length, mm	75	90	105	105
	Angle	5	5	10	10
Crank	Length, mm	170	175	175	175
Seatpost	Length, mm	300	350	350	350
Steerer	Length, mm	173.5	173.5	183.5	198.5

GEARING

	26	36	48
11	69	95	127
13	58	80	107
15	50	70	93
17	44	61	82
20	38	52	70
23	33	45	61
26	29	40	54
30	25	35	46
34	22	31	41

BIKE WEIGHT (est.)

25.4 lb.
11.53 kg.

Zebrano

RIDING STYLE.....Casual Enthusiast or Newbie

FRAMESET

MAIN TUBES .....Silver series aluminum
STAYS .....Silver series aluminum
3.5 lb. (1.59 kg.) — *Frame weight (estimated)*
FORK .....Sync Odessa 168
60 — *Travel, mm*
451 — *Axle-crown length, mm*
HEADSET .....Semi-cartridge
25.4/34.0/30.0 — *Size*
36.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Alloy riser
25.4 — *Clamp diameter, mm*
STEM .....Alloy adjustable rise
Steerer clamp height, mm
SHIFT LEVERS .....Shimano EF-29
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C102
Top pull, (W-down) — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Alivio
CRANKSET .....Shimano C203 48/38/28, w/chainguard
Riveted — *Bolt hole circle, mm*
BB .....Cartridge
73 x 116, Square — *Shell x axle, mm*
CHAIN IG-51
3/32" — *Chain type*
114 — *Chain length (links)*
CASSETTE .....SRAM 5.0 11-32, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix 750 rim
635 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Shimano RM-40 hub, 32°, Matrix 750 rim
635 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Bontrager Select Invert
700 x 38c — *Tire size*
REAR TIRE .....Bontrager Select Invert
700 x 38c — *Tire size*
SPOKES .....14G stainless
292, 3x — *Front, mm*
289/291, 3x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Suspension
27.2 — *Outer diameter, mm*
SADDLE .....Oasis Webspring
BRAKES .....Alloy direct pull w/modulator, front
Alloy direct pull, rear
PEDALS .....Platform, dual density
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/quick release
31.8 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts

COLORS

Silver Metallic HT/Black Metallic • Silver decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Hybrid geometry is a blend of mountain style comfort and road style responsiveness. Silver series 7005 aluminum means low weight, high strength. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Recreation level includes Shimano C Series. Attention to comfort points- dual density pedals, wide bars for control, and comfy sprung saddle on suspension seatpost.

WHEELSET HIGHLIGHTS

Matrix 750 rims are strong and light. The quick-release hub design makes removing and installing wheels easy without tools. Stainless spokes resist corrosion, increase wheel life. Tires have continuous center tread which reduces rolling resistance and noise. Inverted tread provides traction, yet feels smooth. Large casing size, for a road tire, makes it extra comfortable.

FIT

Frame	Size	15	17.5	20	22.5	25	15W	17.5W	20W
Rider height	Inches	65.6	66.6	69.0	71.3	71.3	66.2	69.3	70.1
	Cm	167	169	175	181	181	168	176	178
Handlebar	Width, mm	580	580	600	600	620	580	600	600
Stem	Length, mm	90	90	110	110	110	90	110	110
	Angle	40	40	40	40	40	40	40	40
Crank	Length, mm	170	170	170	170	170	170	170	170
Seatpost	Length, mm	350	350	350	350	350	350	350	350
Steerer	Length, mm	129	144	144	164	184	144	164	184

GEARING

	28	38	48
11	69	94	119
12	64	86	109
14	54	74	93
16	48	65	82
18	42	58	73
21	36	49	62
26	29	40	50
32	24	32	41

BIKE WEIGHT (est.)

30.0 lb.
13.62 kg.

Tiburon

RIDING STYLE.....Pleasure rider or Newbie

FRAMESET

MAIN TUBES .....Silver series aluminum
STAYS .....Silver series aluminum
3.5 lb. (1.59 kg.) *Frame weight (estimated)*
FORK .....Sync Odessa 160
60 *Travel, mm*
410 *Axle-crown length, mm*
HEADSET .....Semi-cartridge
25.4/34.0/30.0 *Size*
36.5 *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel
25.4 *Clamp diameter, mm*
STEM .....Alloy adjustable rise
Steerer clamp height, mm
SHIFT LEVERS .....Shimano EF-29 RapidFire+
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Fisher dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano C051
Top pull, (W-down) *Cable routing*
34.9 mm/ 1 3/8" *Attachment*
RR DERAILLEUR ...Shimano Altus GS
CRANKSET .....SR XCC-100, 48/38/28 w/chainguard
Riveted *Bolt hole circle, mm*
BB .....Cartridge
73 x 122.5, Square *Shell x axle, mm*
CHAIN .....KMC Z-51
3/32" *Chain type*
116 *Chain length (links)*
CASSETTE .....Shimano ZH37 13-34, 7spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 36°, Matrix 550 rim
635 *E.R.D., mm*
Rubber *Rim strip*
REAR WHEEL .....Alloy, QR hub, 36°, Matrix 550 rim
635 *E.R.D., mm*
Rubber *Rim strip*
FRONT TIRE .....Bontrager Select Invert
700 x 38c *Tire size*
REAR TIRE .....Bontrager Select Invert
700 x 38c *Tire size*
SPOKES .....14G stainless
295, 3x *Front, mm*
292/293, 3x *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Suspension
27.2 *Outer diameter, mm*
SADDLE .....Oasis Webspring
BRAKES .....Alloy direct pull w/modulator, front
Alloy direct pull, rear
PEDALS .....Platform, dual density
9/16" *Axle diameter*
SEAT BINDER .....Alloy w/quick release
31.8 *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, rack mounts

COLORS

Silver Metallic HT/Blue Metallic • White decal • Silver fork

FRAME AND FORK HIGHLIGHTS

Hybrid geometry is a blend of mountain style comfort and road style responsiveness. Silver series 7005 aluminum means low weight, high strength. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Deluxe recreation level- Shimano Altus rear derailleur shifts 21 speeds to get up the hills, direct pull brakes for control. Platform pedals, wide bars for control, and comfy saddle make cycling fun.

WHEELSET HIGHLIGHTS

Matrix rim- light for speed, smooth braking. Stainless spokes resist corrosion, increase wheel life. Tires have continuous center tread which reduces rolling resistance and noise. Inverted tread provides traction, yet feels smooth. Large casing size, for a road tire, makes it extra comfortable.

FIT

Frame	Size	15	17.5	20	22.5	15W	17.5W	20W
Rider height	Inches	63.7	64.7	66.9	69.2	65.7	66.8	67.4
	Cm	162	164	170	176	167	170	171
Handlebar	Width, mm	580	580	600	600	580	580	600
Stem	Length, mm	90	90	110	110	110	110	110
	Angle	40	40	40	40	40	40	40
Crank	Length, mm	170	175	175	175	170	170	175
Seatpost	Length, mm	350	350	350	350	350	350	350
Steerer	Length, mm	129	144	144	164	164	164	184

GEARING

	28	38	48
13	59	80	101
15	51	69	87
17	45	61	77
19	40	54	69
22	35	47	59
26	29	40	50
34	22	30	38

BIKE WEIGHT (est.)

28.2 lb.
12.80 kg.

YOUTH MOUNTAIN BIKES

For 2003

These Fishers will fit both smaller adults and kids. They have been very well accepted because they ride great, and remain unchanged for 2003.

Mt. Jam FS

Frame sizes	S
Head angle	70.0
Seat angle	71.5
MILLIMETERS	
Standover	
Seat tube	380
Head tube	100
Eff top tube	529
Chainstays	400
BB height	306
Offset	45.0
Trail	62
Wheelbase	993
INCHES	
Standover	
Seat tube	15.0
Head tube	3.9
Eff top tube	20.8
Chainstays	15.7
BB height	12.0
Offset	1.8
Trail	2.5
Wheelbase	39.1

Geometry

These frames use a geometry which delivers performance for a smaller rider. The head angles are slightly slackened to allow good off-road stability for a rider with less upper body strength. Standover is maximized to allow a rider to get on early, and ride it for a longer period of time as they grow.

Ride

These are real mountain bikes, and that's how they ride. This is important, because although we show them in the Kids section in the catalog, they have the ride performance and handling required to be enjoyed by smaller adults.

Hardtails

Frame sizes	13B
Head angle	70.0
Seat angle	72.0
MILLIMETERS	
Standover	606
Seat tube	335
Head tube	90
Eff top tube	524
Chainstays	405
BB height	272
Offset	45.0
Trail	62
Wheelbase	983
INCHES	
Standover	23.9
Seat tube	13.2
Head tube	3.5
Eff top tube	20.6
Chainstays	15.9
BB height	10.7
Offset	1.8
Trail	2.5
Wheelbase	38.7

Frame details

These bikes use hi-tensile steel, and with a Cro-Moly seat tube on the hardtails. The advantage of Cro-Moly steel is higher tensile strength and fatigue resistance; it's no more rigid than good hi-tensile steel. For this reason, we've only used Cro-Moly in the seat tube, which can see lots of flexing as the seatpost quick release is used. For the rest of the bike, we've focused on providing the best ride for the cost. By carefully designing the frame geometry, tubing wall thicknesses, and tubing diameters, we've managed to get a lot of ride from a less expensive frame material. This allows riders a viable high quality alternative to chain store bikes which don't ride nearly as well.

Bike Fit

We remind you that the fit information is for an average rider with the handlebars adjusted to their highest possible position. The rider fitting this bike may be several inches taller than our recommendations due to personal preference or other factors which we can't readily predict. But we do expect that a smaller rider would also fit a given bike simply by lowering the handlebars.

KIDS' BIKES

For 2003

These successful frames remain unchanged from 2002.

Geometry

Our Kids' bikes are designed to satisfy both kids and their parents. By carefully designing the frame and components, we make the bikes easier for kids to get on and ride. At the same time, we make the bikes provide a wider range of fit so kids can get on a model early, and enjoy it longer as they grow.

Ride

Within the normal limits of parts availability, we've looked at keeping the pedals close together. We use size specific crank lengths, bar widths, and saddle sizing. We keep the bottom brackets as low as possible for easy on and off, as well as a low center of gravity. When we spec a hand brake, we also make sure that fits. With our attention to these details, Fisher kids bikes are easier to learn on, and more fun to ride.

Frame details

Parents are concerned with durability and cost. These bikes offer solid construction, designs that provide wide fit ranges, and value.

These bikes aren't really about a technical dissertation, so we don't even include frame geometry here. The important difference here is that our Kids' bikes go through the full Fisher testing regimen. Passing this rigorous evaluation means they're designed and built to last.

For the rest of the bike, we've focused on providing the best ride for the cost. By carefully designing the frame geometry and tubing, and carefully selecting the components, we've managed to get a lot of ride from a bike that will still pass our testing requirements. This allows riders a viable high quality alternative to chain store bikes which don't ride or last nearly as well. These are bikes that can be handed down from kid to kid as a family grows, and which will promote cycling because they make riding more fun.

Extra attention to specs on kids' bikes.

To an experienced cyclist, many of the details of our Kids' bikes may seem humdrum or at best 'normal'. There-in lies a key to our Fisher kids' bikes; they use parts you'd expect on other Fisher bikes. While other brands may use plastic bushings, we use real, round steel ball bearings because the parts will run smoother and last longer. Even on our 12" wheeled models. On bikes where we spec training wheels, they are massively overbuilt, because we know your toddler is depending on them. We use 4 bolt stems, for extra handlebar security (parents, just how often do you thoroughly check your kids' bikes?). Our saddles use adjustable seatpost clamps, offering both fore/aft adjustment and tilt. Just like on an adult bike, this allows proper positioning and comfort for your child. Many of our competitors forego these simple details to cut costs. We go the extra mile and specify size specific cranks, handlebars, pedals, and even saddles. For bikes with hand brakes, we've found better fitting levers, so your child can comfortably apply all the stopping power they need. All this attention costs a bit more, but we think your child will be more comfortable, safer, and learn faster on a Fisher bike.

Tyro

RIDING STYLE ... Rough-riding kid or athletic new rider

FRAMESET

MAIN TUBES	Hi Tensile steel	
STAYS	Hi Tensile steel	
	6.8 lb. (3.10 kg.)	*Frame weight (estimated)*
FORK	RST 154E	
	406.4	*Axle-crown length, mm*
	50	*Travel, mm*
HEADSET	Steel	
	25.4/34.0/30.0	*Size*
	36.5	*Stack height, mm*

CONTROLS

HANDLEBAR	Steel	
	22.2	*Clamp diameter, mm*
STEM	Alloy adjustable rise, quick change, quill	
		Steerer clamp height, mm
SHIFT LEVERS	SRAM MRX Plus	
BRAKE LEVERS	Alloy, direct pull	
GRIPS	Kraton	

DRIVETRAIN

FT DERAILLEUR	Shimano C050	
	Down pull	*Cable routing*
	31.8 mm/ 1 1/4"	*Attachment*
RR DERAILLEUR	Shimano C050 MegaRange	
CRANKSET	SR 42/34/24	
	Riveted	*Bolt hole circle, mm*
BB	Three-piece type	
	70 x 3NN, Square	*Shell x axle, mm*
CHAIN	KMC Z-51	
	3/32"	*Chain type*
	106	*Chain length (links)*
CASSETTE	HG72 13-34, 7spd	

WHEELSET

FRONT WHEEL	Alloy, nutted hub, 32°, Aluminum alloy rim	
	499	*E.R.D., mm*
	Rubber	*Rim strip*
REAR WHEEL	Alloy, nutted hub, 32°, Aluminum alloy rim	
	499	*E.R.D., mm*
	Rubber	*Rim strip*
FRONT TIRE	Cross tread	
	24 x 2.1	*Tire size*
REAR TIRE	Cross tread	
	24 x 2.1	*Tire size*
SPOKES	14G	
	242, 4x	*Front, mm*
	239/240, 4x	*Rear, mm*
INNER TUBES	Schraeder valve	

OTHER

SEATPOST	Steel	
	29.2	*Outer diameter, mm*
SADDLE	Fisher Padded	
BRAKES	Alloy direct pull, front	
	Alloy direct pull, rear	
PEDALS	Platform	
	9/16"	*Axle diameter*
SEAT BINDER	Quick release	
	31.8	*Inner diameter, mm*
ADDITIONALS	Chainring guard, kickstand, derailleur guard	

COLORS

Yellow/Black • Red decal (boys)
Blue/White • White decal (girls)

FIT

Frame	Size	13
Rider height	Inches	59.2
	Cm	150
Handlebar	Width, mm	560
Stem	Length, mm	85
	Angle	40
Crank	Length, mm	162.5
Seatpost	Length, mm	350
Steerer	Length, mm	126

FRAME AND FORK HIGHLIGHTS

Steel frame is tough and durable. Low standover allows more growth since it fits wider range of riders for longer use. The off-road geometry is stable in rough terrain. Fork is light and strong.

COMPONENTS HIGHLIGHTS

Wide-ratio gearing makes it easier to tackle any terrain. The size-specific parts fit smaller rider for improved comfort and control. Direct pull brakes provide the extra stopping power desired off-road.

WHEELSET HIGHLIGHTS

Alloy rims are light weight, provide improved braking action. The nutted hubs means secure wheel attachment for new rider. More spokes means stronger wheels. Tires are easy pedaling and fast, yet grippy.

GEARING

	24	34	42
13	44	62	76
15	38	54	66
17	33	47	58
19	30	42	52
22	26	37	45
25	23	32	40
28	20	29	35

BIKE WEIGHT (est.)

31.9 lb.
14.48 kg.

Mt Jam

RIDING STYLE....Rough-riding kid or athletic new rider

FRAMESET

MAIN TUBES .....Silver series aluminum
STAYS .....Silver series aluminum
6.8 lb. (3.10 kg.) — *Frame weight (estimated)*
FORK .....RST 191-CL
63 — *Travel, mm*
402.3 — *Axle-crown length, mm*
HEADSET .....Steel
25.4/34.0/30.0 — *Size*
36.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel
22.2 — *Clamp diameter, mm*
STEM .....Alloy adjustable rise, quick change, quill
Steerer clamp height, mm
SHIFT LEVERS .....SRAM MRX Plus
BRAKE LEVERS ....Alloy, direct pull
GRIPS .....Kraton

DRIVETRAIN

FT DERAILLEUR ...Shimano C050
Down pull — *Cable routing*
34.9 mm/ 1 3/8" — *Attachment*
RR DERAILLEUR ...Shimano Altus GS
CRANKSET .....SR 42/34/24
Riveted — *Bolt hole circle, mm*
BB .....Three-piece type
73 x 5GB, Square — *Shell x axle, mm*
CHAIN .....KMC Z-51
3/32" — *Chain type*
106 — *Chain length (links)*
CASSETTE HG72 13-34, 7spd

WHEELSET

FRONT WHEEL ....Alloy, nutted hub, 32°, Aluminum alloy rim
499 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Alloy, nutted hub, 32°, Aluminum alloy rim
499 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Cross tread
24 x 1.95 — *Tire size*
REAR TIRE .....Cross tread
24 x 1.95 — *Tire size*
SPOKES 14G
242, 4x — *Front, mm*
239/240, 4x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Alloy micro-adjust
29.2 — *Outer diameter, mm*
SADDLE .....Fisher Padded
BRAKES .....Alloy direct pull, front
Alloy direct pull, rear
PEDALS .....Alloy platform
9/16" — *Axle diameter*
SEAT BINDER .....Quick release
34.9 — *Inner diameter, mm*
ADDITIONALS .....1 water bottle mount, chainguard, kickstand

COLORS

Red/Silver • Silver decal

FRAME AND FORK HIGHLIGHTS

Silver series aluminum frame is light and strong. Low stand-over allows more growth since it fits wider range of riders for longer use. The off-road geometry is stable in rough terrain. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Wide-ratio gearing makes it easier to tackle any terrain. The size-specific parts fit smaller rider for improved comfort and control. Direct pull brakes provide the extra stopping power desired off-road.

WHEELSET HIGHLIGHTS

Alloy rims are light weight, provide improved braking action. The nutted hubs means secure wheel attachment for new rider. More spokes means stronger wheels. Tires are easy pedaling and fast, yet grippy.

FIT

Frame	Size	13
Rider height	Inches	58.8
	Cm	149
Handlebar	Width, mm	560
Stem	Length, mm	85
	Angle	40
Crank	Length, mm	162.5
Seatpost	Length, mm	350
Steerer	Length, mm	126

GEARING

	24	34	42
13	44	62	76
15	38	54	66
17	33	47	58
19	30	42	52
22	26	37	45
25	23	32	40
28	20	29	35

BIKE WEIGHT (est.)

29.7 lb.
13.48 kg.

Cosmo

RIDING STYLE.... Young dirt rider or First geared bike

FRAMESET

MAIN TUBES	Hi Tensile steel	
STAYS	Hi Tensile steel	
	4.0 lb. (1.80 kg.)	*Frame weight (estimated)*
FORK	RST 150E	
	50	*Travel, mm*
	356.5	*Axle-crown length, mm*
HEADSET	Steel	
	25.4/34.0/30.0	*Size*
	34.0	*Stack height, mm*

CONTROLS

HANDLEBAR	Steel	
	25.4	*Clamp diameter, mm*
STEM	Adjustable rise, quick change, quill	
		Steerer clamp height, mm
SHIFT LEVERS	SRAM MRX, right only	
BRAKE LEVERS	Alloy, direct pull	
GRIPS	Kraton	

DRIVETRAIN

RR DERAILLEUR	Shimano Tourney TY22	
CRANKSET	One-piece type, 32T	
	Riveted	*Bolt hole circle, mm*
BB	One-piece type	
	68,	*Shell x axle, mm*
CHAIN	KMC Z-51	
	3/32"	*Chain type*
	96	*Chain length (links)*
CASSETTE	HG60 14-28, 6spd	

WHEELSET

FRONT WHEEL	Alloy, nutted hub, 32°, Aluminum alloy rim	
	420	*E.R.D., mm*
	Rubber	*Rim strip*
REAR WHEEL	Alloy, nutted hub, 32°, Aluminum alloy rim	
	420	*E.R.D., mm*
	Rubber	*Rim strip*
FRONT TIRE	Cross tread	
	20 x 1.95	*Tire size*
REAR TIRE	Cross tread	
	20 x 1.95	*Tire size*
SPOKES	14G	
	192, 4x	*Front, mm*
	189/191, 4x	*Rear, mm*
INNER TUBES	Schraeder valve	

OTHER

SEATPOST	Steel	
	29.2	*Outer diameter, mm*
SADDLE	Fisher Padded	
BRAKES	Alloy direct pull, front	
	Alloy direct pull, rear	
PEDALS	Platform	
	1/2"	*Axle diameter*
SEAT BINDER	Quick release, 47mm	
		Inner diameter, mm
ADDITIONALS	Double chainring guards, kickstand, derailleur guard	

COLORS

Red/Silver • Silver decal (boys)
White/Purple • Purple decal (girls)

FRAME AND FORK HIGHLIGHTS

Steel frame is tough and durable. Low standover allows more growth since it fits wider range of riders for longer use. Suspension adds comfort by soaking up bumps, and better keeps the tire on the ground for steering and braking control.

COMPONENTS HIGHLIGHTS

Twist-type SRAM shifter with Shimano derailleur makes shifting easy. The size-specific parts fit smaller rider for improved comfort and control. Direct pull brakes provide the extra stopping power desired off-road.

WHEELSET HIGHLIGHTS

Alloy rims are light weight, provide improved braking action. The nutted hubs means secure wheel attachment for new rider. More spokes means stronger wheels. Tires are easy pedaling and fast, yet grippy.

FIT

Frame	Size	12B	12G
Rider height	Inches	54.4	54.4
	Cm	138	138
Handlebar	Width, mm	540	540
Stem	Length, mm	85	85
	Angle	40	40
Crank	Length, mm	140	140
Seatpost	Length, mm	300	300
Steerer	Length, mm	124.5	124.5

GEARING

	32
14	46
16	40
18	36
21	31
24	27
28	23

BIKE WEIGHT (est.)

26.0 lb.
11.80 kg.

Comet

RIDING STYLE ..... **Youth**

FRAMESET

MAIN TUBES .....Hi Tensile steel
STAYS .....Hi Tensile steel
4.0 lb. (1.80 kg.) — *Frame weight (estimated)*
FORK .....Hi Tensile steel
318 — *Axle-crown length, mm*
HEADSET .....Steel
22.2/30.0/27.0 — *Size*
33.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Steel BMX
22.2 — *Clamp diameter, mm*
STEM .....4 bolt BMX
BRAKE LEVERS ....Alloy, right only
GRIPS .....Fisher kid's

DRIVETRAIN

CRANKSET .....One-piece type, 36T
1 piece — *Bolt hole circle, mm*
BB VP-B33W
68, — *Shell x axle, mm*
CHAIN .....KMC 410
1/8" — *Chain type*
86 — *Chain length (links)*
CASSETTE 19

WHEELSET

FRONT WHEEL ....Steel hub, 36°, Aluminum alloy rim
420 — *E.R.D., mm*
Rubber — *Rim strip*
REAR WHEEL .....Coaster brake hub, 36°, Aluminum alloy rim
420 — *E.R.D., mm*
Rubber — *Rim strip*
FRONT TIRE .....Cross tread
20 x 1.95 — *Tire size*
REAR TIRE .....Cross tread
20 x 1.95 — *Tire size*
SPOKES 14G
188, 4x — *Front, mm*
185, 4x — *Rear, mm*
INNER TUBES .....Schraeder valve

OTHER

SEATPOST .....Steel
22.2 — *Outer diameter, mm*
SADDLE .....Padded
BRAKES .....Coaster with direct pull, rear
PEDALS .....Platform
1/2" — *Axle diameter*
SEAT BINDER .....Bolt, M6 x 30 (Boys)
Binder w/integral bolt (Girls)
25.4 — *Inner diameter, mm*
ADDITIONALS .....Chainguard, fenders, and pads on Boys; Chainguard, pads, tassles, and basket on Girls

COLORS

Red• Silver decal (boys)
White • Purple decal (girls)

FRAME AND FORK HIGHLIGHTS

Steel frame is tough and durable. Low standover allows more growth since it fits wider range of riders for longer use. Fork is light and strong.

COMPONENTS HIGHLIGHTS

Coaster brake with rear hand brake provides a stepping stone to hand controls on 'big' bikes. The size-specific parts fit smaller rider for improved comfort and control.

WHEELSET HIGHLIGHTS

Popular BMX styling Tires are easy pedaling and fast, yet grippy.

FIT

Frame	Size	12B	12G
Rider height	Inches	54.6	54.6
	Cm	139	139
Handlebar	Width, mm	550	550
Stem	Length, mm	50	50
	Angle	0	0
Crank	Length, mm	140	140
Seatpost	Length, mm	254	254
Steerer	Length, mm	124	124

GEARING

36
19 38

BIKE WEIGHT (est.)

26.0 lb.
11.80 kg.

Gamma Ray

RIDING STYLE ..... **Youth**

FRAMESET

MAIN TUBES	Hi Tensile steel	
STAYS	Hi Tensile steel	
	25.3 lb. (11.50 kg.)	*Frame weight (estimated)*
FORK	Hi Tensile steel	
	275	*Axle-crown length, mm*
HEADSET	Steel	
	22.2/30.0/27.0	*Size*
	35.5	*Stack height, mm*

CONTROLS

HANDLEBAR	Steel BMX, 130mm rise	
	25.4	*Clamp diameter, mm*
STEM	2 bolt BMX, alloy top	
GRIPS	Fisher kid's	

DRIVETRAIN

CRANKSET	One-piece type, 32T	
	1 piece	*Bolt hole circle, mm*
BB	One-piece type	
CHAIN	KMC 410	
	1/8"	*Chain type*
	74	*Chain length (links)*
CASSETTE	19	

WHEELSET

FRONT WHEEL	Steel hub, 28°, Steel rim	
	321	*E.R.D., mm*
	Rubber	*Rim strip*
REAR WHEEL	Coaster brake hub, 28°, Steel rim	
	321	*E.R.D., mm*
	Rubber	*Rim strip*
FRONT TIRE	Cross tread	
	16 x 1.75	*Tire size*
REAR TIRE	Cross tread	
	16 x 1.75	*Tire size*
SPOKES	14G	
	137, 2x	*Front, mm*
	133, 2x	*Rear, mm*
INNER TUBES	Schraeder valve	

OTHER

SEATPOST	Steel	
	22.2	*Outer diameter, mm*
SADDLE	Fisher Padded	
BRAKES	Coaster brake, rear	
PEDALS	Platform	
	1/2"	*Axle diameter*
SEAT BINDER	Bolt	
	26.0	*Inner diameter, mm*
ADDITIONALS	Training wheels, chainguard, fenders, pads on Boys Training wheels, chainguard, pads, tassles, and basket on Girls	

COLORS

Black • Silver decal (boys)
Purple • Pink decal (girls)

FRAME AND FORK HIGHLIGHTS

Steel frame is tough and durable. Low standover allows more growth since it fits wider range of riders for longer use. Fork is light and strong.

COMPONENTS HIGHLIGHTS

The size-specific parts fit smaller rider for improved comfort and control.

WHEELSET HIGHLIGHTS

BMX styling is popular with kids. More spokes means stronger wheels. Tires are easy pedaling and fast, yet grip-

FIT

Frame	Size	9B	9G
Rider height	Inches	46.2	46.2
	Cm	117	117
Handlebar	Width, mm	510	510
Stem	Length, mm	38	38
	Angle	0	0
Crank	Length, mm	115	115
Seatpost	Length, mm	254	254
Steerer	Length, mm	127	127

GEARING

32
19 26

BIKE WEIGHT (est.)

2.0 lb.
0.92 kg.

Sun Spot

RIDING STYLE ..... **Youth**

FRAMESET

MAIN TUBES	Hi Tensile steel	
STAYS	Hi Tensile steel	
	3.4 lb. (1.56 kg.)	*Frame weight (estimated)*
FORK	Hi Tensile steel	
	225	*Axle-crown length, mm*
HEADSET	Steel	
	22.2/30.0/27.0	*Size*
	35.5	*Stack height, mm*

CONTROLS

HANDLEBAR	BMX	
	25.4	*Clamp diameter, mm*
STEM	2 bolt BMX	
GRIPS	Fisher kid's	

DRIVETRAIN

CRANKSET	One-piece type, 28T	
	1 piece	*Bolt hole circle, mm*
BB	One-piece type	
	24 TPI,	*Shell x axle, mm*
CHAIN	KMC 410	
	1/8"	*Chain type*
	60	*Chain length (links)*
CASSETTE	19	

WHEELSET

FRONT WHEEL	Steel hub, 20°, Steel rim	
	220	*E.R.D., mm*
	Rubber	*Rim strip*
REAR WHEEL	Coaster brake hub, 20°, Steel rim	
	220	*E.R.D., mm*
	Rubber	*Rim strip*
FRONT TIRE	Cross tread	
	12.5 x 2.25	*Tire size*
REAR TIRE	Cross tread	
	12.5 x 2.25	*Tire size*
SPOKES	14G	
	86, 3x	*Front, mm*
	79, 3x	*Rear, mm*
INNER TUBES	Schraeder valve	

OTHER

SEATPOST	Steel	
	22.2	*Outer diameter, mm*
SADDLE	Padded	
BRAKES	Coaster, rear	
PEDALS	Platform	
	1/2"	*Axle diameter*
SEAT BINDER	Bolt, M6 x 30	
	26.0	*Inner diameter, mm*
ADDITIONALS	Training wheels, chainguard, fenders, and pads on Boys Training wheels, chainguard, pads, tassles, and basket on Girls	

COLORS

Blue• Silver decal (boys)
Pink • Purple decal (girls)

FRAME AND FORK HIGHLIGHTS

Steel frame is tough and durable. Low standover allows more growth since it fits wider range of riders for longer use. Fork is light and strong.

COMPONENTS HIGHLIGHTS

Coaster brakes use stronger leg muscles to control speed. The size-specific parts fit smaller rider for improved comfort and control.

WHEELSET HIGHLIGHTS

BMX styling is popular with kids. More spokes means stronger wheels. Tires are easy pedaling and fast, yet grippy.

FIT

Frame	Size	8B	8G
Rider height	Inches	40.7	40.7
	Cm	103	103
Handlebar	Width, mm	480	480
Stem	Length, mm	38	38
	Angle	0	0
Crank	Length, mm	92	92
Seatpost	Length, mm	254	254
Steerer	Length, mm	122	122

GEARING

28
19 17

BIKE WEIGHT (est.)

20.9 lb.
9.49 kg.

LEMOND TI ROAD

For 2003

Since their introduction in 2001, the LeMond titanium frames have grown into a full line featuring three frame designs: Plain gauge, Custom double-butted, and mixed Ti/Carbon.

The all-new Tete de Course blends titanium with carbon fiber. For more information on this new frame, see *Mixed Materials: Titanium and Carbon* on pages 40 and 41.

	Frame sizes	49	51	53	55	57	59	61
	Head angle	72.0	72.5	73.0	73.5	73.5	74.0	74.0
	Seat angle	74.0	73.8	73.3	73.0	72.5	72.5	72.0
MILLIMETERS	Standover	752	754	772	790	808	831	848
	Seat tube	517	537	557	576	596	616	636
	Head tube	102	117	134	151	169	191	209
	Eff top tube	519	532	545	565	576	591	606
	Chainstays	412	415	415	415	415	417	417
	BB height	266	266	266	266	266	270	270
	Offset	47	47	47	45	45	43	43
	Trail	61	58	55	54	54	53	53
	Wheelbase	967	980	984	995	1000	1013	1021
INCHES	Standover	29.6	29.7	30.4	31.1	31.8	32.7	33.4
	Seat tube	20.3	21.1	21.9	22.7	23.5	24.3	25.0
	Head tube	4.0	4.6	5.3	5.9	6.7	7.5	8.2
	Eff top tube	20.4	20.9	21.5	22.3	22.7	23.3	23.9
	Chainstays	16.2	16.3	16.3	16.3	16.3	16.4	16.4
	BB height	10.5	10.5	10.5	10.5	10.5	10.6	10.6
	Offset	1.9	1.9	1.9	1.8	1.8	1.7	1.7
	Trail	2.4	2.3	2.1	2.1	2.1	2.1	2.1
	Wheelbase	38.1	38.6	38.7	39.2	39.4	39.9	40.2

Geometry

The titanium LeMond models use Greg's proven geometry, like all LeMond models. These bikes ride really, really well, so we've used the same geometry centerlines for all of them.

Ride

We did a lot of research and development to tune the rides of these bikes. The results are amazing riding bikes, unlike any other Titanium bikes on the market.

As a group, the LeMond titanium models are quick to accelerate, and feel lively underneath you like the best of the competitors.

However, the LeMond titanium models are firm to the pedal when standing on a climb, not whippy like some Ti bikes.

And even though they sprint great, LeMond geometry gives these bikes a ride which is amazingly comfortable, not harsh in the saddle like other Ti bikes can be.

Frame details

All LeMond road bikes have 2 water bottle mounts.

The seat tube of our Ti bikes uses a composite internal sleeve to prevent galvanic corrosion of the seatpost to the frame. Do not grease the seatpost, or the seatpost clamp may not provide adequate clamping force.

Special parts

Seat collar 992562
Derailleur hanger 990116

Tete de Course

RIDING STYLE ..... **Racer**

FRAMESET

MAIN TUBES .....OCLV 110/ Reynolds butted 3/2.5 titanium
STAYS .....OCLV 110/ Reynolds butted 3/2.5 titanium
3.1 lb. (1.41 kg.) — Frame weight (estimated)
FORK .....Reynolds Ouzo Pro
371 — Axle-crown length, mm
HEADSET .....Cane Creek S-6 Aheadset, alloy
25.4/34.0/30.0 — Size
27.1 — Stack height, mm

CONTROLS

HANDLEBAR .....3TTT Zepp XL
31.75 — Clamp diameter, mm
STEM .....3TTT Zepp XL
34.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Dura-Ace STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Dura-Ace
Down pull — Cable routing
Braze-on type w/31.8mm clamp — Attachment
RR DERAILLEUR ...Shimano Dura-Ace
CRANKSET .....Shimano Dura-Ace 53/39
130 — Bolt hole circle, mm
BB .....Shimano Ultegra
68 x 109.5, Splined, Shimano — Shell x axle, mm
CHAIN .....Shimano Dura-Ace
9 speed — Chain type
108 — Chain length (links)
CASSETTE .....Shimano Dura-Ace 12-23, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Race X Lite, 20°
592 — E.R.D., mm
Velox 16mm — Rim strip
REAR WHEEL .....Bontrager Race X Lite, 24°
595 — E.R.D., mm
Velox 16mm — Rim strip
FRONT TIRE .....Bontrager Race X Lite, folding
700 x 23c — Tire size
REAR TIRE .....Bontrager Race X Lite, folding
700 x 23c — Tire size
SPOKES .....DT Revolution Aero 14/17G (New Aero drive side rear), ProLock alloy nipples
278, Radial — Front, mm
291/291, 2x — Rear, mm
INNER TUBES .....Presta valve, 48mm stem

OTHER

SEATPOST .....Thomson Elite
27.2 — Outer diameter, mm
SADDLE .....SSM Aspide, Ti/leather
BRAKES .....Shimano Dura-Ace
PEDALS .....-not supplied-
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral bolt
31.9 — Inner diameter, mm
ADDITIONALS .....2 water bottle mounts (1 bottle on 49), pump peg (not on 49, 51)

COLORS

Brushed Titanium / Black • Red decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry-classic positioning, ride and handling developed by Greg at the front of the European peloton. 3/2.5 titanium shaped and butted spine (head tube, down tube, and chainstays) for titanium feel mated to OCLV 110 upper (top tube, seat tube, and seat stays) for reduced weight. Fork has carbon blades, crown, and steerer for low weight, super ride.

COMPONENTS HIGHLIGHTS

Shimano Dura-Ace equipped like the Pros. Includes stiff and light oversize 3T bar and stem.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels- engineered for low maintenance, high performance. Extremely light DT Revolution Aero spokes and alloy nipples mean low weight for quick acceleration. Tires have silica-based tread compound for low rolling resistance and extra wet traction. Ultra-round profile for smooth cornering, 4-layer casing for puncture resistance. High thread count for low weight, high strength. Top German quality tire.

FIT

Frame	Size	48	51	53	55	57	59	61
Rider height	Inches	66.9	68.4	70.4	72.3	73.6	75.3	77.3
	Cm	170	174	179	184	187	191	196
Handlebar	Width, mm	420	440	440	460	460	460	460
Stem	Length, mm	90	100	110	110	120	120	130
	Angle	10	10	10	10	10	10	10
Crank	Length, mm	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	330	330	330	330	330	330	330
Steerer	Length, mm	180.0	195.0	212.0	229.0	247.0	269.0	287.0

GEARING

	39	53
12	86	117
13	79	108
14	74	100
15	69	93
16	64	88
17	61	82
19	54	74
21	49	67
23	45	61

BIKE WEIGHT (est.)

16.7 lb.
7.58 kg.

Le Victoire

RIDING STYLE.....Racer

FRAMESET

MAIN TUBES .....Reynolds titanium, double butted
STAYS .....Reynolds titanium, tapered
3.1 lb. (1.41 kg.) — Frame weight (estimated)
FORK .....Bontrager Race Lite
371 — Axle-crown length, mm
HEADSET .....LeMond internal
25.4/34.0/30.0 — Size
8.0 — Stack height, mm

CONTROLS

HANDLEBAR .....3TTT Forgie XL
31.75 — Clamp diameter, mm
STEM .....3TTT Forgie XL
41.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Ultegra STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Ultegra
Down pull — Cable routing
31.8 mm/ 1 1/4" — Attachment
RR DERAILLEUR ...Shimano Ultegra
CRANKSET .....Shimano Ultegra 53/39
130 — Bolt hole circle, mm
BB .....Shimano Ultegra
68 x 109.5, Splined, Shimano — Shell x axle, mm
CHAIN .....Shimano HG-92
9 speed — Chain type
108 — Chain length (links)
CASSETTE .....Shimano Ultegra 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Race Lite Road, 20°
592 — E.R.D., mm
Velox 16mm — Rim strip
REAR WHEEL .....Bontrager Race Lite Road, 24°
595 — E.R.D., mm
Velox 16mm — Rim strip
FRONT TIRE .....Bontrager Race X Lite, folding
700 x 23c — Tire size
REAR TIRE .....Bontrager Race X Lite, folding
700 x 23c — Tire size
SPOKES .....DT New Aero, ProLock alloy nipples
279, Radial — Front, mm
291/291, 2x — Rear, mm
INNER TUBES .....Presta valve, 48mm stem

OTHER

SEATPOST .....LeMond
27.2 — Outer diameter, mm
SADDLE .....SSM Era Luxe, Cro-Moly/leather
BRAKES .....Shimano Ultegra
PEDALS .....-not supplied-
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral bolt
31.9 — Inner diameter, mm
ADDITIONALS .....2 water bottle mounts (1 bottle on 49), pump peg (not on 49, 51)

COLORS

Metallic Blue / White panel • Blue decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry-classic positioning, ride and handling developed by Greg at the front of the European peloton. Full 3/2.5 titanium tubeset without any shortcuts- butted, tapered, shaped, and swaged tubing. Fork has OCLV 110 blades for low weight, high strength. Alloy steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. PSD (Paired Spoke Design) makes a high strength structure that stays true, and the low spoke count reduces aerodynamic drag. Quality DT New Aero spokes with alloy nipples make a low weight wheel that slices the wind. Tires have silica-based tread compound for low rolling resistance and extra wet traction. Ultra-round profile for smooth cornering. 4-layer casing for puncture resistance. High thread count for low weight, high strength. Top German quality tire.

FIT

Frame	Size	49	51	53	55	57	59	61
Rider height	Inches	66.3	68.4	70.4	72.2	73.5	75.2	77.2
	Cm	168	174	179	183	187	191	196
Handlebar	Width, mm	420	440	440	460	460	460	460
Stem	Length, mm	90	100	110	110	120	120	130
	Angle	10	10	10	10	10	10	10
Crank	Length, mm	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250
Steerer	Length, mm	187.0	202.0	219.0	236.0	254.0	276.0	294.0

GEARING

	39	53
12	86	117
13	79	108
14	74	100
15	69	93
17	61	82
19	54	74
21	49	67
23	45	61
25	41	56

BIKE WEIGHT (est.)

18.5 lb.
8.40 kg.

Le Victoire T

RIDING STYLE ..... **Racer**

FRAMESET

MAIN TUBES ..... Reynolds titanium, double butted
STAYS ..... Reynolds titanium, tapered
3.1 lb. (1.41 kg.) — *Frame weight (estimated)*
FORK ..... Bontrager Race Lite
371 — *Axle-crown length, mm*
HEADSET ..... LeMond internal
25.4/34.0/30.0 — *Size*
8.0 — *Stack height, mm*

CONTROLS

HANDLEBAR ..... 3TTT Forgie XL
31.75 — *Clamp diameter, mm*
STEM ..... 3TTT Forgie XL
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS ..... Shimano Ultegra STI, Flite Deck compatible
BRAKE LEVERS .... Integrated brake/shift
GRIPS ..... Powercork

DRIVETRAIN

FT DERAILLEUR ... Shimano Ultegra T
Down pull — *Cable routing*
Braze-on type w/31.8mm clamp — *Attachment*
RR DERAILLEUR ... Shimano Ultegra GS
CRANKSET ..... Shimano Ultegra 52/42/30
74/130 — *Bolt hole circle, mm*
BB ..... Shimano Ultegra
68 x 118, Splined, Shimano — *Shell x axle, mm*
CHAIN ..... Shimano HG-92
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE ..... Shimano Ultegra 12-25, 9spd

WHEELSET

FRONT WHEEL .... Bontrager Race Lite Road, 20°
592 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL ..... Bontrager Race Lite Road, 24°
595 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE ..... Bontrager Race X Lite, folding
700 x 23c — *Tire size*
REAR TIRE ..... Bontrager Race X Lite, folding
700 x 23c — *Tire size*
SPOKES ..... DT New Aero, ProLock alloy nipples
279, Radial — *Front, mm*
291/291, 2x — *Rear, mm*
INNER TUBES ..... Presta valve, 48mm stem

OTHER

SEATPOST ..... LeMond
27.2 — *Outer diameter, mm*
SADDLE ..... SSM Era Luxe, Cro-Moly/leather
BRAKES ..... Shimano Ultegra
PEDALS ..... -not supplied-
9/16" — *Axle diameter*
SEAT BINDER ..... Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS ..... 2 water bottle mounts (1 bottle on 49), pump peg (not on 49, 51)

COLORS

Metallic Blue / White panel • Blue decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry-classic positioning, ride and handling developed by Greg at the front of the European peloton. Full 3/2.5 titanium tubeset without any shortcuts- butted, tapered, shaped, and swaged tubing. Fork has OCLV 110 blades for low weight, high strength. Alloy steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. PSD (Paired Spoke Design) makes a high strength structure that stays true, and the low spoke count reduces aerodynamic drag. Quality DT New Aero spokes with alloy nipples make a low weight wheel that slices the wind. Tires have silica-based tread compound for low rolling resistance and extra wet traction. Ultra-round profile for smooth cornering. 4-layer casing for puncture resistance. High thread count for low weight, high strength. Top German quality tire.

FIT

Frame	Size	49	51	53	55	57	59	61
Rider height	Inches	66.3	68.4	70.4	72.2	73.5	75.2	77.2
	Cm	168	174	179	183	187	191	196
Handlebar	Width, mm	420	440	440	460	460	460	460
Stem	Length, mm	90	100	110	110	120	120	130
	Angle	10	10	10	10	10	10	10
Crank	Length, mm	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250
Steerer	Length, mm	187.0	202.0	219.0	236.0	254.0	276.0	294.0

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

18.8 lb.
8.54 kg.

Arrivee T

RIDING STYLE.....Racer

FRAMESET

MAIN TUBES .....LeMond 3/2.5 titanium
STAYS .....Reynolds titanium, tapered
3.1 lb. (1.41 kg.) — Frame weight (estimated)
FORK .....Bontrager Race
370.0 — Axle-crown length, mm
HEADSET .....Cane Creek C-1 Aheadset
25.4/34.0/30.0 — Size
26.7 — Stack height, mm

CONTROLS

HANDLEBAR .....3TTT The
26.0 — Clamp diameter, mm
STEM .....3TTT The
40.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Ultegra STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano 105 T
Down pull — Cable routing
31.8 mm/ 1 1/4" — Attachment
RR DERAILLEUR ...Shimano Ultegra GS
CRANKSET .....Shimano Ultegra 52/42/30
74/130 — Bolt hole circle, mm
BB .....Shimano 105
68 x 118, Splined, Shimano — Shell x axle, mm
CHAIN .....Shimano HG-53
9 speed — Chain type
108 — Chain length (links)
CASSETTE .....Shimano HG70 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Select Road, 20°
592 — E.R.D., mm
Velox 16mm — Rim strip
REAR WHEEL .....Bontrager Select Road, 24°
603 — E.R.D., mm
Velox 16mm — Rim strip
FRONT TIRE .....Bontrager Race Lite
700 x 25c — Tire size
REAR TIRE .....Bontrager Race Lite
700 x 25c — Tire size
SPOKES .....DT 14/15G butted stainless
278, Radial — Front, mm
293/294, 2x — Rear, mm
INNER TUBES .....Presta valve, 48mm stem

OTHER

SEATPOST .....LeMond
27.2 — Outer diameter, mm
SADDLE .....SSM Era Luxe, Cro-Moly/leather
BRAKES .....Shimano Ultegra
PEDALS .....Shimano SPD M515, clipless
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral bolt
31.9 — Inner diameter, mm
ADDITIONALS .....2 water bottle mounts (1 bottle on 49), pump peg (not on 49, 51)

COLORS

Yellow Metallic / Red panel • White decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry-classic positioning, ride and handling developed by Greg at the front of the European peloton. Full 3/2.5 titanium tubeset for classic titanium feel, durability, and low weight.
Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. They use butted spokes for stronger wheels and lower weight. Tires have natural carbon rubber tread for long tread life. Ultra-round profile for smooth cornering. 3-layer casing for puncture resistance. Folding bead reduces weight.

FIT

Frame	Size	49	51	53	55	57	59	61
Rider height	Inches	65.6	68.5	69.2	72.2	72.7	75.3	77.8
	Cm	167	174	176	184	185	191	198
Handlebar	Width, mm	420	440	440	460	460	460	460
Stem	Length, mm	80	100	100	110	110	120	135
	Angle	12	12	12	12	12	12	12
Crank	Length, mm	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250
Steerer	Length, mm	187.7	202.7	218.7	235.2	253.7	277.7	297.7

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

18.5 lb.
8.40 kg.

REYNOLDS 853 ROAD

New for 2003

We first built a Reynolds 853 LeMond in 1996. These frames are very similar, but improved. In 2002, we have made slight changes in the tube designs to further tweak the great ride. See *"LeMond Steel"* on pages 35-36.

Geometry

The 853 LeMond models use Greg's proven geometry, like all LeMond models. See *"LeMond Geometry"* on pages 33-34.

Ride

Steel is famous for two things: durability and ride quality. Combined with Greg's geometry, these bikes give an awesome ride. It's no wonder the Zurich has been our most popular model.

The outstanding ride qualities of these frames are a smooth, comfortable ride and a wonderful balance and stable feeling. They are very predictable in corners, even allowing a rider to 'push' the bike around a turn. These qualities make the steel LeMond bikes particularly fine bikes for smaller riders, although we know lots of big riders who swear by the feel of steel.

Frame details

All LeMond road bikes have 2 water bottle mounts.

Special parts

Seat collar 992562
Derailleur hanger 990116

	Frame sizes	45	49	53
	Head angle	71.0	72.0	72.5
	Seat angle	75.0	74.5	73.8
MILLIMETERS	Standover	725	756	784
	Seat tube	477	517	554
	Head tube	85	100	116
	Eff top tube	498	510	530
	Chainstays	412	415	415
	BB height	266	266	266
	Offset	47.0	47.0	47.0
	Trail	67	61	58
	Wheelbase	968	970	979
INCHES	Standover	28.5	29.8	30.9
	Seat tube	18.8	20.3	21.8
	Head tube	3.3	3.9	4.6
	Eff top tube	19.6	20.1	20.9
	Chainstays	16.2	16.3	16.3
	BB height	10.5	10.5	10.5
	Offset	1.9	1.9	1.9
	Trail	2.6	2.4	2.3
	Wheelbase	38.1	38.2	38.5

	Frame sizes	49	51	53	55	57	59	61
	Head angle	72.0	72.5	73.0	73.5	73.5	74.0	74.0
	Seat angle	74.0	73.8	73.3	73.0	72.5	72.5	72.0
MILLIMETERS	Standover	752	754	772	790	808	831	848
	Seat tube	517	537	557	576	596	616	636
	Head tube	85	100	116	133	151	175	195
	Eff top tube	519	532	545	565	576	591	606
	Chainstays	412	415	415	415	415	417	417
	BB height	266	266	266	266	266	270	270
	Offset	47	47	47	45	45	43	43
	Trail	61	58	55	54	54	53	53
	Wheelbase	967	980	984	995	1000	1013	1021
INCHES	Standover	29.6	29.7	30.4	31.1	31.8	32.7	33.4
	Seat tube	20.3	21.1	21.9	22.7	23.5	24.3	25.0
	Head tube	3.3	3.9	4.6	5.2	5.9	6.9	7.7
	Eff top tube	20.4	20.9	21.5	22.3	22.7	23.3	23.9
	Chainstays	16.2	16.3	16.3	16.3	16.3	16.4	16.4
	BB height	10.5	10.5	10.5	10.5	10.5	10.6	10.6
	Offset	1.9	1.9	1.9	1.8	1.8	1.7	1.7
	Trail	2.4	2.3	2.1	2.1	2.1	2.1	2.1
	Wheelbase	38.1	38.6	38.7	39.2	39.4	39.9	40.2

Maillot Jaune

RIDING STYLE ..... **Racer**

FRAMESET

MAIN TUBES ..... Reynolds 853 Pro
STAYS ..... Reynolds 725
3.3 lb. (1.50 kg.) — *Frame weight (estimated)*
FORK ..... Bontrager Race Lite
370 — *Axle-crown length, mm*
HEADSET ..... Cane Creek S-6 Aheadset, alloy
25.4/34.0/30.0 — *Size*
27.1 — *Stack height, mm*

CONTROLS

HANDLEBAR ..... 3TTT Forgie XL
31.75 — *Clamp diameter, mm*
STEM ..... 3TTT Forgie XL
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS ..... Shimano Dura-Ace STI, Flite Deck compatible
BRAKE LEVERS .... Integrated brake/shift
GRIPS ..... Powercork

DRIVETRAIN

FT DERAILLEUR ... Shimano Dura-Ace
Down pull — *Cable routing*
Braze-on type w/31.8mm clamp — *Attachment*
RR DERAILLEUR ... Shimano Dura-Ace
CRANKSET ..... Shimano Dura-Ace 53/39
130 — *Bolt hole circle, mm*
BB ..... Shimano Ultegra
68 x 109.5, Splined, Shimano — *Shell x axle, mm*
CHAIN ..... Shimano Dura-Ace
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE ..... Shimano Dura-Ace 12-23, 9spd

WHEELSET

FRONT WHEEL .... Bontrager Race Lite Road, 20°
592 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL ..... Bontrager Race Lite Road, 24°
595 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE ..... Bontrager Race X Lite, folding
700 x 23c — *Tire size*
REAR TIRE ..... Bontrager Race X Lite, folding
700 x 23c — *Tire size*
SPOKES ..... DT New Aero, ProLock alloy nipples
279, Radial — *Front, mm*
291/291, 2x — *Rear, mm*
INNER TUBES ..... Presta valve, 48mm stem

OTHER

SEATPOST ..... LeMond
27.2 — *Outer diameter, mm*
SADDLE ..... SSM Aspide, Ti/leather
BRAKES ..... Shimano Dura-Ace
PEDALS ..... -not supplied-
9/16" — *Axle diameter*
SEAT BINDER ..... Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS ..... 2 water bottle mounts (1 bottle on 49), pump peg (not on 49, 51)

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Pro tubeset- custom tube shapes, diameters, and butting maximize the LeMond feel.
Fork has OCLV 110 blades for low weight, high strength. Alloy steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Shimano Dura-Ace equipped like the Pros. Includes stiff and light oversize 3T bar and stem.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. PSD (Paired Spoke Design) makes a high strength structure that stays true, and the low spoke count reduces aerodynamic drag. Quality DT New Aero spokes with alloy nipples make a low weight wheel that slices the wind. Tires have silica-based tread compound for low rolling resistance and extra wet traction. Ultra-round profile for smooth cornering. 4-layer casing for puncture resistance. High thread count for low weight, high strength. Top German quality tire.

FIT

Frame	Size	49	51	53	55	57	59	61
Rider height	Inches	67.2	68.4	69.2	72.2	72.7	75.3	77.4
	Cm	171	174	176	183	185	191	197
Handlebar	Width, mm	420	440	440	460	460	460	460
Stem	Length, mm	100	100	100	110	110	120	130
	Angle	10	10	10	10	10	10	10
Crank	Length, mm	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250
Steerer	Length, mm	189.1	204.1	220.1	236.6	255.1	279.1	299.1

GEARING

	39	53
12	86	117
13	79	108
14	74	100
15	69	93
16	64	88
17	61	82
19	54	74
21	49	67
23	45	61

BIKE WEIGHT (est.)

17.1 lb.
7.76 kg.

Zurich

RIDING STYLE ..... **Racer**

FRAMESET

MAIN TUBES .....Reynolds 853 Pro
STAYS .....Reynolds 725
3.3 lb. (1.50 kg.) *Frame weight (estimated)*
FORK .....Bontrager Race Lite
371 *Axle-crown length, mm*
HEADSET .....Cane Creek S-2 Aheadset, alloy
25.4/34.0/30.0 *Size*
26.5 *Stack height, mm*

CONTROLS

HANDLEBAR .....3TTT Forgie XL
31.75 *Clamp diameter, mm*
STEM .....3TTT Forgie XL
41.0 *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Ultegra STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Ultegra
Down pull *Cable routing*
31.8 mm/ 1 1/4" *Attachment*
RR DERAILLEUR ...Shimano Ultegra
CRANKSET .....Shimano Ultegra 53/39
130 *Bolt hole circle, mm*
BB .....Shimano Ultegra
68 x 109.5, Splined, Shimano *Shell x axle, mm*
CHAIN .....Shimano HG-92
9 speed *Chain type*
108 *Chain length (links)*
CASSETTE .....Shimano Ultegra 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Race Lite Road, 20°
592 *E.R.D., mm*
Velox 16mm *Rim strip*
REAR WHEEL .....Bontrager Race Lite Road, 24°
595 *E.R.D., mm*
Velox 16mm *Rim strip*
FRONT TIRE .....Bontrager Race X Lite, folding
700 x 23c *Tire size*
REAR TIRE .....Bontrager Race X Lite, folding
700 x 23c *Tire size*
SPOKES .....DT New Aero, ProLock alloy nipples
279, Radial *Front, mm*
291/291, 2x *Rear, mm*
INNER TUBES .....Presta valve, 48mm stem

OTHER

SEATPOST .....LeMond
27.2 *Outer diameter, mm*
SADDLE .....SSM Era Luxe, Cro-Moly/leather
BRAKES .....Shimano Ultegra
PEDALS .....-not supplied-
9/16" *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51)

COLORS

Black Metallic / Red panel • Silver decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Pro tubeset- custom tube shapes, diameters, and butting maximize the LeMond feel.
Fork has OCLV 110 blades for low weight, high strength. Alloy steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem. Leather saddle for comfort and durability.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. PSD (Paired Spoke Design) makes a high strength structure that stays true, and the low spoke count reduces aerodynamic drag. Quality DT New Aero spokes with alloy nipples make a low weight wheel that slices the wind. Tires have silica-based tread compound for low rolling resistance and extra wet traction. Ultra-round profile for smooth cornering. 4-layer casing for puncture resistance. High thread count for low weight, high strength. Top German quality tire.

GEARING

	39	53
12	86	117
13	79	108
14	74	100
15	69	93
17	61	82
19	54	74
21	49	67
23	45	61
25	41	56

BIKE WEIGHT (est.)

19.0 lb.
8.63 kg.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	66.0	66.4	68.5	69.2	72.2	72.7	75.3	77.4
	Cm	168	169	174	176	183	185	191	197
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	90	90	100	100	110	110	120	130
	Angle	10	10	10	10	10	10	10	10
Crank	Length, mm	170	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	188.5	188.5	203.5	219.5	236.0	254.5	278.5	298.5

Zurich T

RIDING STYLE.....Racer or fast Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Pro
STAYS .....Reynolds 725
3.3 lb. (1.50 kg.) — Frame weight (estimated)
FORK .....Bontrager Race Lite
371 — Axle-crown length, mm
HEADSET .....Cane Creek S-2 Aheadset, alloy
25.4/34.0/30.0 — Size
26.5 — Stack height, mm

CONTROLS

HANDLEBAR .....3TTT Forgie XL
31.75 — Clamp diameter, mm
STEM .....3TTT Forgie XL
41.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Ultegra STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Ultegra T
Down pull — Cable routing
Braze-on type w/31.8mm clamp — Attachment
RR DERAILLEUR ...Shimano Ultegra GS
CRANKSET .....Shimano Ultegra 52/42/30
74/130 — Bolt hole circle, mm
BB .....Shimano Ultegra
68 x 118, Splined, Shimano — Shell x axle, mm
CHAIN .....Shimano HG-92
9 speed — Chain type
108 — Chain length (links)
CASSETTE .....Shimano Ultegra 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Race Lite Road, 20°
592 — E.R.D., mm
Velox 16mm — Rim strip
REAR WHEEL .....Bontrager Race Lite Road, 24°
595 — E.R.D., mm
Velox 16mm — Rim strip
FRONT TIRE .....Bontrager Race X Lite, folding
700 x 23c — Tire size
REAR TIRE .....Bontrager Race X Lite, folding
700 x 23c — Tire size
SPOKES .....DT New Aero, ProLock alloy nipples
279, Radial — Front, mm
291/291, 2x — Rear, mm
INNER TUBES .....Presta valve, 48mm stem

OTHER

SEATPOST .....LeMond
27.2 — Outer diameter, mm
SADDLE .....SSM Era Luxe, Cro-Moly/leather
BRAKES .....Shimano Ultegra
PEDALS .....-not supplied-
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral bolt
31.9 — Inner diameter, mm
ADDITIONALS .....2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51)

COLORS

Black Metallic / Red panel • Silver decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Pro tubeset-custom tube shapes, diameters, and butting maximize the LeMond feel. Fork has OCLV 110 blades for low weight, high strength. Alloy steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem. Leather saddle for comfort and durability.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. PSD (Paired Spoke Design) makes a high strength structure that stays true, and the low spoke count reduces aerodynamic drag. Quality DT New Aero spokes with alloy nipples make a low weight wheel that slices the wind. Tires have silica-based tread compound for low rolling resistance and extra wet traction. Ultra-round profile for smooth cornering. 4-layer casing for puncture resistance. High thread count for low weight, high strength. Top German quality tire.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	66.0	66.4	68.5	69.2	72.2	72.7	75.3	77.4
	Cm	168	169	174	176	183	185	191	197
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	90	90	100	100	110	110	120	130
	Angle	10	10	10	10	10	10	10	10
Crank	Length, mm	170	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	188.5	188.5	203.5	219.5	236.0	254.5	278.5	298.5

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

19.3 lb.
8.76 kg.

Zurich T women's

RIDING STYLE.....Woman Racer or fast Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Pro
STAYS .....Reynolds 525
3.3 lb. (1.5 kg.) *Frame weight (estimated)*
FORK .....Bontrager Race Lite
371 *Axle-crown length, mm*
HEADSET .....Cane Creek S-2 Aheadset
25.4/34.0/30.0 *Size*
26.5 *Stack height, mm*

CONTROLS

HANDLEBAR .....3TTT Forgie XL
31.75 *Clamp diameter, mm*
STEM .....3TTT Forgie XL
41.0 *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Ultegra STI, adjustable reach
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Ultegra T
Down pull *Cable routing*
Braze-on type w/31.8mm clamp *Attachment*
RR DERAILLEUR ...Shimano Ultegra GS
CRANKSET .....Shimano Ultegra 52/42/30
74/130 *Bolt hole circle, mm*
BB .....Shimano Ultegra
68 x 118, Splined, Shimano *Shell x axle, mm*
CHAIN .....Shimano HG-92
9 speed *Chain type*
108 *Chain length (links)*
CASSETTE .....Shimano Ultegra 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Race Lite Road, 20°
592 *E.R.D., mm*
Velox 16mm *Rim strip*
REAR WHEEL .....Bontrager Race Lite Road, 24°
595 *E.R.D., mm*
Velox 16mm *Rim strip*
FRONT TIRE .....Bontrager Race X Lite, folding
700 x 23c *Tire size*
REAR TIRE .....Bontrager Race X Lite, folding
700 x 23c *Tire size*
SPOKES .....DT New Aero, ProLock alloy nipples
279, Radial *Front, mm*
291/291, 2x *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....LeMond
27.2 *Outer diameter, mm*
SADDLE .....Oasis women's, leather/Cro-Moly
BRAKES .....Shimano Ultegra
PEDALS .....-not supplied-
9/16" *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts

COLORS

Light Red Metallic / White panel • Pink decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Pro tubeset- custom tube shapes, diameters, and butting maximize the LeMond feel. Greg's classic positioning, ride and handling design adapted for a woman's ergonomics. Fork has OCLV 110 blades for low weight, high strength. Alloy steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem. Leather saddle for comfort and durability. Size specific cranks, bars, and saddle to fit a woman.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. PSD (Paired Spoke Design) makes a high strength structure that stays true, and the low spoke count reduces aerodynamic drag. Quality DT New Aero spokes with alloy nipples make a low weight wheel that slices the wind. Tires have silica-based tread compound for low rolling resistance and extra wet traction. Ultra-round profile for smooth cornering. 4-layer casing for puncture resistance. High thread count for low weight, high strength. Top German quality tire.

FIT

Frame	Size	45	49	53
Rider height	Inches	65.0	66.1	68.4
	Cm	165	168	174
Handlebar	Width, mm	420	420	420
Stem	Length, mm	90	90	100
	Angle	10	10	10
Crank	Length, mm	165	165	170
Seatpost	Length, mm	250	250	250
Steerer	Length, mm	188.5	203.5	219.5

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

19.1 lb.
8.67 kg.

Buenos Aires

RIDING STYLE.....Racer or fast Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select
STAYS .....Reynolds 525
3.7 lb. (1.68 kg.) — Frame weight (estimated)
FORK .....Bontrager Race
371 — Axle-crown length, mm
HEADSET .....Cane Creek C-1 Aheadset
25.4/34.0/30.0 — Size
26.7 — Stack height, mm

CONTROLS

HANDLEBAR .....3TTT The
26.0 — Clamp diameter, mm
STEM .....3TTT The
40.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Ultegra STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano 105
Down pull — Cable routing
31.8 mm/ 1 1/4" — Attachment
RR DERAILLEUR ...Shimano Ultegra
CRANKSET .....Shimano Ultegra 53/39
130 — Bolt hole circle, mm
BB .....Shimano 105
68 x 109.5, Splined, Shimano — Shell x axle, mm
CHAIN .....Shimano HG-53
9 speed — Chain type
108 — Chain length (links)
CASSETTE .....Shimano HG70 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Select Road, 20°
592 — E.R.D., mm
Velox 16mm — Rim strip
REAR WHEEL .....Bontrager Select Road, 32°
603 — E.R.D., mm
Velox 16mm — Rim strip
FRONT TIRE .....Bontrager Race Lite
700 x 25c — Tire size
REAR TIRE .....Bontrager Race Lite
700 x 25c — Tire size
SPOKES .....DT 14/15G butted stainless
278, Radial — Front, mm
293/294, 2x — Rear, mm
INNER TUBES .....Presta valve, 48mm stem

OTHER

SEATPOST .....LeMond
27.2 — Outer diameter, mm
SADDLE .....CRZ+ Road, Cro-Moly rails
BRAKES .....Shimano Ultegra
PEDALS .....Shimano SPD M515, clipless
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral bolt
31.9 — Inner diameter, mm
ADDITIONALS .....2 water bottle mounts (1 bottle on 49), pump peg (not on 49, 51)

COLORS

Prime Blue / Yellow Metallic panel • Blue decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select tube-set- steel feel and durability, very low weight. Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. They use butted spokes for stronger wheels and lower weight. Tires have natural carbon rubber tread for long tread life. Ultra-round profile for smooth cornering. 3-layer casing for puncture resistance. Folding bead reduces weight.

FIT

Frame	Size	49	51	53	55	57	59	61
Rider height	Inches	65.5	68.5	69.3	72.3	72.8	75.4	76.6
	Cm	166	174	176	184	185	191	195
Handlebar	Width, mm	420	440	440	460	460	460	460
Stem	Length, mm	80	100	100	110	110	120	120
	Angle	12	12	12	12	12	12	12
Crank	Length, mm	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250
Steerer	Length, mm	188.5	203.5	219.5	236.0	254.5	278.5	298.5

GEARING

	39	53
12	86	117
13	79	108
14	74	100
15	69	93
17	61	82
19	54	74
21	49	67
23	45	61
25	41	56

BIKE WEIGHT (est.)

20.3 lb.
9.22 kg.

Buenos Aires T

RIDING STYLE.....Racer or fast Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select
STAYS .....Reynolds 525
3.7 lb. (1.68 kg.) — *Frame weight (estimated)*
FORK .....Bontrager Race
370 — *Axle-crown length, mm*
HEADSET .....Cane Creek C-1 Aheadset
25.4/34.0/30.0 — *Size*
26.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....3TTT The
26.0 — *Clamp diameter, mm*
STEM .....3TTT The
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Ultegra STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano 105 T
Down pull — *Cable routing*
31.8 mm/ 1 1/4" — *Attachment*
RR DERAILLEUR ...Shimano Ultegra GS
CRANKSET .....Shimano Ultegra 52/42/30
74/130 — *Bolt hole circle, mm*
BB .....Shimano 105
68 x 118, Splined, Shimano — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....Shimano HG70 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Select Road, 20°
592 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Bontrager Select Road, 32°
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Race Lite
700 x 25c — *Tire size*
REAR TIRE .....Bontrager Race Lite
700 x 25c — *Tire size*
SPOKES .....DT 14/15G butted stainless
278, Radial — *Front, mm*
293/294, 2x — *Rear, mm*
INNER TUBES .....Presta valve, 48mm stem

OTHER

SEATPOST .....LeMond
27.2 — *Outer diameter, mm*
SADDLE .....CRZ+ Road, Cro-Moly rails
BRAKES .....Shimano Ultegra
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51)

COLORS

Prime Blue / Yellow Metallic panel • Blue decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select tube-set- steel feel and durability, very low weight. Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Race level equipment is Shimano Ultegra offering Pro performance for a more economical price. Stiff and light oversize 3T bar and stem.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. They use butted spokes for stronger wheels and lower weight. Tires have natural carbon rubber tread for long tread life. Ultra-round profile for smooth cornering. 3-layer casing for puncture resistance. Folding bead reduces weight.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	64.7	65.5	68.4	69.2	72.3	72.7	75.3	77.8
	Cm	164	166	174	176	184	185	191	198
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	80	80	100	100	110	110	120	135
	Angle	12	12	12	12	12	12	12	12
Crank	Length, mm	170	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	187.7	187.7	202.7	218.7	235.2	253.7	277.7	297.7

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

20.6 lb.
9.35 kg.

Alpe d'Huez

RIDING STYLE.....Racer or fast Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select
STAYS .....Reynolds 525
3.7 lb. (1.68 kg.) — *Frame weight (estimated)*
FORK .....Bontrager Race
371 — *Axle-crown length, mm*
HEADSET .....Cane Creek C-1 Aheadset
25.4/34.0/30.0 — *Size*
26.7 — *Stack height, mm*

CONTROLS

HANDLEBAR .....3TTT The
26.0 — *Clamp diameter, mm*
STEM .....3TTT The
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano 105 STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano 105
Down pull — *Cable routing*
31.8 mm/ 1 1/4" — *Attachment*
RR DERAILLEUR ...Shimano 105
CRANKSET .....Shimano 105 53/39
130 — *Bolt hole circle, mm*
BB .....Shimano 105
68 x 109.5, Splined, Shimano — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....Shimano HG70 12-25, 9spd

WHEELSET

FRONT WHEEL ....Shimano Tiagra hub, 32°, Aurora rim
610 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Shimano Tiagra hub, 32°, Aurora RDR rim
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Select
700 x 25c — *Tire size*
REAR TIRE .....Bontrager Select
700 x 25c — *Tire size*
SPOKES .....DT 14G stainless
299, 3x — *Front, mm*
293/294, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....LeMond
27.2 — *Outer diameter, mm*
SADDLE .....CRZ+ Road
BRAKES .....Alloy dual pivot, cartridge pads
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51)

COLORS

Silver Metallic / Orange Pearl panel • White decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select tube-set- steel feel and durability, very low weight. Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Performance level equipment is Shimano 105 group with Tiagra hubs for full 18-speed racing features at a recreational price.

WHEELSET HIGHLIGHTS

Aurora rim with RDR (Reduced Dish Rim) is extra strong. Welded rim joint also increases strength, while machined sidewalls provide smooth braking. DT stainless spokes have a reputation as the best you can get. Tires have slick tread for minimum rolling resistance. 60 tpi (Threads per Inch) casing for durability.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	64.7	65.5	68.5	69.3	72.3	72.8	75.4	77.9
	Cm	164	166	174	176	184	185	191	198
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	80	80	100	100	110	110	120	135
	Angle	12	12	12	12	12	12	12	12
Crank	Length, mm	170	170	172.5	172.5	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	187.7	187.7	202.7	218.7	235.2	253.7	277.7	297.7

GEARING

	39	53
12	86	117
13	79	108
14	74	100
15	69	93
17	61	82
19	54	74
21	49	67
23	45	61
25	41	56

BIKE WEIGHT (est.)

20.4 lb.
9.26 kg.

Alpe d'Huez T

RIDING STYLE..... Enthusiast or Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select
STAYS .....Reynolds 525
3.7 lb. (1.68 kg.) — Frame weight (estimated)
FORK .....Bontrager Race
371 — Axle-crown length, mm
HEADSET .....Cane Creek C-1 Aheadset
25.4/34.0/30.0 — Size
26.7 — Stack height, mm

CONTROLS

HANDLEBAR .....3TTT The
26.0 — Clamp diameter, mm
STEM .....3TTT The
40.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano 105 STI, Flite Deck compatible
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano 105 T
Down pull — Cable routing
31.8 mm/ 1 1/4" — Attachment
RR DERAILLEUR ...Shimano 105 GS
CRANKSET .....Shimano 105 52/42/30
74/130 — Bolt hole circle, mm
BB .....Shimano 105
68 x 118, Splined, Shimano — Shell x axle, mm
CHAIN .....Shimano HG-53
9 speed — Chain type
108 — Chain length (links)
CASSETTE .....Shimano HG70 12-25, 9spd

WHEELSET

FRONT WHEEL ....Shimano Tiagra hub, 32°, Aurora rim
610 — E.R.D., mm
Velox 16mm — Rim strip
REAR WHEEL .....Shimano Tiagra hub, 32°, Aurora RDR rim
603 — E.R.D., mm
Velox 16mm — Rim strip
FRONT TIRE .....Bontrager Select
700 x 25c — Tire size
REAR TIRE .....Bontrager Select
700 x 25c — Tire size
SPOKES .....DT 14G stainless
299, 3x — Front, mm
293/294, 3x — Rear, mm
INNER TUBES .....Presta valve

OTHER

SEATPOST .....LeMond
27.2 — Outer diameter, mm
SADDLE .....CRZ+ Road
BRAKES .....Alloy dual pivot, cartridge pads
PEDALS .....Shimano SPD M515, clipless
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral bolt
31.9 — Inner diameter, mm
ADDITIONALS .....2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51)

COLORS

Silver Metallic / Orange Pearl panel • White decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select tube-set- steel feel and durability, very low weight. Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Performance level equipment is Shimano 105 group with Tiagra hubs for sporty 27-speed features at a recreational price.

WHEELSET HIGHLIGHTS

Aurora rim with RDR (Reduced Dish Rim) is extra strong. Welded rim joint also increases strength, while machined sidewalls provide smooth braking. DT stainless spokes have a reputation as the best you can get. Tires have slick tread for minimum rolling resistance. 60 tpi (Threads per Inch) casing for durability.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	64.7	65.5	68.5	69.3	72.3	72.8	75.4	77.9
	Cm	164	166	174	176	184	185	191	198
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	80	80	100	100	110	110	120	135
	Angle	12	12	12	12	12	12	12	12
Crank	Length, mm	170	170	170	170	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	187.7	187.7	202.7	218.7	235.2	253.7	277.7	297.7

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

20.7 lb.
9.40 kg.

Tourmalet

RIDING STYLE.....Enthusiast or Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select
STAYS .....Reynolds 525
3.7 lb. (1.68 kg.) — *Frame weight (estimated)*
FORK .....Bontrager Race
370 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Alloy Ergo
26.0 — *Clamp diameter, mm*
STEM .....3TTT The
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Tiagra STI Dual Control
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Tiagra
Down pull — *Cable routing*
31.8 mm/ 1 1/4" — *Attachment*
RR DERAILLEUR ...Shimano 105
CRANKSET .....Shimano Tiagra 53/39
130 — *Bolt hole circle, mm*
BB .....Shimano BB-UN40
68 x 110, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....Shimano HG50 12-25, 9spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix Aurora rim
610 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Shimano Tiagra hub, 32°, Matrix Aurora RDR rim
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Select
700 x 25c — *Tire size*
REAR TIRE .....Bontrager Select
700 x 25c — *Tire size*
SPOKES .....DT 14G stainless
299, 3x — *Front, mm*
293/294, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Alloy micro-adjust
27.2 — *Outer diameter, mm*
SADDLE .....CRZ+ Road
BRAKES .....Alloy dual pivot
PEDALS .....Alloy/alloy cage w/clips and straps
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51)

COLORS

Red / Blue Metallic panel • White decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select tube-set- steel feel and durability, very low weight. Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Tiagra group with 9 speed offers lots of close-ratio gears to choose from.

WHEELSET HIGHLIGHTS

Aurora rim with RDR (Reduced Dish Rim) is extra strong. Welded rim joint also increases strength, while machined sidewalls provide smooth braking. DT stainless spokes have a reputation as the best you can get. Tires have slick tread for minimum rolling resistance. 60 tpi (Threads per Inch) casing for durability.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	64.7	65.5	68.4	69.2	72.2	72.7	75.3	77.8
	Cm	164	166	174	176	183	185	191	198
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	80	80	100	100	110	110	120	135
	Angle	12	12	12	12	12	12	12	12
Crank	Length, mm	170	170	170	170	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	187.5	187.5	202.5	218.5	235.0	253.5	277.5	297.5

GEARING

	39	53
12	86	117
13	79	108
14	74	100
15	69	93
17	61	82
19	54	74
21	49	67
23	45	61
25	41	56

BIKE WEIGHT (est.)

21.7 lb.
9.85 kg.

Tourmalet T

RIDING STYLE..... Enthusiast or Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select
STAYS .....Reynolds 525
3.7 lb. (1.68 kg.) — *Frame weight (estimated)*
FORK .....Bontrager Race
370 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Alloy Ergo
26.0 — *Clamp diameter, mm*
STEM .....3TTT The
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Tiagra STI Dual Control
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Tiagra T
Down pull — *Cable routing*
31.8 mm/ 1 1/4" — *Attachment*
RR DERAILLEUR ...Shimano 105 GS
CRANKSET .....Shimano Tiagra 52/42/30
74/130 — *Bolt hole circle, mm*
BB .....Shimano BB-UN40
68 x 113, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....Shimano HG50 12-25, 9spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Aurora rim
610 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Shimano Tiagra hub, 32°, Aurora RDR rim
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Select
700 x 25c — *Tire size*
REAR TIRE .....Bontrager Select
700 x 25c — *Tire size*
SPOKES .....DT 14G stainless
299, 3x — *Front, mm*
293/294, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Alloy micro-adjust
27.2 — *Outer diameter, mm*
SADDLE .....CRZ+ Road
BRAKES .....Alloy dual pivot
PEDALS .....Alloy/alloy cage w/clips and straps
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51)

COLORS

Red / Blue Metallic panel • White decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select tube-set- steel feel and durability, very low weight. Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Tiagra group with a triple chainring and 9 speed cassette offers lots of close-ratio gears to choose from.

WHEELSET HIGHLIGHTS

Aurora rim with RDR (Reduced Dish Rim) is extra strong. Welded rim joint also increases strength, while machined sidewalls provide smooth braking. DT stainless spokes have a reputation as the best you can get. Tires have slick tread for minimum rolling resistance. 60 tpi (Threads per Inch) casing for durability.

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

22.0 lb.
9.99 kg.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	64.7	65.5	68.4	69.2	72.2	72.7	75.3	77.8
	Cm	164	166	174	176	183	185	191	198
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	80	80	100	100	110	110	120	135
	Angle	12	12	12	12	12	12	12	12
Crank	Length, mm	170	170	170	170	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	187.5	187.5	202.5	218.5	235.0	253.5	277.5	297.5

Tourmalet T women's

RIDING STYLE.....Woman Enthusiast or Century rider

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select
STAYS .....Reynolds 525
3.7 lb. (1.68 kg.) — *Frame weight (estimated)*
FORK .....Bontrager Race
370 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Alloy Ergo
26.0 — *Clamp diameter, mm*
STEM .....3TTT The
40.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Tiagra STI Dual Control
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Tiagra T
Down pull — *Cable routing*
31.8 mm/ 1 1/4" — *Attachment*
RR DERAILLEUR ...Shimano 105 GS
CRANKSET .....Shimano Tiagra 52/42/30
74/130 — *Bolt hole circle, mm*
BB .....Shimano BB-UN40
68 x 113, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
108 — *Chain length (links)*
CASSETTE .....Shimano HG50 12-25, 9spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix Aurora rim
610 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Shimano Tiagra hub, 32°, Matrix Aurora RDR rim
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Select
700 x 25c — *Tire size*
REAR TIRE .....Bontrager Select
700 x 25c — *Tire size*
SPOKES .....DT 14G stainless
299, 3x — *Front, mm*
293/294, 3x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Alloy micro-adjust
27.2 — *Outer diameter, mm*
SADDLE .....Oasis women's
BRAKES .....Alloy dual pivot
PEDALS .....Alloy/alloy cage w/clips and straps
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts

COLORS

Light Blue Metallic / White panel • Blue decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort, then adapted to fit and perform for her. Reynolds 853 Designer Select tubeset- steel feel and durability, very low weight. Fork has OCLV 150 blades for low weight, high strength. Alloy crown and steerer for stiffness, resistance to clamping forces. Straight legs are lightest possible design. Custom design for precise steering and comfort.

COMPONENTS HIGHLIGHTS

Tiagra group with a triple chainring and 9 speed cassette offers lots of close-ratio gears to choose from. Size specific components are selected to optimize a woman's performance; cranks, handlebars, saddle.

WHEELSET HIGHLIGHTS

Aurora rim with RDR (Reduced Dish Rim) is extra strong. Welded rim joint also increases strength, while machined sidewalls provide smooth braking. DT stainless spokes have a reputation as the best you can get. Tires have slick tread for minimum rolling resistance. 60 tpi (Threads per Inch) casing for durability.

FIT

Frame	Size	45	49	53
Rider height	Inches	64.0	65.2	68.4
	Cm	163	166	174
Handlebar	Width, mm	420	420	420
Stem	Length, mm	80	80	100
	Angle	12	12	12
Crank	Length, mm	165	165	170
Seatpost	Length, mm	250	250	250
Steerer	Length, mm	187.5	202.5	218.5

GEARING

	30	42	52
12	66	93	115
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
25	32	44	55

BIKE WEIGHT (est.)

21.8 lb.
9.90 kg.

Nevada City

RIDING STYLE..... Enthusiast or Century rider

FRAMESET

MAIN TUBES .....Reynolds 520
STAYS .....Reynolds 520
3.7 lb. (1.68 kg.) — Frame weight (estimated)
FORK .....Aero Cro-Moly
371 — Axle-crown length, mm
HEADSET .....STS Aheadset
22.2/30.2/26.4 — Size
23.0 — Stack height, mm

CONTROLS

HANDLEBAR .....Alloy Ergo
26.0 — Clamp diameter, mm
STEM .....Alloy quick change, direct connect
40.0 — Steerer clamp height, mm
SHIFT LEVERS .....Shimano Sora STI Dual Control
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Sora T
Down pull — Cable routing
31.8 mm/ 1 1/4" — Attachment
RR DERAILLEUR ...Shimano Sora GS
CRANKSET .....Shimano Sora 52/42/30
74/130 — Bolt hole circle, mm
BB .....Shimano BB-UN40
68 x 113, Square — Shell x axle, mm
CHAIN HG-50
3/32" — Chain type
108 — Chain length (links)
CASSETTE .....Shimano HG50 13-26, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Matrix Aurora rim
610 — E.R.D., mm
Velox 16mm — Rim strip
REAR WHEEL .....Alloy, QR hub, 32°, Matrix Aurora RDR rim
603 — E.R.D., mm
Velox 16mm — Rim strip
FRONT TIRE .....Bontrager Select
700 x 25c — Tire size
REAR TIRE .....Bontrager Select
700 x 25c — Tire size
SPOKES .....14G stainless
299, 3x — Front, mm
293/294, 3x — Rear, mm
INNER TUBES .....Presta valve

OTHER

SEATPOST .....LeMond
27.2 — Outer diameter, mm
SADDLE .....CRZ+ Road
BRAKES .....Alloy dual pivot
PEDALS .....Alloy w/clips and straps
9/16" — Axle diameter
SEAT BINDER .....Alloy w/integral bolt
31.9 — Inner diameter, mm
ADDITIONALS 2 water bottle mounts (1 bottle on 47, 49), pump peg (not on 47, 49, 51), stem shim from 1 to 1 1/8"

COLORS

Black Metallic / Yellow panels • Black decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 520 tubeset- steel feel and durability, very low weight. Aerodynamic fork shape in durable, dependable Cro-Moly steel.

COMPONENTS HIGHLIGHTS

Shimano Sora group with Dual Control provides 24 speed shifting and braking without moving your hands from the levers. Dual-pivot brakes are powerful with less hand pressure required.

WHEELSET HIGHLIGHTS

Aurora rim with RDR (Reduced Dish Rim) is extra strong. Welded rim joint also increases strength, while machined sidewalls provide smooth braking. Tires have slick tread for minimum rolling resistance. 60 tpi (Threads per Inch) casing for durability.

FIT

Frame	Size	47	49	51	53	55	57	59	61
Rider height	Inches	65.0	66.3	68.0	70.0	71.8	73.5	75.3	77.4
	Cm	165	168	173	178	182	187	191	197
Handlebar	Width, mm	420	420	440	440	460	460	460	460
Stem	Length, mm	85	90	100	110	110	120	120	130
	Angle	17	17	17	17	17	17	17	17
Crank	Length, mm	170	170	170	170	175	175	175	175
Seatpost	Length, mm	250	250	250	250	250	250	250	250
Steerer	Length, mm	184.0	184.0	199.0	215.0	231.5	250.0	274.0	294.0

GEARING

	30	42	52
13	61	85	106
14	57	79	98
15	53	74	92
17	47	65	81
19	42	58	72
21	38	53	66
23	35	48	60
26	31	43	53

BIKE WEIGHT (est.)

23.0 lb.
10.44 kg.

LEMOND CYCLO-CROSS AND FLAT-BAR ROAD

For 2003

We first built a Reynolds 853 LeMond in 1996. The Poprad uses this same great material, but in a competition cyclocross design. The frame remains unchanged from its introduction in 2001.

Geometry

The Poprad combines dirt-worthy handling with the advanced ergonomics of Greg's geometry to create a fast, stable ride.

The dirt features of the geometry include a slacker head tube for more trail. This allows the bike to track straighter in rough terrain. The bottom bracket is a touch higher, increasing pedal clearance for ruts and sidehills. The chainstays are longer, so the bike is more comfortable on rough surfaces. There is a lot more tire clearance, for riding bigger tires, or in muddy conditions.

Although the function of the bike is different, the rider compartment is within 1 or 2 millimeters of being exactly the same as our road bikes. If you like your LeMond road bike on pavement, you'll love the Poprad in the dirt.

Ride

Steel is famous for two things: durability and ride quality. Combined with Greg's geometry, the Poprad give an awesome ride.

The outstanding ride qualities of this frame is a smooth, comfortable ride and a wonderful reassurance in soft conditions.

Frame details

Starting with the butted tubeset, we've put the stiffness and strength where it needs to be. The material, wall thicknesses, and butting reduced the overall weight to make these very light steel framesets.

853 Designer Select

The Poprad is built from round 853 Designer Select tubes. This tubeset combines an 853 main triangle with Reynolds 525 stays. 853 and 525 have the same modulus (stiffness), but 853 has a greater tensile strength. In the main triangle, the higher strength of 853 allows us to use thinner, lighter tubes. With the stays, there's a limit on how thin the metal can be that's not determined by strength, but weldable thickness. If the material were any thinner, it would be extremely difficult to make a reliable weld. Since the 525 stays are already stronger than they need to be, there's no performance advantage to using 853 in the stays, just added cost.

All LeMond road bikes have 2 water bottle mounts.

Special parts

Seat collar 992562
Derailleur hanger 990116

	Frame sizes	49	52	55	57	59
	Head angle	72.0	72.0	72.5	72.5	73.0
	Seat angle	74.0	73.5	73.0	72.5	72.5
MILLIMETERS	Standover	776	795	817	833	852
	Seat tube	519	549	578	598	618
	Head tube	85	100	116	133	151
	Eff top tube	525	542	562	578	590
	Chainstays	430	430	430	430	430
	BB height	269	269	269	269	269
	Offset	45	45	45	45	45
	Trail	65	65	62	62	59
	Wheelbase	992	1004	1015	1025	1033
INCHES	Standover	30.5	31.3	32.2	32.8	33.5
	Seat tube	20.4	21.6	22.8	23.5	24.3
	Head tube	3.3	3.9	4.6	5.2	5.9
	Eff top tube	20.7	21.3	22.1	22.7	23.2
	Chainstays	16.9	16.9	16.9	16.9	16.9
	BB height	10.6	10.6	10.6	10.6	10.6
	Offset	1.8	1.8	1.8	1.8	1.8
	Trail	2.6	2.6	2.4	2.4	2.3
	Wheelbase	39.0	39.5	39.9	40.4	40.7

Poprad

RIDING STYLE..... Cyclo-cross racer

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select Cross
STAYS .....Reynolds 525
3.7 lb. (1.70 kg.) *Frame weight (estimated)*
FORK .....X-Lite Cross, alloy
405 *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 *Size*
26.5 *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Race CX
25.4 *Clamp diameter, mm*
STEM .....Bontrager Select
41.0 *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano Sora STI Dual Control
BRAKE LEVERS ....Integrated brake/shift
GRIPS .....Powercork

DRIVETRAIN

FT DERAILLEUR ...Shimano Sora
Down pull *Cable routing*
31.8 mm/ 1 1/4" *Attachment*
RR DERAILLEUR ...Shimano Sora
CRANKSET .....Shimano Sora 52/39
130 *Bolt hole circle, mm*
BB .....Shimano BB-UN40
68 x 110, Square *Shell x axle, mm*
CHAIN HG-50
3/32" *Chain type*
108 *Chain length (links)*
CASSETTE .....Shimano HG50 13-26, 8spd

WHEELSET

FRONT WHEEL ....Alloy, QR hub, 32°, Aurora rim
610 *E.R.D., mm*
Velox 16mm *Rim strip*
REAR WHEEL .....Alloy, QR hub, 32°, Matrix Aurora RDR rim
603 *E.R.D., mm*
Velox 16mm *Rim strip*
FRONT TIRE .....Bontrager Jones CX, 127tpi
700 x 32c *Tire size*
REAR TIRE .....Bontrager Jones CX, 127tpi
700 x 32c *Tire size*
SPOKES .....14G stainless
299, 3x *Front, mm*
293/294, 3x *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
27.2 *Outer diameter, mm*
SADDLE .....CRZ+ Road
BRAKES .....Avid Shorty 4, cantilever
PEDALS .....Shimano SPD M515, clipless
9/16" *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt, cable hanger
31.9 *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, Stem shim from 1" to 1 1/8", Front cable hanger

COLORS

Textured Blue / Silver panel • Blue decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select Cross tubeset- The LeMond feel, but designed for cyclo-cross handling.
Strong fork for hard riding. Designed for V-type brakes

COMPONENTS HIGHLIGHTS

Sora group with 'Cross gearing gives you wide range with the shift accuracy of a double chainring. Shorty 4 cantilever brakes provide powerful stopping, low clearance, and road lever compatible. Ultegra bar-end shifters are durable for real 'Cross action.

WHEELSET HIGHLIGHTS

Aurora rim with RDR (Reduced Dish Rim) is extra strong. Welded rim joint also increases strength, while machined sidewalls provide smooth braking. Tires have large road tire casing for shock absorption. 'Cross treads for traction. Low profile knobs for speed, low rolling resistance.

FIT

Frame	Size	49	52	55	57	59
Rider height	Inches	67.5	70.2	71.8	74.3	75.8
	Cm	171	178	182	189	192
Handlebar	Width, mm	420	440	460	460	460
Stem	Length, mm	90	105	105	120	120
	Angle	5	10	10	10	10
Crank	Length, mm	170	170	175	175	175
Seatpost	Length, mm	300	300	300	300	300
Steerer	Length, mm	188.5	203.5	219.5	236.0	254.5

GEARING

	39	52
13	81	108
14	75	100
15	70	94
17	62	83
19	55	74
21	50	67
23	46	61
26	41	54

BIKE WEIGHT (est.)

23.8 lb.
10.81 kg.

Wayzata

RIDING STYLE ..... **Performance commuter, extended urban adventure, or Fast day tourer**

FRAMESET

MAIN TUBES .....Reynolds 853 Designer Select Cross
STAYS .....Reynolds 525
3.7 lb. (1.70 kg.) — *Frame weight (estimated)*
FORK .....X-Lite Cross, alloy
405 — *Axle-crown length, mm*
HEADSET .....Aheadset, semi-cartridge
25.4/34.0/30.0 — *Size*
26.5 — *Stack height, mm*

CONTROLS

HANDLEBAR .....Bontrager Select
25.4 — *Clamp diameter, mm*
STEM .....Bontrager Sport
41.0 — *Steerer clamp height, mm*
SHIFT LEVERS .....Shimano R440
BRAKE LEVERS ....Avid AD 3L, long pull
GRIPS .....Serfas dual density

DRIVETRAIN

FT DERAILLEUR ...Shimano R-443
Down pull — *Cable routing*
31.8 mm/ 1 1/4" — *Attachment*
RR DERAILLEUR ...Shimano Tiagra GS
CRANKSET .....Shimano Tiagra 52/42/30
74/130 — *Bolt hole circle, mm*
BB .....Shimano BB-UN40
68 x 113, Square — *Shell x axle, mm*
CHAIN .....Shimano HG-53
9 speed — *Chain type*
112 — *Chain length (links)*
CASSETTE .....Shimano HG50 12-25, 9spd

WHEELSET

FRONT WHEEL ....Bontrager Select Road, 20°
592 — *E.R.D., mm*
Velox 16mm — *Rim strip*
REAR WHEEL .....Bontrager Select Road, 24°
603 — *E.R.D., mm*
Velox 16mm — *Rim strip*
FRONT TIRE .....Bontrager Select
700 x 23c — *Tire size*
REAR TIRE .....Bontrager Select
700 x 23c — *Tire size*
SPOKES .....DT 14/15G butted stainless
278, Radial — *Front, mm*
293/294, 2x — *Rear, mm*
INNER TUBES .....Presta valve

OTHER

SEATPOST .....Bontrager Sport
27.2 — *Outer diameter, mm*
SADDLE .....CRZ+ Road
BRAKES .....Avid Single Digit 3, linear pull
PEDALS .....Shimano SPD M515, clipless
9/16" — *Axle diameter*
SEAT BINDER .....Alloy w/integral bolt
31.9 — *Inner diameter, mm*
ADDITIONALS .....2 water bottle mounts, Stem shim from 1" to 1 1/8"

COLORS

Metal Flake Bronze / Silver panel • Red decal

FRAME AND FORK HIGHLIGHTS

LeMond geometry is developed from the Pro peloton for handling and comfort. Reynolds 853 Designer Select Cross tubeset- The LeMond feel, but designed for cyclo-cross handling. Strong fork for hard riding. Designed for V-type

COMPONENTS HIGHLIGHTS

Sora group with 'Cross gearing means wide range and easy climbing. Flat, mountain-style bars offer upright position and comfort.

WHEELSET HIGHLIGHTS

Bontrager Wheelworks wheels are engineered for low maintenance in a high performance design. They use butted spokes for stronger wheels and lower weight. Tires have slick tread for minimum rolling resistance. 60 tpi (Threads per Inch) casing for durability.

FIT

Frame	Size	49	52	55	57	59
Rider height	Inches	63.8	66.5	68.1	70.6	72.2
	Cm	162	169	173	179	183
Handlebar	Width, mm	600	600	600	600	600
Stem	Length, mm	90	105	105	120	120
	Angle	15	15	15	15	15
Crank	Length, mm	170	170	175	175	175
Seatpost	Length, mm	300	300	300	300	300
Steerer	Length, mm	178.5	193.5	209.5	226.0	244.5

GEARING

	30	42	52
12	68	95	117
13	62	87	108
14	58	81	100
15	54	76	94
17	48	67	83
19	43	60	74
21	39	54	67
23	35	49	61
25	32	45	56

BIKE WEIGHT (est.)

23.8 lb.
10.81 kg.

FOR THE MECHANIC

TORQUE SPECIFICATIONS

A Word about Torque Specifications

Torque is a measurement of the tightness of a threaded fastener such as a screw or bolt, determined by using a torque wrench. The torque specifications in this manual are listed to help you determine the correct tightness of parts and their threaded fasteners. More than anything, these should be used to make sure you do not over tighten the fasteners. Applying more than recommended torque to a fastener does not provide extra holding power and may actually lead to damage or failure of a part. For example, over tightening bar ends can crush a handlebar. Once a part is tight enough to stay tight and be safe, it rarely does any good to tighten the part any further.

We offer a range of torque specifications. Similar parts in different bikes may require different torques due to slight differences.

There are simple function tests you should perform to make sure a part is properly tightened. They should be performed whether a torque wrench was used or not and will suffice as a test for proper tightness if you do not have a torque wrench. As an example after assembling a bike you should determine if a stem is properly tightened to the fork. Place the front wheel between your knees and try to rotate the stem by twisting the handlebars from side to side. If the stem does not twist, it is properly tightened. While this test is somewhat subjective, it places a much greater force on the system than is required of the stem clamping force in normal riding.

Item	LB•IN	Nm
Handlebars		
Handlebar clamp bolt, forged stem	150-180	17-20.3
Handlebar clamp bolt, welded stem		
5mm allen wrench	100-120	11.3-13.6
Double clamp bolts, 4mm allen	45-60	5-6.8
Stem expander wedge bolt	175-260	19.8-29.4
Direct connect steerer clamp bolt		
External pinch type	100-120	11.3-13.6
ICON stem w/external bolts	70-90	7.9-10.1
Bar end attaching bolts	85-125	9.8-14.1
Seats		
Single seat attaching bolt w/6mm allen	125-200	14.1-22.6
Double seat attaching w/5mm allen	95-150	10.7-17
Double seat attaching w/4mm allen	35-55	4-6.2
Seat post binder bolt	50-180	17-20.3
Cranks		
Crank arm bolt, Shimano	310-380	35-43
Chainring bolt	50-70	5.7-7.9
Pedal attachment	350-380	40.2-42.9
Shimano cartridge fixed cup	350-608	40-70
Wheels		
Shimano cassette lock ring	261-434	30-50
Derailleurs/Shifters		
Front derailleur clamp bolt, clamp	25-35	2.8-4
Front derailleur clamp bolt, braze-on	44-60	4.9-6.8
Rear derailleur attaching bolt	70-85	7.9-9.6
Front and rear derailleur cable clamp bolt	35-52	3.5-5.9
Shifter clamp bolt	44	5
Combi shift/brake lever attaching bolt	53-69	6-8
Brakes		
Brake lever attaching bolt, standard	44-60	5-6.8
Integrated shift/brake lever attach bolt	53-69	6-8
Brake caliper attaching bolt	69-87	8-10
Cantilever/direct pull brake attach bolt	44-60	4.9-6.8
Caliper brake pad attaching bolt	43-61	5-7
Cantilever/direct pull brake pad attach nut	70-80	7.9-9
Brake cable clamping bolt	50-70	5.7-7.9
Int'national disc brake adapter, outer bolt	95-115	10.7-13
Int'national disc brake adapter, inner bolt	50-75	5.7-8.5
Rotor attachment bolt	40-60	4.5-6.8
Hayes caliper attachment bolt	60	6.8
Hayes lever clamp bolt	15-25	1.7-2.8
Frame Attachments		
Water bottle attaching bolt	20-25	2.3-2.8
Derailleur hanger attachment bolt	50-70	5.7-7.9
Sugar		
Shock mount bolts	133-164	15-18.5
Pivot bolts	95-115	10.7-13
Linkage bolts	50-75	5.7-8.5
Suspension Forks		
Brake boss	60	6.8

LOCTITE AND GREASE APPLICATIONS

Loctite Applications

We use Loctite, or similar product, in a variety of applications in fabrication and assembly of Fisher and LeMond bikes, and components on those bikes. Here's a partial list, and the recommended Loctite product:

Crown pinch bolts	242 Blue
Brake arch bolts	242 Blue
Cantilever studs	242 Blue
Pivot axle bolt, left	290 Green
Pivot axle bolt, right	242 Blue
Pivot bushings, frame/swingarm	290 Green
Shock mount bolts	242 Blue

Use Loctite carefully. Follow the instructions on the package, avoiding contact with your skin, or inhaling the vapors. As noted on the package, Loctite contains a known carcinogen.

For Loctite to work correctly, the parts must be clean and dry, with no grease, oil, or dirt. Loctite Kleen 'N Prime is an excellent cleaner and will reduce fixture time.

With blue 242 Loctite, apply to the threads prior to assembly. It will set up in 20 minutes, with full cure taking 24 hours. With green 290 Loctite, application is recommended after assembly. However, this can be impractical with hidden threads, like on the rear suspension pivot bolts or rear suspension bushings. 290 is set in 3 minutes, and again requires 24 hours for a full cure. Please do not confuse Loctite 290 with Loctite 640, which is also green, as 640 can make disassembly much more difficult.

Highly Recommended Grease Applications

Most threaded fasteners will benefit from the application of a light grease-type lubricant. This prevents corrosion and galling, as well as allowing a tighter fit with a given torque. For this reason, it's a good idea to lubricate almost all threaded fasteners. But some fasteners and parts interfaces really need grease. Here are a few items requiring grease application:

- Seatpost/seat tube interface. Grease the seatpost where it inserts into the frame on all aluminum and steel frames.
- Bottom bracket threads. We recommend applying grease to all bottom bracket/frame interfaces, as well as the bearing/cup interfaces. This prevents corrosion and will virtually eliminate creaks, a common complaint among riders with cartridge bottom brackets.
- Stem/steerer interface. Grease the quill of conventional stems where they insert into the fork. With Aheadset type stems, a light oil is recommended, as grease may make it difficult to properly secure this type of stem to the steerer.
- Stem/handlebar/bar end pinch bolts. Any and all of these fasteners are small, so corrosion or galling can really cause problems. Its also critically important to the riders safety that they be correctly tightened. Grease both the threads, as well as the bearing surface of the fasteners which rotate against the fixed part.

Places to Avoid Grease

- Bottom bracket axle/crank arm interface. Avoid greasing the tapered spindle of a bottom bracket, as this may allow the crank arm to insert an incorrect distance onto the bottom bracket spindle. This can cause crank arm clearance problems with the frame, or incorrect chainline with the specified components. A light oil will adequately prevent any unwanted corrosion in most cases.

CARBON STEERER MAINTENANCE

Carbon forks require special care

With the replacement of the metal parts of the Ouzo Pro fork with carbon composite material, special care must be taken in normal installation and maintenance procedures. Failure to observe these special needs could cause a part to fail, resulting in loss of control of the bicycle.

Do not use a traditional star-fangled nut

Never use a star-fangled nut with the carbon steerer of the Ouzo Pro. Attempting to insert a star-fangled nut into the carbon steerer will cut fibers, weakening the steerer.

Instead, use the Compression Adjustment Plug supplied with the fork. Used properly, this device allows proper preload of the headset bearings without damage to the steerer.

Follow the instructions which came with the fork to install and adjust the Compression Adjustment Plug.

Use the correct number of spacers

When adjusting the stem height on the carbon steerer of the Ouzo Pro fork, use at least 2 spacers (10mm) and not more than 1 1/2" (40mm) spacers.

Use no grease

Do not use grease between the stem and steerer.

Only use stems with a circumferential clamp design

When clamping an Ahead-type stem to the steerer of the Ouzo Pro fork, only use "circumferential" type stems. This type of stem applies even pressure all the way around the steerer. Stems which use sliding wedges to clamp the steerer, or similar designs with moving parts, do not meet this requirement.

In addition, the stem clamp design should be such that the gap of the clamp should be radial, and the bolts should be perpendicular to the gap. In other words, the gap of the clamp should point exactly towards the center of the steerer, and the bolts should be perpendicular to the gap. Furthermore, the clamping bolts should be as close to the steerer as possible.

Consult your dealer

Your Ouzo Pro fork has been properly installed at the factory, and adjusted by your dealer. If you are not sure of the correct main

SUGAR PIVOT SERVICE (ALL MODELS)

Prepare the bike

1. Clamp the frame upright in a workstand by its seatpost with the head tube vertical.
2. Remove the rear wheel and right crankarm. Disconnect the rear brake and rear derailleur cable.
3. If possible, open the front derailleur cage and remove the chain. Otherwise, remove the rear derailleur.

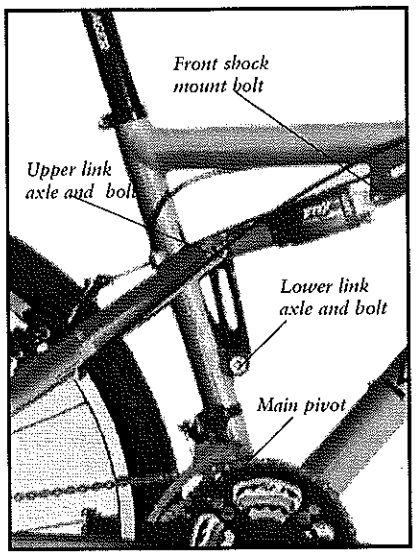

Fig. P1

Remove the rear swingarm

1. Remove the upper link bolt and axle (Fig. P1). Be careful not to let the shock swing down and hit a frame tube.
2. Remove the lower link bolt and axle.
3. Remove the front shock mount bolt.
4. Remove the main pivot bolt (Fig. P2).

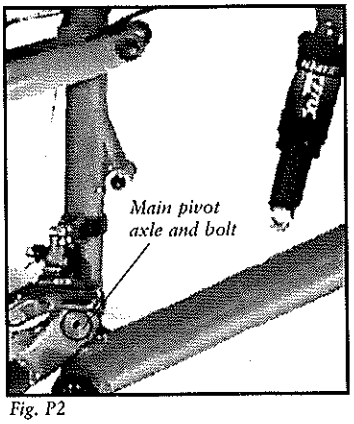

Fig. P2

Separate the parts

1. Remove the main pivot bushing from the frame. This part is held in place with Loktite, so you will probably need to lightly tap it with a hammer to drive it out of the frame (Fig. 16). A socket on an extension makes a good drift. The socket should contact the metal portion of the bushing, barely fitting inside the swingarm and pivot lug.

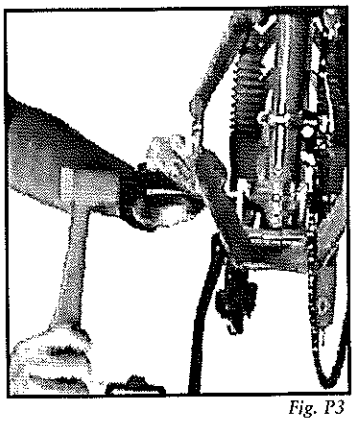
Fig. P3

Do not use heat to loosen the Loktite, as may damage the frame or paint.

2. Remove the main pivot bushing "top hats" from the swingarm. These are also installed with Loktite, so again tap them out with hammer using a properly sized socket. Avoid damage to the swingarm by properly supporting it as you drive out the bushings.
3. Inspect the bushings from the shock and both linkage axles. If they are in good shape, you can probably leave them. If not, remove them.

These bushings are installed dry, so you should be able to simply push them out. Do not use a screwdriver or other sharp tool, instead try something blunt like an allen wrench. If you use a sharp tool, you may cut or gouge the bearing surface, and this damage would require replacement of the bushing.

Inspect the parts

1. With a clean rag, wipe off all the surfaces. If any part is worn, it should be replaced. Signs of wear on the pivot and link axles are discoloration or a high degree of polish.

Some dark deposits may be left as the bushings and axle 'seat in' to each other. When this happens, some of the bearing material is sort of plated onto the axle. Its normal, and actually makes the pivot run smoother.

The bushings are harder to inspect; some discoloration is normal as the bushings and axle 'seat in' to each other. If wear looks uneven or non-concentric, its best to replace them.

When in doubt, throw out old parts. Its relatively cheap to replace the parts, and time consuming to perform a rebuild. You do the customer a favor by only tearing their bike apart once.

Prepare the parts for reassembly

1. Clean the bonding surfaces of the bushings and frame. These surfaces include the outside of the tubular main pivot bushing, the seating surfaces of the main pivot 'top hat' bushings that go into the swingarm, and the parts of the frame and swingarm that the bushings contact. These surfaces should be cleaned with Loktite Kleen 'n Prime.

   Be careful not to get Kleen 'n Prime on the paint or bushing material. It will remove paint, and also remove the lubrication in the bushings.

2. With the other bushings, simply wipe clean of dust or other debris.
3. Do not lubricate any bushings.
4. Clean the pivot and link bolts with Kleen n Prime.

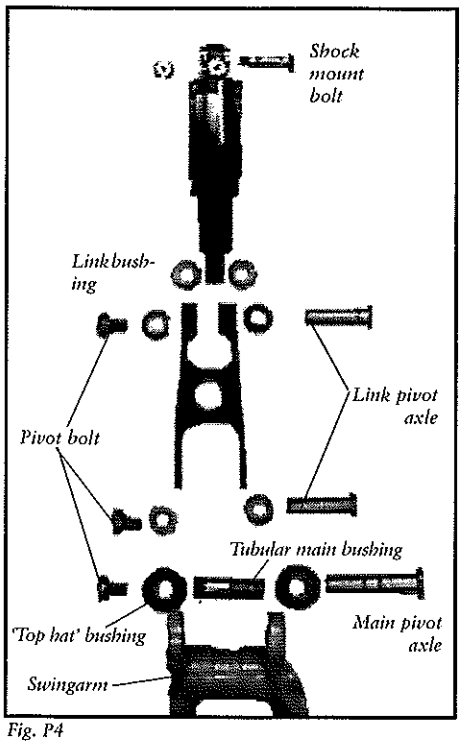

Fig. P4

Install the main pivot bushings

1. Check the fit of the bushings in the frame and swingarm by dry-assembling them (practice installation, but without Loktite). Normally the bushings are a light press fit, meaning they are snug but easily go into place with hand pressure. If the parts fit correctly, go to Step 2. If they seem very loose, go to Step 3.
2. If the parts fit correctly, apply Loktite 290 to all contact surfaces between the bushings and the frame or swingarm, and install the bushings.
3. If the parts seem very loose, Loktite RC680 is required. 290 is a thread locker, and it works best where parts are in tight contact. RC 680 is a filler, so it has the ability to fill larger gaps and securely bond parts that do not fit tightly together.
4. After installing the bushings, wipe off any excess Loktite, particularly removing any Loktite that contacts the bearing surface.

Install the main pivot axle.

1. Carefully align the swingarm with the main pivot of the frame. The fit is tight. Avoid contact between the bushings and any residual Loktite.
2. Align the swingarm and install the main pivot axle (the long one) from the right side of the bike. Slide it all the way through the frame and swingarm eyes.
3. Apply Loktite 290 to the threads of the pivot bolt, and install the bolt from the left side of the bike. Tighten to 61-75 lb•in (6.9-8.5Nm).

Install the link bushings

1. The bushings supporting the link, the swingarm link pivot, and rear shock are all installed dry. Simply press them into place, being careful to keep them aligned during insertion.

Install the lower link pivot axle.

1. This axle goes through the link and the frame. Make sure the link is oriented in the way you'd like it (note printing on the side, etc.). Insert the lower link axle from the left side of the bike.
2. Apply Loktite 290 to the threads of the pivot bolt, and install the bolt from the right side of the bike. Tighten to 50-75 lb•in (5.7-8.5 Nm).

Install the upper link pivot axle.

1. This axle goes through the swingarm, link, and rear shock. Make sure the shock orientation is how you would like it. Insert the upper link axle from the right side of the bike.
2. Apply Loktite 290 to the threads of the pivot bolt, and install the bolt from the left side of the bike. Tighten to 15-20 lb•in (1.7-2.2 Nm).

Install the shock mount bolt.

1. Insert the shock mount bolt.
2. Apply Loktite 290 to the threads of the pivot bolt, and install the bolt from the right side of the bike. Tighten to 61-75 lb•in (6.9-8.5Nm).

Allow to Dry

Loktite normally requires 24 hours to full set. During this time, the bike should not be ridden. Do not compress the suspension or in other ways disturb the Loktite until is has fully set.