This manual contains important safety, performance and service information. Read it before you take the first ride on your new bicycle, and keep it for reference.

Your Cervélo bicycle will be delivered to you fully assembled by your authorized Cervélo retailer according to the requirements set out in this manual. Additional safety, performance and service information for specific components such as pedals, or for accessories such as helmets orights that you purchase, may also be available. Make sure that your retailer has given you all the manufacturers’ literature that was included with your bicycle or accessories. In case of a conflict between the instructions in this manual and information provided by a component manufacturer, always follow the component manufacturer’s instructions.

If you have any questions or do not understand something, take responsibility for your safety and consult with your retailer as a first point of contact, or with Cervélo directly.

This manual is not intended as a comprehensive use, service, repair or maintenance manual. Please see your retailer for all service, repairs or maintenance. Your retailer may also be able to refer you to classes, clinics or books on bicycle use, service, repair or maintenance.
GENERAL WARNING
Like any sport, bicycling involves risk of injury and damage. By choosing to ride a bicycle, you assume the responsibility for that risk, so you need to know — and to practice — the rules of safe and responsible riding and of proper use and maintenance. Proper use and maintenance of your bicycle reduces risk of injury.

This Manual contains many “Warnings” and “Cautions” concerning the consequences of failure to maintain or inspect your bicycle and of failure to follow safe cycling practices.

The combination of the safety alert symbol and the word WARNING indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

The combination of the safety alert symbol and the word CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or is an alert against unsafe practices.

The word CAUTION used without the safety alert symbol indicates a situation which, if not avoided, could result in serious damage to the bicycle or the voiding of your warranty.

Many of the Warnings and Cautions say “you may lose control and fall”. Because any fall can result in serious injury or even death, we do not always repeat the warning of possible injury or death.

Because it is impossible to anticipate every situation or condition which can occur while riding, this Manual makes no representation about the safe use of the bicycle under all conditions. There are risks associated with the use of any bicycle which cannot be predicted or avoided, and which are the sole responsibility of the rider.
As a parent or guardian, you are responsible for the activities and safety of your minor child, and that includes making sure that the bicycle is properly fitted to the child; that it is in good repair and safe operating condition; that you and your child have learned and understand the safe operation of the bicycle; and that you and your child have learned, understood and obey not only the applicable local motor vehicle, bicycle and traffic laws, but also the common sense rules of safe and responsible bicycling. As a parent, you should read this manual, as well as review its warnings and the bicycle’s functions and operating procedures with your child, before letting your child ride the bicycle.

**A SPECIAL NOTE FOR PARENTS**

Make sure that your child always wears an approved bicycle helmet when riding; but also make sure that your child understands that a bicycle helmet is for bicycling only, and must be removed when not riding. A helmet must not be worn while playing, in play areas, on playground equipment, while climbing trees, or at any time while not riding a bicycle. Failure to follow this warning could result in serious injury or death.

**WARNING**

1. **First**
   - Make sure that your child always wears an approved bicycle helmet when riding; but also make sure that your child understands that a bicycle helmet is for bicycling only, and must be removed when not riding. A helmet must not be worn while playing, in play areas, on playground equipment, while climbing trees, or at any time while not riding a bicycle. Failure to follow this warning could result in serious injury or death.

2. **Safety First**
   - Always wear an approved helmet when riding your bike, and follow the helmet manufacturer’s instructions for fit, use and care.
   - Do you have all the other required and recommended safety equipment? See Section 2. It’s your responsibility to familiarize yourself with the laws of the areas where you ride, and to comply with all applicable laws.
   - Do you know how to correctly secure your front and rear wheels? Check Section 4.A to make sure. Riding with an improperly secured wheel can cause the wheel to wobble or disengage from the bicycle, and cause serious injury or death.
   - If your bike has toe clips and straps or clipless (“step-in”) pedals, make sure you know how they work (see Section 4.D). These pedals require special techniques and skills. Follow the pedal manufacturer’s instructions for use, adjustment and care.
   - Do you have “toe overlap”? On smaller framed bicycles your shoe or toe clip may be able to contact the front wheel when a pedal is all the way forward and the wheel is turned. Read Section 4.D to check whether you have toe clip overlap.

3. **Mechanical Safety Check**
   - Routinely check the condition of your bicycle before every ride.
   - Nuts, bolts screws & other fasteners: Because manufacturers use a wide variety of faster sizes and shapes made in a variety of materials, often differing by model and component, the correct tightening force or torque cannot be generalized. To make sure that the many
fasteners on your bicycle are correctly tightened, refer to the Fastener Specifications in Appendix C of this manual or to the torque specifications in the instructions provided by the manufacturer of the component in question. Correctly tightening a fastener requires a calibrated torque wrench. A professional bicycle mechanic with a torque wrench can tighten the fasteners on your bicycle. If you choose to work on your own bicycle, you must use a torque wrench and the correct tightening torque specifications from the bicycle or component manufacturer or from your retailer. If you need to make an adjustment at home or in the field, we urge you to exercise care, and to have the fasteners you worked on checked by your retailer as soon as possible.

**CAUTION**

Wheels must be true for rim brakes to work effectively. Wheel truing is a skill which requires special tools and experience. Do not attempt to true a wheel unless you have the knowledge, experience and tools needed to do the job correctly.

- **Wheels true?** Spin each wheel and check for brake clearance and side-to-side wobble. If a wheel wobbles side to side even slightly, or rubs against or hits the brake pads, take the bike to a qualified bike shop to have the wheel trued.

**WARNING**

Correct tightening force on fasteners – nuts, bolts, screws – on your bicycle is important. Too little force, and the fastener may not hold securely. Too much force, and the fastener can strip threads, stretch, or break. Either way, incorrect tightening force can result in component failure, which can cause you to lose control and fall.

- **Make sure nothing is loose.** Lift the front wheel off the ground by two or three inches, then let it bounce on the ground. Anything sound, feel or look loose? Do a visual and tactile inspection of the whole bike. Any loose parts or accessories? If so, secure them. If you're unsure, ask someone with experience to check.
- **Make sure tires are correctly inflated (see Section 4.E). Check by putting one hand on the saddle, one on the intersection of the handlebars and stem, then bouncing your weight on the bike while looking at tire deflection. Compare what you see with how it looks when you know someone with experience to check.
- **Tires in good shape?** Spin each wheel and look for cuts in the tread and sidewall. Replace damaged tires before riding the bike.
- **Tire pressure:** Make sure the front and rear wheels are correctly secured. See Section 4.A
- **Handlebar and saddle alignment:** Make sure the saddle and handlebar stem are parallel to the bike's center line and clamped tight enough so that you cannot twist them out of alignment. See Sections 3.A and 4.A.
- **Handlebar ends:** Handlebar grips are secure and in good condition. If not, have your retailer replace them. Make sure the handlebar extensions are plugged. If not, have your retailer plug them before you ride. If the handlebar's have bar end extensions, make sure they are clamped tight enough so you can't twist them.
- **Brakes:** Check the brakes for proper operation (see Section 4.B). Squeeze the brake levers. Are the brake quick-releases closed? All control cables seated and securely engaged? If you have rim brakes, do the brake pads contact the wheel rim squarely and make full contact with the rim? Do the brakes begin to engage within an inch of brake lever movement? Can you apply full braking force at the levers without touching the handlebar? If not, your brakes need adjustment. Do not ride the bike until the brakes are properly adjusted by a professional bicycle mechanic.

**WARNING**

Bicycle wheel rims are subject to wear. Ask your retailer about wheel rim wear. Some wheel rims have a rim wear indicator which becomes visible as the rim's braking surface wears. A visible rim wear indicator marking is not visible at any point on the wheel rim.

**WARNING**

Loose or damaged handlebar grips or extensions can cause you to lose control and fall. Unplugged handlebars or extensions can cut you and cause serious injury in an otherwise minor accident.

**VERYIMPORTANT SAFETY NOTE:** Please also read and become thoroughly familiar with the important information on the lifespan of your bicycle and its components in Appendix B on page 40.

**D. First Ride**

When you buckle on your helmet and go for your first familiarization ride on your new bike, be sure to select a controlled environment, away from cars, other cyclists, obstacles or other hazards. Ride to become familiar with the controls, features and performance of your new bike.

Familiarize yourself with the braking action of the bike (see Section 4.B). Test the brakes at slow speed, putting your weight toward the rear and gently applying the brakes, rear brake first. Sudden or excessive application of the front brake could pitch you over the handlebars. Applying brakes too hard can lock up a wheel, which could cause you to lose control and fall. Skidding is an example of what can happen when a wheel locks up.

If your bicycle has toe clips or clipless pedals, practice getting in and out of the pedals. See paragraph 1.B.4 above and Section 4.D.4.

Practice shifting the gears (see Section 4.C). Remember to never move the shifter while pedaling backward, nor pedal backwards immediately after having moved the shifter. This could jam the chain and cause serious damage to the bicycle.

Check out the handling and response of the bike; and check the comfort. If you have any questions, or if you feel anything about the bike is not as it should be, consult your retailer before you ride again.
2. SAFETY

A. The Basics

1. Always wear a cycling helmet. The area in which you ride may require specific safety devices. It is your responsibility to familiarize yourself with the laws of the area where you ride and to comply with all applicable laws, including properly equipping yourself and your bike as the law requires.

2. Always do the Mechanical Safety Check (Section 1.C) before you get on your bike.

3. Be thoroughly familiar with the controls of your bicycle: brakes (Section 4.B); pedaling (Section 4.D); shifting (Section 4.C).

4. Be sure to keep both body parts and other objects away from the sharp teeth of chain rings, the moving chain, the turning pedals and cranks, and the spinning wheels of your bicycle.

5. Always wear:
   - Shoes that will stay on your feet and will grip the pedals. Make sure that shoe laces cannot get into moving parts, and never ride barefoot or in sandals.
   - Bright, visible clothing that is not so loose that it can be tangled in the bicycle or snagged by objects at the side of the road or trail.
   - Protective eyewear, to protect against airborne dirt, dust and bugs — tinted when the sun is bright, clear when it’s not.

6. Don’t jump with your bike. Jumping a bike can be fun; but it can put huge and unpredictable stress on the bicycle and its components. Riders who insist on jumping their bikes risk serious damage, to themselves as well as to themselves. Before you attempt to jump, do stunts while racing or race with your bike, read and understand Section 2.F.

7. Ride at a speed appropriate for conditions. Higher speed means higher risk.

B. Riding Safety

1. Obey all Rules of the Road and all local traffic laws.

2. Be careful to keep body parts and other objects away from the sharp teeth of chain rings, the moving chain, the turning pedals and cranks, and the spinning wheels of your bicycle.

3. Be thoroughly familiar with the controls of your bicycle: brakes (Section 4.B); pedaling (Section 4.D); shifting (Section 4.C).

4. Look ahead, and be ready to avoid:
   - Vehicles slowing or turning, entering the road or your lane ahead of you, or coming up behind you.
   - Parked cars opening doors.
   - Pedestrians stepping out.
   - Children or pets playing near the road.
   - Pot holes, sewer grating, railroad tracks, expansion joints, road or sidewalk construction, debris and other obstructions that could cause you to swerve into traffic, catch your wheel or cause you to have an accident.

5. Use approved hand signals for turning and stopping.

6. Be considerate to other cyclists. Respect their rights.

7. Never carry anything which obstructs your vision or your complete ability to control the bicycle, or which could become entangled in the moving parts of the bicycle.

8. Ride defensively. Always assume that others do not see you.

9. Always follow the helmet manufacturer’s instructions for fit, use and care of your helmet. Most serious bicycle injuries involve head injuries which might have been avoided if the rider had worn an appropriate helmet.

10. Never hitch a ride by holding on to another vehicle.

11. Never ride your bicycle while under the influence of alcohol or drugs.

12. Don’t do stunts, wheelies or jumps. If you intend to do stunts, wheelies, jumps or go racing with your bike despite our advice not to, read Section 2.G. Extreme, Stunt, or Competition riding, now. Think carefully about your skills before deciding to take the large risks that go with this kind of riding.

13. Don’t weave through traffic or make any moves that may surprise people with whom you are sharing the road.

14. Be aware of the right of way.

15. Don’t ride with headphones. They mask traffic sounds and emergencies.

16. If possible, avoid riding in bad weather, when visibility is obscured, at dawn, dusk or in the dark, or when extremely tired. Each of these conditions increases the risk of accident.
D. Wet Weather Riding

1. Wet conditions impair traction, braking and visibility, both for the bicyclist and for other vehicles sharing the road. The risk of an accident is 3 to 6 times higher on wet than on dry roads. In wet conditions, ride more slowly and apply your brakes earlier and more gradually than you would under normal, dry conditions. See also Section 4.B.

E. Night Riding

Riding at night is a significant risk. According to the National Highway Traffic Safety Administration, you are 4 times more likely to be involved in a bicycle accident if you are riding at night than if you are riding during the day. A bicyclist is very difficult for motorists and pedestrians to see.

At night, be visible and ride carefully.

1. Wear light-colored clothing and headlamps or carry a flashlight. Put your reflectors in working order. If you cannot see clearly, you will not be seen.

2. If you have a headlamp, use it and turn it on before you start to pedal. Throughout your ride, keep your beam on and do not aim it directly at oncoming traffic.

3. If you do not have a headlamp, turn on your rear reflector or red tail light to make yourself visible to oncoming traffic.

If you ride in traffic: (See section 5.B)

• Ride slowly.
• Avoid dark areas and areas of heavy or fast-moving traffic.
• Be alert. Ride defensively and expect the unexpected.
• Be predictable. Ensure drivers can see you and predict your move- ment.
• Use hand signals that are clear, loud and distinctive.
• Be considerate. Let others know where you are going and when you expect to be back.

If you ride alone: (See section 3.D)

• Ride slowly.
• Avoid dark areas and areas of heavy or fast-moving traffic.
• Be alert. Ride defensively and expect the unexpected.
• Be predictable. Ensure drivers can see you and predict your move- ment.
• Use hand signals that are clear, loud and distinctive.
• Be considerate. Let others know where you are going and when you expect to be back.

F. Racing or Competition

Bicycles and bicycle parts have limitations with regard to strength and integrity, and riding in competition can exceed those limitations. In particular the following situations can exceed the design limits of your bicycle, and result in a loss of control and falling which could result in serious injury or death.

• Impacts or crashes (See section 5.B)
• Hopping/jumping your bicycle
• Riding over curbs, stix or debris
• Impacts or crashes (See section 5.B)

If in traffic:

• Be predictable. Drivers need to know where you are going and when you expect to be back.

• Be alert. Riders defensively and expect the unexpected.

• Be considerate. Let others know where you are going and when you expect to be back.

• Be predictable. Ensure drivers can see you and predict your move- ment.

• Use hand signals that are clear, loud and distinctive.
• Be considerate. Let others know where you are going and when you expect to be back.

WARNING

Do not remove the front or rear reflectors or reflector brackets from your bicycle. They are an integral part of the bicycle’s safety system. Removing the reflectors reduces your visibility to others using the roadway. Being struck by other vehicles may result in serious injury or death.

If you choose to ride under conditions of poor visibility, check and be sure you comply with all local laws about night riding, and take the following strongly recommended additional precautions:

1. Purchase and install battery or generator powered head and tail lights which meet all regulatory requirements and provide adequate vis- ibility. (See section 4.B)

2. Wear light-colored reflective clothing and accessories, such as a reflective vest, reflective arm and leg bands, reflective stripes on your helmet, flashing lights attached to your body and/or your bicycle — anything reflective or light source that moves will help you get the attention of approaching motorists, pedestrians and other traffic.

3. Make sure your clothing or anything you may be carrying on your bicycle does not obstruct a reflector or light.

4. Make sure that your bicycle is equipped with correctly positioned and securely mounted reflectors.

5. If possible, ride on familiar routes.

6. Avoid dark areas and areas of heavy or fast-moving traffic.

7. Be alert. Ride defensively and expect the unexpected.

8. Be predictable. Ensure drivers can see you and predict your move- ment.

9. Use hand signals that are clear, loud and distinctive.

10. Be considerate. Let others know where you are going and when you expect to be back.

WARNING

At night or at other times of poor visibility, check and be sure you comply with all local laws about night riding, and take the following strongly recommended additional precautions:

1. Purchase and install battery or generator powered head and tail lights which meet all regulatory requirements and provide adequate vis- ibility. (See section 4.B)

2. Wear light-colored, reflective clothing and accessories, such as a reflective vest, reflective arm and leg bands, reflective stripes on your helmet, flashing lights attached to your body and/or your bicycle — anything reflective or light source that moves will help you get the attention of approaching motorists, pedestrians and other traffic.

3. Make sure your clothing or anything you may be carrying on your bicycle does not obstruct a reflector or light.

4. Make sure that your bicycle is equipped with correctly positioned and securely mounted reflectors.

5. If possible, ride on familiar routes.

6. Avoid dark areas and areas of heavy or fast-moving traffic.

7. Be alert. Ride defensively and expect the unexpected.

8. Be predictable. Ensure drivers can see you and predict your move- ment.

9. Use hand signals that are clear, loud and distinctive.

10. Be considerate. Let others know where you are going and when you expect to be back.

WARNING

If you ride in traffic:

• Be predictable. Drivers need to know where you are going and when you expect to be back.

• Be alert. Riders defensively and expect the unexpected.

• Be considerate. Let others know where you are going and when you expect to be back.

• Be predictable. Ensure drivers can see you and predict your move- ment.

• Use hand signals that are clear, loud and distinctive.

• Be considerate. Let others know where you are going and when you expect to be back.
Cervélo bicycles are designed for road riding, road racing, time-trialing, track racing, and triathlon competitions. However, without proper maintenance and regular inspection (refer to section 5.A), or with substitution of inappropriate components (section 2.H), the safety and reliability of your bicycle can be compromised. When riding fast in competition or downhill, you can reach speeds achieved by motorcycles, and therefore face similar hazards and risks. Have your bicycle and equipment carefully inspected by a qualified mechanic and be sure it is in perfect condition. Consult with expert riders, area site personnel and race officials on conditions and equipment advisable at the site where you plan to ride. Wear appropriate safety gear. Ultimately, it is your responsibility to have proper equipment and to be familiar with course conditions.

We also recommend the following before competing with your Cervélo:

- Start with easy learning exercises and slowly develop your skills
- Use only designated or appropriate areas for racing or fast downhill riding
- Always wear a helmet and other appropriate safety gear
- Understand and recognize that the stresses imposed on your bike by this kind of activity may break or damage parts of the bicycle and void the warranty
- Take your bicycle to your retailer if anything breaks or bends. Do not ride your bicycle when any part is damaged.

If you ride downhill at speed, or ride in competition, know the limits of your skill and experience. Ultimately, avoiding injury is your responsibility.

G. Extreme or Stunt Riding
Whether you call it Aggro, Huckling, Freeride, North Shore, Downhill, Jumping, Stunt Riding, or something else: if you engage in this sort of extreme, aggressive riding you will get hurt, and you voluntarily assume a greatly increased risk of injury or death.

H. Changing Components or Adding Accessories
There are many components and accessories available to enhance the comfort, performance and appearance of your bicycle. However, if you change components or add accessories, you do so at your own risk. Cervélo may not have tested that component or accessory for compatibility, reliability or safety on your bicycle. Before installing any component or accessory, including a different size tire, make sure that it is compatible with your bicycle by checking with your retailer or with Cervélo Customer Service. Be sure to read, understand and follow the instructions that accompany the products you purchase for your bicycle. See also Appendix A, p. 39 and B, p. 40.

I. Aerobars
Braking is made more difficult when using aerobars as your hands are positioned further from the brake levers compared to standard handlebars – in an emergency you need first sit up and move your hands back towards the base bar and out to the brake levers to begin braking. If brake levers are attached to the aerobars, you must remember that your weight is positioned further forward than normal, with more weight on the front wheel. Caution should be exercised when braking from this position as the forward weight bias makes it more likely for you to flip over the front wheel if the front brake is applied too strongly. See also section 4.B.

Regarding handling, the bike is more difficult to steer from the aero hand position as you are steering with your elbows instead of hands, and with a narrower total width as compared to standard handlebars. This makes it more difficult to ride in a straight line, and the bike will react more strongly to bumps or other unexpected inputs. It is highly recommended that you

- Practice riding in a smooth, flat area, away from traffic, until you become familiar with the handling characteristics imparted by aerobars. Once mastered, aerobars are never recommended for use when riding in a group or in heavy traffic for safety reasons.

- Care should be exercised when utilizing aerobars at all times, as these bars, while highly effective at decreasing aerodynamic drag, also decrease the bicycle’s ability to steer and brake relative to standard handlebars.

WARNING
Changing the components on your bike with other than genuine replacement parts may compromise the safety of your bicycle and may void the warranty. Check with your retailer before changing the components on your bike. Failure to confirm compatibility, properly install, operate and maintain any component or accessory can result in serious injury or death.

I. Aerobars

CAUTION
Failure to confirm compatibility, properly install, operate and maintain any aerobar or related component or accessory can result in serious injury or death.
3. FIT

NOTE: Correct fit is an essential element of bicycling safety, performance and comfort. Making the adjustments to your bicycle which result in correct fit for your body and riding conditions requires experience, skill and special tools. Always have your retailer make the adjustments to your bicycle; or, if you have the experience, skill and tools, have your retailer check your work before riding.

A. Standover Height

1. Diamond Frame Bicycles

Standover height is the basic element of bike fit (see fig. 1). It is the distance from the ground to the top of the bicycle’s frame at that point where your crotch is when straddling the bike. To check for correct standover height, sit on the saddle while wearing the kind of shoes in which you’ll be riding, and bounce fore and aft. 

The saddle can be adjusted in three ways:

1. Up and down adjustment. To check for correct saddle height (fig. 3):
   a. Sit on the saddle;
   b. Place one heel on a pedal;
   c. Rotate crank until the pedal is parallel to the seat tube;
   d. Measure the distance from the ground to the top of the seat tube with your heel on it in the down position and the crank arm is parallel to the seat tube. The saddle can be adjusted in three ways:

2. Step-Through Frame Bicycles

Standover height does not apply to bicycles with step-through frames. Instead, the limiting dimension is determined by saddle height range. If your bike has an interrupted seat tube, you must also make sure that the seat post is inserted in the seat tube far enough to be visible through the sight hole.

Some bicycles have a sight hole in the seat tube, which make it easy to see whether the seat post is inserted in the seat tube far enough to be visible. If your bicycle has such a straddling sight hole, use it instead of the “Minimum Insertion” or “Maximum Extension” mark to make sure the seat post is inserted in the seat tube far enough to be visible through the sight hole.

If your bike has an interrupted seat tube, as is the case on some suspension or triathlon bikes, you must also make sure that the seat post is far enough into the frame so that you can touch it through the bottom of the interrupted seat tube with the tip of your finger without inserting your finger beyond its first knuckle. (Also see NOTE above and fig. 5).

WARNING

If your bicycle does not fit properly, you may lose control and fall. If your new bike doesn’t fit, ask your retailer to exchange it before you ride it.

B. Saddle Position

Correct saddle adjustment is an important factor in getting the most performance and comfort from your bicycle. If the saddle position is not comfortable for you, see your retailer.

The saddle can be adjusted in three ways:

1. Up and down adjustment. To check for correct saddle height (fig. 3):
   a. Sit on the saddle;
   b. Place one heel on a pedal;
   c. Rotate crank until the pedal is parallel to the seat tube;
   d. Measure the distance from the ground to the top of the seat tube with your heel on it in the down position and the crank arm is parallel to the seat tube.

2. Front & Back Adjustment

The saddle can be adjusted forward or back to help you get the optimal position on the bike. Ask your retailer to set the saddle in your riding position and to show you how to make this adjustment. If you choose to make your own front and back adjustment, make sure that the clamp mechanism is clamping on the straight part of the saddle rails and is not touching the curved part of the rails, and that you are using the recommended torque on the clamping fastener(s) (Appendix C or the manufacturer’s instructions).

Saddle Angle Adjustment

Most people prefer a horizontal saddle; but some riders like the saddle nose angled up or down just a little. Your retailer can adjust saddle angle to suit your needs. If you choose to make your own saddle angle adjustment and you have a single bolt saddle clamp on your seat post, it is critical that you loosen the clamp bolt sufficiently to allow any serrations on the mechanism to disengage before changing the saddle’s angle, and then that the serrations fully re-engage before you tighten the clamp bolt to the recommended torque (Appendix C or the manufacturer’s instructions).

Ask your retailer to set the saddle for your optimal riding position and to show you how to make this adjustment. If you choose to make your own saddle height adjustment:

- Loosen the seat post clamp;
- Raise or lower the seat post in the seat tube;
- Make sure the saddle is straight (side to side);
- Re-tighten the seat post clamp to the recommended torque (Appendix C or the manufacturer’s instructions).

Once the saddle is at the correct height, make sure that the seat post does not project from the frame beyond its “Minimum Insertion” or “Maximum Extension” mark (fig. 4).

NOTE: Some bicycles have a sight hole in the seat tube, which is used to determine whether the seat post is inserted in the seat tube far enough to be safe. If your bicycle has such a straddling sight hole, use it instead of the “Minimum Insertion” or “Maximum Extension” mark to make sure the seat post is inserted in the seat tube far enough to be visible through the sight hole.

If your bike has an interrupted seat tube, as is the case on some suspension or triathlon bikes, you must also make sure that the seat post is far enough into the frame so that you can touch it through the bottom of the interrupted seat tube with the tip of your finger without inserting your finger beyond its first knuckle. (Also see NOTE above and fig. 5).

WARNING

If your saddle is not inserted in the seat tube as described in 3.B.1 above, the seat post may break, which could cause you to lose control and fall.
Small changes in saddle position can have a substantial effect on performance and comfort. To find your best saddle position, make only one adjustment at a time. If, in spite of carefully adjusting the saddle height, tilt and fore-and-aft position, your saddle is still uncomfortable, you may need a different saddle.

WARNING

When making saddle angle adjustments with a single bolt saddle clamp, always check to make sure that the serrations on the mating surfaces of the clamp are not worn. Worn serrations on the clamp can allow the saddle to move, causing you to lose control and fall. Always tighten fasteners to the correct torque. Bolts that are too loose can stretch and deform. Bolts that are too loose can move and fatigue. Either mistake can lead to a sudden failure of the bolt, causing you to lose control and fall.

If your bike is equipped either with a "threadless" stem, which clamps on to the outside of the steerer tube, or with a "quill" stem, which clamps inside the steerer tube by way of an expanding binder bolt. If you aren't absolutely sure which type of stem your bike has, ask your retailer. Some bicycles are equipped with an adjustable angle stem. If your bicycle has an adjustable angle stem, ask your retailer to show you how to adjust it. Always tighten fasteners to the correct torque.

C. Handlebar Height & Angle

Your bike is delivered with "threadless" stem exclusively. If your handlebar has a "threadless" stem (fig. 6) your retailer may also require adjustments to the bicycle’s controls. Your retailer can also change the angle of the handlebar or bar end extensions.

WARNING

Always tighten fasteners to the correct torque. Bolts that are too tight can stretch and deform. Bolts that are too loose can move and fatigue. Either mistake can lead to a sudden failure of the bolt, causing you to lose control and fall.

The angle of the brake and shift control levers and their position on the handlebars can be changed. Ask your retailer to make the adjustments for you. If you choose to make your own control lever angle adjustment, be sure to re-tighten the clamp fasteners to the recommended torque (Appendix C or the manufacturer's instructions).

WARNING

The shorter the brake lever reach, the more critical it is to have correctly adjusted brakes, so that full braking power can be applied within available brake lever travel. Brake lever travel insufficient to apply full braking power can result in loss of control, which may result in serious injury or death.

An insufficiently tightened stem clamp bolt, handlebar clamp bolt or bar end extension clamping bolt may compromise steering action, which could allow you to lose control and fall. Always tighten fasteners to the correct torque. A correctly tightened stem clamp bolt, handlebar clamp bolt or bar end extension clamping bolt can lead to a sudden failure of the bolt, causing you to lose control and fall.

Some people have claimed that extended riding with a saddle which is incorrectly adjusted or which does not support your pelvic area correctly can cause the clamp or long-term injury to nerves and blood vessels, or even impotence. If your saddle causes you pain, numbness or other discomfort, listen to your body and stop riding until you see your retailer about saddle adjustment or a different saddle.

Some bicycles are equipped with an adjustable angle stem. If your bicycle has an adjustable angle stem, ask your retailer to show you how to adjust it. Do not attempt to make the adjustment yourself, as changing stem angle may also require adjustments to the bicycle’s controls. Your retailer can also change the angle of the handlebar or bar end extensions.

Do not exceed the number of height adjustment spacers below the stem that were initially provided with the bicycle or recommended by Cervélo. Exceeding the maximum spacer height can result in an insufficiently tightened stem clamp bolt, handlebar clamp bolt or bar end extension clamping bolt which could cause you to lose control and fall.

When making saddle angle adjustments with a single bolt saddle clamp, always check to make sure that the serrations on the mating surfaces of the clamp are not worn. Worn serrations on the clamp can allow the saddle to move, causing you to lose control and fall. Always tighten fasteners to the correct torque. Bolts that are too loose can stretch and deform. Bolts that are too loose can move and fatigue. Either mistake can lead to a sudden failure of the bolt, causing you to lose control and fall.

D. Control Position Adjustments

The angle of the brake and shift control levers and their position on the handlebars can be changed. Ask your retailer to make the adjustments for you. If you choose to make your own control lever angle adjustment, be sure to re-tighten the clamp fasteners to the recommended torque (Appendix C or the manufacturer’s instructions).

E. Brake Reach

Many bikes have brake levers which can be adjusted for reach. If you have small hands or find it difficult to squeeze the brake levers, your retailer can either adjust the reach or fit shorter reach brake levers.

WARNING

The shorter the brake lever reach, the more critical it is to have correctly adjusted brakes, so that full braking power can be applied within available brake lever travel. Brake lever travel insufficient to apply full braking power can result in loss of control, which may result in serious injury or death.

Some people have claimed that extended riding with a saddle which is incorrectly adjusted or which does not support your pelvic area correctly can cause the clamp or long-term injury to nerves and blood vessels, or even impotence. If your saddle causes you pain, numbness or other discomfort, listen to your body and stop riding until you see your retailer about saddle adjustment or a different saddle.

Cervélo bicycles are delivered with "threadless" stems exclusively. If your bike has a "quill" stem, which clamps on to the outside of the steerer tube, or with a "quill" stem, which clamps inside the steerer tube by way of an expanding binder bolt. If you aren't absolutely sure which type of stem your bike has, ask your retailer. Cervélo bicycles are delivered with "threadless" stems exclusively. If your bike has a "threadless" stem (fig. 6) your retailer may also require adjustments to the bicycle’s controls. Your retailer can also change the angle of the handlebar or bar end extensions.

WARNING

Always tighten fasteners to the correct torque. Bolts that are too tight can stretch and deform. Bolts that are too loose can move and fatigue. Either mistake can lead to a sudden failure of the bolt, causing you to lose control and fall.

The angle of the brake and shift control levers and their position on the handlebars can be changed. Ask your retailer to make the adjustments for you. If you choose to make your own control lever angle adjustment, be sure to re-tighten the clamp fasteners to the recommended torque (Appendix C or the manufacturer’s instructions).

WARNING

The shorter the brake lever reach, the more critical it is to have correctly adjusted brakes, so that full braking power can be applied within available brake lever travel. Brake lever travel insufficient to apply full braking power can result in loss of control, which may result in serious injury or death.

Some people have claimed that extended riding with a saddle which is incorrectly adjusted or which does not support your pelvic area correctly can cause the clamp or long-term injury to nerves and blood vessels, or even impotence. If your saddle causes you pain, numbness or other discomfort, listen to your body and stop riding until you see your retailer about saddle adjustment or a different saddle.
2. Track models utilize either a hollow axle with a shaft ("skewer") running through it which has a nut on one end and a fitting for a hex key, lock lever or other tightening device on the other (through bolt, fig. 8), or;

3. Other Track models utilize hex nuts or hex key bolts which are threaded on to or into the hub axle (bolt-on wheel, fig. 9)

If you choose to perform any assembly operations yourself, ensure that all operations are done in accordance with the specific assembly instructions published by the component manufacturer. These assembly instructions are included in the bike box provided to your retailer. Alternatively, assembly instructions are usually posted on the component manufacturer’s websites, or are available from their service departments. Please ensure that you locate and follow the directions for your particular component model.

A. Wheels

Bicycle wheels are designed to be removable for easier transportation and for repair of a tire puncture. In most cases, the wheel axles are inserted into slots, called “dropouts” in the fork and frame, but some bicycles use what is called a “through axle” wheel mounting system.

NOTE: If you have a bicycle equipped with through axle front or rear wheels, make sure that your retailer has given you the manufacturer’s instructions, and follow those when installing or removing a through axle wheel. If you don’t know what a through axle is, ask your retailer.

Cervélo bicycles utilize wheels that are secured in one of four ways:

1. Quick Release models utilize a hollow axle with a shaft ("skewer") running through it which has an adjustable tension nut on one end and an over-center cam on the other (cam action system, fig. 7a & b)

2. Track models utilize either a hollow axle with a shaft ("skewer") running through it which has a nut on one end and a fitting for a hex key, lock lever or other tightening device on the other (through bolt, fig. 8), or;

3. Other Track models utilize hex nuts or hex key bolts which are threaded on to or into the hub axle (bolt-on wheel, fig. 9)

4. Through Axle models utilize a large diameter axle paired with a cam action tension release lever to clamp the bike’s wheel in place (fig. 10 & b). Cervélo has two variants of through axle designs:

a) Cervélo Through Axle models utilize a 12mm diameter threaded axle which threads into the opposite dropout, and is tensioned with the cam action lever (fig. 12, 13, 16 & 17)

b) Cervélo Rapid Axle models utilize a 12mm diameter axle with a T-shaped end which slots into the opposite dropout, is rotated into locked position, and is tensioned with the cam action lever (fig. 14, 15, 18 & 19)

It's important to your safety, performance and enjoyment to understand how things work on your bicycle. We urge you to ask your retailer how to do the things described in this section before attempting them yourself, and that you have your retailer check your work before you ride the bike. If you have even the slightest doubt as to whether you understand something in this section of the Manual, talk to your retailer. See also Appendix A, B, & C.

Cervélo bicycles are shipped from the factory to the retailer only partially assembled. Your retailer will complete the assembly of the bicycle, and perform any adjustments required to make it fit you. It is strongly recommended that you allow your retailer to perform the assembly and fitting operations, as it requires specific knowledge of each part, appropriate tools, and understanding of the interactions of various materials. Your bicycle is a high performance machine, much like a racing car, and as such requires skilled maintenance in order to function safely and effectively.

Your retailer will perform the following assembly operations before your bicycle is delivered to you:

1. Fork steerer cut to appropriate length.
2. Headset & stem installed and adjusted.
3. Handlebars clamped into stem.
4. Brakes/shifters levers installed onto handlebars.
5. Front brake installed on fork.
7. Brakes and derailleurs adjusted.
8. Handlebars wrapped with bar tape & plugged.
10. Wheels installed.
11. Pedals (of your choice) installed.

Cervélo has two variants of through axle designs:

a) Cervélo Through Axle models utilize a 12mm diameter threaded axle which threads into the opposite dropout, and is tensioned with the cam action lever (fig. 12, 13, 16 & 17)

b) Cervélo Rapid Axle models utilize a 12mm diameter axle with a T-shaped end which slots into the opposite dropout, is rotated into locked position, and is tensioned with the cam action lever (fig. 14, 15, 18 & 19)
Proper torque when threading the axle into the dropout is needed to mold, cast or machine the outer faces of the front fork dropouts. Cervélo rim brake or track bicycles will utilize a secondary retention device to reduce the risk of the wheel disengaging from the fork if the wheel is incorrectly secured. Secondary retention devices are not a substitute for correctly securing your front wheel. Most bicycles have front forks which utilize a secondary wheel retention device to reduce the risk of the wheel disengaging from the fork. Removing or disabling the secondary retention device may also void the warranty. Secondary retention devices are not a substitute for correctly securing your wheel. Failure to properly secure the wheel can cause the wheel to wobble or disengage, which could cause you to lose control and fall, resulting in serious injury or death.

**1. Front Wheel Secondary Retention Devices**

Most bicycles have front forks which utilize a secondary wheel retention device to reduce the risk of the wheel disengaging from the fork if the wheel is incorrectly secured. Secondary retention devices are not a substitute for correctly securing your front wheel.

Cervélo rim brake or track bicycles will utilize a secondary retention device or a traditional cam action mechanism. An alternative type of secondary retention device that is utilized on other bicycles is a clip-on type which the manufacturer adds to the front wheel hub or front fork. Ask your retailer to explain the particular secondary retention device on your bike.

**WARNING**

Riding with an improperly secured wheel can allow the wheel to wobble or fall off the bicycle which can cause serious injury or death. Therefore, it is essential that you:

1) Ask your retailer to help you make sure you know how to install and remove your wheels.

2) Understand and apply the correct technique for clamping your wheel in place.

3) Each time, before you ride the bike, check that the wheel is securely clamped. The clamping action of a correctly secured wheel must emboss the surfaces of the dropouts.

2. Wheels with Cam Action Systems

There are currently two types of cam action wheel retention mechanisms: the traditional over-center cam (fig. 7a) and the cam-and-cup system (fig. 7b). Both use an over-center cam action to clamp the bike’s wheel in place. Your bicycle may have a cam-and-cup front wheel retention system and a traditional rear wheel cam action system.

**a) Adjusting the traditional cam action mechanism (fig. 7a)**

The wheel hub is clamped in place by the force of the over-center cam pushing against one dropout and pulling the tension adjusting nut, by way of the lever, against the other dropout. The amount of clamping force is controlled by the tension adjusting nut. Turning the tension adjusting nut clockwise while keeping the cam lever from rotating reduces clamping force; turning it counterclockwise while keeping the cam lever from rotating increases clamping force. Less than half a turn of the tension adjusting nut reduces clamping force. More than half a turn increases clamping force; turning it counterclockwise while keeping the cam lever from rotating increases clamping force.

**b) Adjusting the cam-and-cup mechanism (fig. 7b)**

The cam-and-cup system on your front wheel will have been correctly adjusted for your bicycle by your retailer. Ask your retailer to check the adjustment every six months. Do not use a cam-and-cup front wheel on any bicycle other than the one for which your retailer adjusted it.

**c) Adjusting through axle mechanisms (fig. 10a & b)**

Holding the nut with one hand and turning the lever like a wing nut (but not in the slotted position), it can be rotated into any angle and set in that position by closing the lever without affecting the threading of the axle.
Removing a Disc Brake or Rim Brake Front Wheel

1. If your bike has rim brakes, disengage the brakes quickly release mecha-

2. If you have a cam action front wheel retention, move the cam lever from the

3. With a traditional cam action system, move the cam lever upwards and swing

4. With a through-bolt or bolt-on system, tighten the fasteners to

CAUTION

Securely clamping the wheel takes considerable force. If you can fully

CAUTION

Your bike has a disc brake, exercise care in touching the rotor or caliper.

Disc rotors have sharp edges, and both rotor and caliper can get very hot
during use.

If your bike has a disc brake, take care to ensure that no oils or related
products (hydraulic fluid, chain lube, finger oils) contact the brake pad
insertion/outset, and at the same time centering the wheel rim in the fork.

You may need to tap the top of the wheel with the palm of your hand to
release the wheel from the front fork.

B. Installing a Disc Brake or Rim Brake Front Wheel

1. If your bike has a cam-and-cup system: holding the cam lever in the

2. With the steering fork facing forward, insert the wheel between the fork

3. With a clip-on type secondary retention device, engage it.

4. With a traditional cam action mechanism: holding the cam lever in the

CAUTION

If your bike is equipped with a front disc brake, be careful not to damage
the disc, caliper or brake pads when re-inserting the disc into the caliper.
Never activate a disc brake's control lever unless the disc is correctly
inserted in the caliper. See also Section 4.8.

Cervélo Rapid Axle:

The wheel hub is clamped in place by inserting the axle into the opposite
dropout, aligning the T-End of the axle with the insert. The axle is rotated 90°
laterally within the fork and potentially bend the brake rotor or contact
the fork legs with the edge of the brake rotor.

If your bike has a disc brake, take care to ensure that no oils or related
products (hydraulic fluid, chain lube, finger oils) contact the brake pad
insertion/outset, and at the same time centering the wheel rim in the fork.

You may need to tap the top of the wheel with the palm of your hand to
release the wheel from the front fork.

b) With a through-bolt or bolt-on system, tighten the fasteners to
the torque specifications in Appendix C or the hub manufacturer's
instructions.

5. If your bike has the Cervélo Through Axle mechanism, move the preload
lever to the OPEN position and rotate it to engage the slotted OPEN
position (fig. 1a). Carefully insert the wheel between the fork blades,
ensuring that the disc rotor properly slots between the brake pads as
it slots into the caliper until the hollow axle lines up with the holes in the
fork dropouts. The preload lever should be on the right side of the
bicycle. Slide the through axle through the fork dropout and wheel hub
until it contacts the dropout on the left side of the fork. Visually align
the through axle with the dropout hole on the left side of the fork, and
the preload lever clockwise to thread the axle into the dropout (fig. 12).
Continue to tighten until the threads are fully engaged in the area of the
fork dropouts and no adjustment should be required.

The lever should now be parallel to the fork blade and curved toward the
wheel.

If your bike uses a cam action system, move the cam lever upward and
engages it into the CLOSED position (fig. 12).  If your bike has a clip-on type
secondary retention device, engage it.

If your bike has a cam action front wheel retention, move the cam lever so
that it curves away from the wheel (fig. 7b). This is the OPEN position.
If your bike has a through bolt or bolt-on front wheel retention, go to the
next step.

With a traditional cam and-cup system: the nut and cup (fig. 7b) will have
snapped into the recessed area of the fork dropouts and no adjustment
should be required.

While pushing the wheel firmly to the top of the slots in the fork drop-
outs, and at the same time centering the wheel rim in the fork.

a) With a cam action system, move the cam lever upward and
engages it into the CLOSED position (fig. 7a & b). The lever should now be
parallel to the fork blade and curved toward the wheel. To apply
efficient clamping force, you should have to wrap your fingers around
the fork blade for leverage, and the lever should leave a clear imprint
in the palm of your hand.

b) With a through-bolt or bolt-on system, tighten the fasteners to
the torque specifications in Appendix C or the hub manufacturer's
instructions.

If your bike has a disc brake, exercise care in touching the rotor or caliper.
Disc rotors have sharp edges, and both rotor and caliper can get very hot
during use.

If your bike has a disc brake, take care to ensure that no oils or related
products (hydraulic fluid, chain lube, finger oils) contact the brake pad
insertion/outset, and at the same time centering the wheel rim in the fork.

You may need to tap the top of the wheel with the palm of your hand to
release the wheel from the front fork.

b) With a through-bolt or bolt-on system, tighten the fasteners to
the torque specifications in Appendix C or the hub manufacturer's
instructions.

If your bike has a disc brake, take care to ensure that no oils or related
products (hydraulic fluid, chain lube, finger oils) contact the brake pad
insertion/outset, and at the same time centering the wheel rim in the fork.

You may need to tap the top of the wheel with the palm of your hand to
release the wheel from the front fork.

b) With a through-bolt or bolt-on system, tighten the fasteners to
the torque specifications in Appendix C or the hub manufacturer's
instructions.

If your bike has a disc brake, take care to ensure that no oils or related
products (hydraulic fluid, chain lube, finger oils) contact the brake pad
insertion/outset, and at the same time centering the wheel rim in the fork.

You may need to tap the top of the wheel with the palm of your hand to
release the wheel from the front fork.
6. If your bike has the Cervélo Rapid Axle mechanism, move the preload lever to the fork blade and curved toward the wheel.

7. With a through-bolt or bolt-on system, tighten the fasteners to the torque specifications in Appendix C or the hub manufacturer's instructions. If your bike is equipped with a rear disc brake, be careful not to damage the disc, caliper or brake pads when re-inserting the disc into the caliper. Never activate a disc brake's control lever unless the disc is correctly installed in the caliper.

8. If your bike has the Cervélo Rapid Axle mechanism, move the preload lever from the CLOSED position to the OPEN position (fig. 11b) and rotate the lever clockwise a quarter turn and try again. On the Cervélo Through Axle mechanism, move the preload lever from the CLOSED position to the OPEN position, then turn the preload lever clockwise until the threads on the right side are fully disengaged from the right side dropout. Hold the wheel steady with one hand, and pull the axle through the hub and the left dropout to fully remove it from the wheel. If your bike uses the Cervélo Rapid Axle mechanism, move the preload lever from the CLOSED position to the OPEN position (fig. 11b) and rotate the lever 90° counterclockwise to align the T-end with the insert slot. Pull the axle straight out through both dropouts to release the wheel.

9. Spin the wheel to make sure that it is centered in the frame and clear of the brake pads; then squeeze the brake lever and make sure that the brakes are operating correctly. If your bike has a multi-speed brake with a derailleur gear system: shift the rear derailleur to high gear (the smallest, outermost sprocket).

D. Installing a Disc Brake or Rim Brake Wheel

1. With a cam action system, move the cam lever to the OPEN position (see fig. 7 a & b). The lever should be on the side of the wheel opposite the derailleur and freewheel sprocket. If your bike has the Cervélo Through Axle mechanism, move the preload lever to the CLOSED position and rotate it to engage the slotted OPEN position (fig. 11a). If your bike has the Cervélo Rapid Axle mechanism, move the preload lever to the OPEN position (fig. 11b). The preload lever should be on the left side of the bicycle.

2. On a derailleur bike, make sure that the rear derailleur is still in its outermost, high gear, position; then pull the derailleur body back with your right hand. Put the chain on top of the smallest freewheel sprocket. If your bike has a derailleur gear system: pull the derailleur body back with your right hand. Put the chain on the rear sprocket. Then, insert the wheel into the frame dropouts and pull it all the way in to ensure that there is plenty of slack in the chain. Put the chain on the front sprocket, so that the wheel will move freely when you pedal.

3. On single-speed, remove the chain from the front sprocket, so that the wheel will move freely when you pedal. Then, insert the wheel into the frame dropouts and pull it all the way in to ensure that the drop rotor will spin around the rear axle without touching the chainstays or seatstays with the edge of the rotor.

WARNING

Securing the wheel with a cam action retention device or through axle mechanism takes considerable force. You can fully close the cam/preload lever without wrapping your fingers around the fork blade for leverage, the lever does not leave a clear imprint in the palm of your hand, and the serrations on the wheel fastener are not visible. If a through-bolt (fig. 7a) or through axle (fig. 3a) mechanism is used, move the preload lever from the CLOSED position to the OPEN position (fig. 11b) and rotate the lever clockwise a quarter turn; then try again. On the Cervélo Through Axle mechanism, move the preload lever to the OPEN position (fig. 7b). With a through bolt or bolt on mechanism, return the lever to the OPEN position, rotate to engage the slotted OPEN position, and turn the preload lever clockwise until the threads on the right side are fully disengaged from the right side dropout. Hold the wheel steady with one hand, and pull the axle through the hub and the left dropout to fully remove it from the wheel.

NOTE: See also the first WARNING in this Section, p. 21.
that the disc rotor properly slots between the brake pads, and line up
the hollow axle with the dropout holes.
5. With a cam action system, move the cam lever upwards and swing it
into the CLOSED position (fig. 7 & b). The lever should now be parallel
to the seat stay or chain stay and curved toward the frame.
6. With a through-bolt mechanism, tighten the fasteners to the
torque specifications in Appendix C or the hub manufacturer’s instruc-
tions.
7. With the Cervélo Through Axle mechanism, slide the through axle
through the left dropout and wheel hub until it contacts the dropout
on the right side of the frame. Visually align the through axle with the
dropout hole on the right side of the frame, and turn the preload lever
clockwise to thread the axle into the dropout. Continue to tighten
until the threads are fully engaged in the right side dropout (fig. 16). Move
the preload lever into the CLOSED position (fig. 17). The lever should
now be parallel to the seat stay or chain stay and curved toward the frame.
7. If, on a traditional cam action system, the lever cannot
be pushed all the way to a position parallel to the seat stay or
chain stay, return the lever to the OPEN position. Then
turn the tension adjusting nut clockwise one-quarter-
turn and try tightening the lever again. If, on the Cervélo
Through Axle mechanism, the preload lever cannot be pushed all
the way to a position parallel to the fork blade, return the
lever to the OPEN position, rotate to engage the slotted OPEN
position, and turn the preload lever clockwise one-quarter-
turn and try closing the lever again. On the Cervélo
Rapid Axle mechanism, return the lever to the OPEN
position, and turn the preload nut clockwise one-quarter turn and try
closing the lever again. See also the first WARNING in this
Section (p. 21).
8. If your bike has the Cervélo Rapid Axle mechanism, move the preload
lever to the OPEN position. Carefully insert the wheel between the
dropouts, ensuring that the disc rotor properly slots between the brake
pads as it slots into the caliper until the hollow axle lines up with the
holes in the fork dropouts. The preload lever should be on the left side
of the bicycle. Slide the axle through the dropout and wheel hub with
the arrows facing up until it contacts the dropout on the right side of
the bike. Visually align the T-End of the through axle with the insert slot on
the right side of the bike, then turn the preload lever clockwise 90° until
the T-End is stopped by the insert (fig. 18). Move the preload lever into
the CLOSED position (fig. 19). The lever should now be parallel to the
chain stay and curved toward the frame.
9. If you disengaged the brake quick-release mechanism in 3. c. (2) above,
re-engage it to restore correct brake pad-to-rim clearance.
10. Visually check that the wheel is installed correctly. Spin the wheel to
make sure that it is centered in the frame and clears the brake pads;
then squeeze the brake lever and make sure that the brakes are operat-
ing correctly.
11. To apply enough clamping force, you should have to wrap your fingers around
the fork blade for leverage, and the lever should leave a clear
imprint in the palm of your hand.
12. On a through-bolt or bolt-on system, tighten the fasteners to the
torque specifications in Appendix C or the hub manufacturer’s instruc-
tions.
B. Brakes

There are three general types of bicycle brakes: rim brakes, which operate by squeezing the wheel rim between two brake pads; disc brakes, which operate by squeezing a rotor mounted disc between two brake pads; and internal hub brakes. All three can be operated by way of a handlebar mounted lever. On some models of bicycle, the internal hub brake is operated by pedaling backwards. This is called a Coaster Brake. Cervélo disc brake equipped bikes all utilize through axles, which eliminates the need for a brake quick release mechanism for wheel removal.

**WARNING**

1) Riding with improperly adjusted brakes, worn brake pads, or wheels on which the rim wear mark is visible is dangerous and can result in serious injury or death.

2) Applying brakes too hard or too suddenly can lock up a wheel, which could cause you to lose control and fall. Sudden or excessive application of the front brake may pitch the rider over the handlebars, which may cause you to lose control and fall. Sudden or excessive application of the front brake may pitch the rider over the handlebars, which may cause you to lose control and fall.

3) Some bicycle brakes, such as disc brakes (fig. 20) and linear-pull brakes (fig. 21), are extremely powerful. Take extra care in becoming familiar with their performance characteristics. If replacing worn or damaged parts, use only manufacturer-approved genuine replacement parts.

4) Some bicycle brakes are equipped with a brake force modulator, a small, cylindrical device through which the brake control cable runs and which is designed to provide a more progressive application of braking force. A modulator makes the initial brake lever force more gentle, allowing you to adjust the amount of force. A modulator makes the initial brake lever force more gentle, allowing you to adjust the amount of force.

5) If replacing worn or damaged parts, use only manufacturer-approved genuine replacement parts.

6) See the brake manufacturer’s instructions for operation and care of the brakes, and exercise particular care when using them.

7) If replacing worn or damaged parts, use only manufacturer-approved genuine replacement parts.

8) Brakes are designed to control your speed, not just to stop the bike.

9) Maximum braking force for each wheel occurs at the point just before the wheel “locks up” (stops rotating) and starts to skid. Once the tire skids, the tires lose their ability to grip. The way to maintain control on loose or wet surfaces is to go more slowly.

10) Take care to ensure that no oils or related products (hydraulic fluid, chain lube, finger oils) contact the brake pad materials. Contamination of brake pads by oil-based materials can significantly reduce the effectiveness of your braking system.

11) Warning: the term “lockup” refers to a point on a wheel where there is no traffic or other hazards and distractions.

12) When you apply one or both, the bike begins to slow, but your body wants to continue at the speed at which it was going. This causes a transfer of weight to the front wheel (or, under heavy braking, around the front wheel hub area). A wheel with more weight on it will accept greater brake pressure before lockup; a wheel with less weight will lock up with less brake pressure. So, as you ride your bike and your speed increases, you need to shift your body toward the rear of the bike, to transfer weight back on to the rear wheel; and at the same time, you need to both decrease rear braking and increase front braking force. This is even more important on descents, because descents shift weight forward.

13) Two keys to effective speed control and safe stopping are controlling wheel lockup and weight transfer. Practice braking and weight transfer techniques where there is no traffic or other hazards and distractions.

14) Everything changes when you ride on loose surfaces or in wet weather. It will take longer to stop on loose surfaces or in wet weather. Tire adhesion is reduced, so the wheels have less cornering and braking traction and can lock up with less brake force. Moisture or dirt on the brake pads reduces their ability to grip. The way to maintain control on loose or wet surfaces is to go more slowly.

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Ask your retailer to make sure that you understand the way the brake quick release works on your bike (figs. 21, 22, 23 & 24) and check each time you make sure both brakes work correctly before you get on the bike. Cervélo disc brake equipped bikes all utilize through axles, which eliminates the need for a brake quick release mechanism for wheel removal.

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2. How Brakes Work

The braking system of a bicycle is a function of the friction between the braking surfaces. To make sure that you have maximum friction available, check each time to make sure both brakes work correctly before you get on the bike. Cervélo disc brake equipped bikes all utilize through axles, which eliminates the need for a brake quick release mechanism for wheel removal.

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3. Brake Controls & Features

1. Brake Controls & Features

   a. Very important to your safety that you learn and remember which brake lever controls which wheel on your bike. Traditionally, the right brake lever controls the rear brake and the left brake lever controls the front brake; but, to make sure your bike’s brakes are set up this way, squeeze one brake lever and look to see which brake, front or rear, engages. Now do the same with the other brake lever.

   b. Most rim brakes have some form of quick-release mechanism to allow the brake pads to clear the tire when a wheel is removed or reinstalled. When the brake quick release is in the open position, the brakes are inoperative. Make sure that your hands can reach and squeeze the brake levers comfortably. If your hands are too small to operate the levers comfortably, consult your retailer before riding the bike. The lever reach may be adjustable; or you may need a different brake lever design.

   c. Most rim brakes have some form of quick-release mechanism to allow the brake pads to clear the tire when a wheel is removed or reinstalled. When the brake quick release is in the open position, the brakes are inoperative. Make sure that your hands can reach and squeeze the brake levers comfortably. If your hands are too small to operate the levers comfortably, consult your retailer before riding the bike. The lever reach may be adjustable; or you may need a different brake lever design.

   d. Some rim brakes operate by squeezing the wheel rim between two brake pads; disc brakes, which operate by squeezing a rotor mounted disc between two brake pads; and internal hub brakes. All three can be operated by way of a handlebar mounted lever. On some models of bicycle, the internal hub brake is operated by pedaling backwards. This is called a Coaster Brake. Cervélo disc brake equipped bikes all utilize through axles, which eliminates the need for a brake quick release mechanism for wheel removal.

   e. Some rim brakes operate by squeezing the wheel rim between two brake pads; disc brakes, which operate by squeezing a rotor mounted disc between two brake pads; and internal hub brakes. All three can be operated by way of a handlebar mounted lever. On some models of bicycle, the internal hub brake is operated by pedaling backwards. This is called a Coaster Brake. Cervélo disc brake equipped bikes all utilize through axles, which eliminates the need for a brake quick release mechanism for wheel removal.

   f. Some rim brakes operate by squeezing the wheel rim between two brake pads; disc brakes, which operate by squeezing a rotor mounted disc between two brake pads; and internal hub brakes. All three can be operated by way of a handlebar mounted lever. On some models of bicycle, the internal hub brake is operated by pedaling backwards. This is called a Coaster Brake.

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4. Some rim brakes are equipped with a brake force modulator, a small, cylindrical device through which the brake control cable runs and which is designed to provide a more progressive application of braking force. A modulator makes the initial brake lever force more gentle, allowing you to adjust the amount of force.
C. Shifting Gears

Your multi-speed bicycle will have a derailleur drivetrain (see 1. below), an internal gear hub drivetrain or, in some special cases, a combination of the two. Cervélo multi-speed bicycles are delivered with derailleur drivetrains.

1. How a Derailleur Drivetrain Works

If your bicycle has a derailleur drivetrain, the gear-changing mechanism will have:

- A rear cassette or freewheel sprocket cluster
- A rear derailleur
- Usually a front derailleur
- One or two shifters
- One or two front sprockets called chain rings
- A drive chain

a) Shifting gears

There are several different types and styles of shifting controls: levers, twist grips, triggers, combination shift/brake controls and push-buttons. Ask your retailer to explain the type of shifting controls that are on your bike, and to show you how they work.

The vocabulary of shifting can be pretty confusing. A downshift is a shift to a “lower” or “slower” gear, one which is easier to pedal. An upshift is a shift to a “higher” or “faster” gear, which is hard enough for quick acceleration but easy enough to let you start from a stop without pedaling — and with upshifting and downshifting you get a feel for the different gear combinations. At first, practice shifting when there are no obstacles, hazards or other traffic, until you’ve built up your confidence. Learn to anticipate the need to shift, and shift to a lower gear before the hill gets too steep. If you have difficulties with shifting, the problem could be mechanical adjustment. See your retailer for help.

b) Shifting the rear derailleur

The rear derailleur is controlled by the right shifter. The function of the rear derailleur is to move the drive chain from one sprocket to another. The smaller sprockets produce lower gear ratios. Using them requires less pedaling effort, but takes you a greater distance with each revolution of the pedal cranks. The larger sprockets produce higher gear ratios. Pedaling in the higher gears requires greater pedaling effort, but takes you a greater distance with each pedal revolution. Moving the chain from a smaller sprocket to another sprocket results in an upshift. Moving the chain from a larger sprocket to a smaller sprocket results in a downshift. In order for the derailleur to move the chain from one sprocket to another the rider must be pedaling forward.

c) Shifting the front derailleur

The front derailleur, which is controlled by the left shifter, shifts the chain between the larger and smaller chain rings. Shifting the chain onto a smaller chainring makes pedaling easier (a downshift). Shifting to a larger chainring makes pedaling harder (an upshift).

2) Which gear should I be in?

The combination of lowest rear and smallest front gears (fig. 25a) is for the steepest hills. The smallest rear and largest front combination is for the fastest speed (fig. 25b). It is not necessary to shift gears in sequence. Instead, find the “starting gear” which is right for your level of ability — a gear which is hard enough for quick acceleration but easy enough to let you start from a stop without pedaling — and experiment with upshifting and downshifting to get a feel for the different gear combinations. At first, practice shifting when there are no obstacles, hazards or other traffic, until you’ve built up your confidence. Learn to anticipate the need to shift, and shift to a lower gear before the hill gets too steep. If you have difficulties with shifting, the problem could be mechanical adjustment. See your retailer for help.

D. Pedals

1. Toe Overlap

One of the most common problems is toe overlap. This happens when you turn the handlebars to steer while a pedal is in the forward-most position. This is common on small-framed bicycles, and is avoided by keeping the inside pedal up and the outside pedal down when making sharp turns. On any bicycle, this technique will also prevent the inside pedal from striking the ground in a turn.

To keep your toe from catching in the chain, you must keep the inside pedal up and the outside pedal down when making sharp turns. Ask your retailer to help you determine if the combination of frame size, crank arm length and pedal design and shoes you will use results in pedal overlap. Whether you have overlap or not, you must keep the inside pedal up and the outside pedal down when making sharp turns.

2. Some bicycle shoes are equipped with pedals that have sharp and potentially dangerous surfaces. These surfaces are designed to add safety by increasing grip between the rider’s shoe and the pedal. If your bicycle has this type of high-performance pedal, you must take extra care to avoid serious injury from the pedals’ sharp surfaces. Based on your...
4. Clipless pedals (sometimes called “step-in pedals”) are another means of keeping your feet securely in the correct position for maximum pedaling efficiency. They have a plate, called a “cleat,” on the sole of the shoe, which clicks into a mating spring-loaded fixture on the pedal. They only engage or disengage with a very specific motion which must be practiced until it becomes instinctive. Clipless pedals require shoes which do not have the manufacturer’s instructions, see your retailer or contact the manufacturer.

E. Tires & Tubes

1. Tires

Bicycle tires are available in many designs and specifications, ranging from general-purpose designs to tires designed to perform best under very specific weather or terrain conditions. If, once you’ve gained experience with your new bike, you feel that a different tire might better suit your riding needs, your retailer can help you select the most appropriate design.

The size, pressure rating, and on some high-performance tires the specific recommended use, are marked on the sidewall of the tire (see fig. 26). The part of this information which is most important to you is Tire Pressure. It is recommended use, are marked on the sidewall of the tire (see fig. 26). The part of this information which is most important to you is Tire Pressure.

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2. Tire pressure is given either as maximum pressure or as a pressure range. How a tire performs under different terrain or weather conditions depends largely on tire pressure. Inflating the tire to near its maximum recommended pressure gives the lowest rolling resistance; but also produces the harshest ride. High pressures work best on smooth, dry pavement. Very low pressures, at the bottom of the recommended pressure range, give the best performance on smooth, slick terrain such as hard-packed clay, and on deep, loose surfaces such as deep, dry sand. Tire pressure that is too low for your weight and the riding conditions can cause a puncture of the tube by allowing the tire to deform sufficiently to cause a pinched area where the tire meets the rim. The best and safest way to inflate a bicycle tire to the correct pressure is with a bicycle pump which has a built-in pressure gauge.

There is a safety risk in using gas station air hoses or other air compressors. They are not made for bicycle tires. They move a large volume of air very rapidly, and will raise the pressure in your tire very rapidly, which could cause the tube to explode.

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- Pencil type automotive tire gauges can be inaccurate and should not be relied upon for consistent, accurate pressure readings. Instead, use a high quality dial gauge.
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Ask your retailer to suggest the best tire pressure for the kind of riding you will most often do, and have the retailer inflate your tires to that pressure. Then, check inflation as described in Section 1.C so you’ll know how correctly inflated tires should look and feel when you don’t have access to a gauge. Some tires may need to be brought up to pressure every week or two, so it is important to check your tire pressures before every ride.

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Do not use shoes which do not engage the pedals correctly. Practice is required to learn to engage and disengage the foot safely. Until engaging and disengaging becomes a reflex action, the technique requires concentration which can distract your attention and cause you to lose control and fall. Practice the use of toe clips and straps where there are no obstacles, hazards or traffic. Keep the straps loose, and don’t tighten them until your technique and confidence in getting in and out of the pedals warrants it. Never ride in traffic with your toe straps tight.

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WARNING

Getting in and out of pedals with toe clips and straps requires skill which can only be acquired with practice. Until it becomes a reflex action, the technique requires concentration which can distract your attention and cause you to lose control and fall. Practice the use of toe clips and straps where there are no obstacles, hazards or traffic. Keep the straps loose, and don’t tighten them until your technique and confidence in getting in and out of the pedals warrants it. Never ride in traffic with your toe straps tight.

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The best and safest way to inflate a bicycle tire to the correct pressure is with a bicycle pump which has a built-in pressure gauge.

Tire pressure is given either as maximum pressure or as a pressure range. How a tire performs under different terrain or weather conditions depends largely on tire pressure. Inflating the tire to near its maximum recommended pressure gives the lowest rolling resistance; but also produces the harshest ride. High pressures work best on smooth, dry pavement. Very low pressures, at the bottom of the recommended pressure range, give the best performance on smooth, slick terrain such as hard-packed clay, and on deep, loose surfaces such as deep, dry sand. Tire pressure that is too low for your weight and the riding conditions can cause a puncture of the tube by allowing the tire to deform sufficiently to cause a pinched area where the tire meets the rim.

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Some special high-performance tires have unidirectional treads; their tread pattern is designed to work better in one direction than in the other. The sidewall marking of an unidirectional tire will have an arrow showing the correct rotation direction. If your bike has unidirectional tires, be sure that they are mounted to rotate in the correct direction.

2. Tire Valves
There are primarily two kinds of bicycle tube valves: The Schraeder Valve and the Presta Valve. The bicycle pump you use must have the appropriate fitting to the valve stems on your bicycle. Cervélo bicycles are delivered with Presta valves only.

The Schraeder valve (fig. 27a) is like the valve on a car tire. To inflate a Schraeder valve tube, remove the valve cap and clamp the pump head on to the valve head, and inflate. To let air out of a Schraeder valve, you’ll need a Presta adapter (available at your bike shop) which screws on to the valve stem once you’ve freed up the valve.

The Presta valve (fig. 27b) has a narrower diameter and is only found on bicycle tires. To inflate a Presta valve tube using a Presta headed bicycle pump, remove the valve cap; unscrew (counterclockwise) the valve stem lock nut; and push down on the valve stem to free it up. Then push the pump head onto the end of the valve stem. To let air out of a Presta valve, depress the pin in the end of the valve stem with the end of a key or other appropriate object.

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chain’s rollers with a good quality bicycle chain lubricant. Wipe off excess lubricant with a lint-free cloth. Lubrication is a function of climate. Talk to your retailer about the best lubricants and the recommended lubrication frequency for your area.

4. After every long or hard ride or after every 10 to 20 hours of riding:
• Squeeze the front brake and roll the bike forward and back. Everything feel solid? If you feel a clunk with each forward or backward movement of the bike, you probably have a loose headset. Have your retailer check it.
• Lift the front wheel off the ground and swing it from side to side. Feel smooth? If you feel any binding or roughness in the steering, you may have a tight headset. Have your retailer check it.
• Grab one pedal and rock it toward and away from the centerline of the bike; then do the same with the other pedal. Anything feel loose? If so, have your retailer check it.
• Take a look at the brake pads. Starting to look worn or not hitting the wheel rim squarely? Time to have the retailer adjust or replace them.
• Carefully check the control cables and cable housings. Any rust? Kink? Fraying? If so, have your retailer replace them.
• Squeeze each adjoining pair of spokes on either side of each wheel between your thumb and index finger. Do they all feel about the same? If any feel loose, have your retailer check the wheel for tension and trueness.
• Check the tires for excess wear, cuts or bruises. Have your retailer replace them if necessary.
• Check to make sure that all parts and accessories are still secure, and tighten any which are not.

5. As required: If either brake lever fails the Mechanical Safety Check (Section 1.C), don’t ride the bike. Have your retailer check the brakes.
• If the chain won’t shift smoothly and quietly from gear to gear, the derailleur is out of adjustment. See your retailer.

B. If Your Bicycle Sustains An Impact:

First, check yourself for injuries, and take care of them as best you can. Seek medical help if necessary.

Next, check your bike for damage.

After any crash, take your bike to your retailer for a thorough check. Carbon composite components, including frames, wheels, handlebars, stems, cranksets, brakes, etc. which have sustained an impact must not be ridden until they have been disassembled and thoroughly inspected by a qualified mechanic. See also Appendix B, Lifespan Of Your Bike & Its Components.

Check the frame, particularly in the area around all tube joints; the handlebars; the stem; and the seatpost for any deep scratches, cracks or discoloration. These are signs of stress-caused fatigue and indicate that a part is at the end of its useful life and needs to be replaced. See also Appendix B.

A crash or other impact can put extraordinary stress on bicycle components, causing them to fatigue prematurely. Components suffering from stress fatigue can fail suddenly and catastrophically, causing loss of control, serious injury or death.
The various types of Cervélo bikes. You must understand that (1) these types of bikes are intended to give an aggressive racer or competitive cyclist a performance advantage over a relatively short product life, (2) a less aggressive rider will enjoy longer frame life, (3) you are choosing light weight (shorter frame life) over more frame weight and a longer frame life, (4) you are choosing light weight over more dent resistant or rugged frames that weigh more. All frames that are very light need frequent inspection. These frames are hazardous. Using your bike the wrong way is dangerous.

Customer Service about what components are appropriate for your bicycle. If you have questions about your bike’s weight limit, consult your retailer or Cervélo Customer Service about what components are appropriate for your bicycle. To be ridden on paved roads only.

Rider Luggage* Total lbs / kg lbs / kg lbs / kg
194 / 88 1 1 / 5 220.5 / 100

*Seat bag / water bottles / bento bag / handlebar bottle / storage mounts only

NOTE: All Cervélo bicycles are tested to a maximum combined bicycle/rider/luggage weight of 300kg. Components have different weight limits, and if replaced can alter the maximum safe bike weight limit. Consult your retailer or Cervélo Customer Service about what components are appropriate for your bicycle.

The lifespan of your bicycle & its components
1. Nothing Lasts Forever, including your bike

When the useful life of your bike or its components is over, continued use is hazardous.

Every bicycle and its component parts have a finite, limited useful life. The length of that life will vary with the construction and materials used in the frame and components; the maintenance and care the frame and components receive over their life; and the type and amount of use to which the frame and components are subjected. Use in competitive events, trick riding, ramp riding, jumping, aggressive riding, riding on severe terrain, riding in severe climates, riding with heavy loads, commercial activities (including messenger service), and repeated high-speed jumping can dramatically shorten the life of the frame and components. Any one or a combination of these conditions may result in an unpredictable failure.

All aspects of use being identical, lightweight bicycles and their components last longer than the higher performance bicycles and their components. In selecting a lightweight bicycle or components you are making an investment in standards for a type of activity. The type and amount of use to which the frame and components are subjected, the life of the frame and components, be sure to have it inspected frequently.

You should have your bicycle and its component parts checked periodically by your retailer for indicators of stress and/or potential failure, including cracks, deformation, corrosion, paint peeling, dents, and any other indicators of potential problems, inappropriate use or abuse. These are important safety checks and very important to help prevent accidents, bodily injury to the rider and shortened product life.

The lifespan of your bicycle & its components
Today’s high-performance bicycles require frequent and careful inspection and service. In this Appendix we try to explain some underlying material properties, the science basics and how they relate to your bicycle. We discuss some of the complex factors, which is why we tell you that crashworthiness cannot be calculated in a simplistic answer.

Metals vary widely in their resistance to corrosion. Steel must be protected or it will rust. Aluminum and Titanium quickly develop an oxide film that protects the metal from further corrosion. Both are therefore quite resistant to corrosion. Aluminium is not perfectly corrosion resistant, and particular care must be used where it contacts other metals and galvanic corrosion can occur.

Metals are comparatively ductile. Ductile means bending, buckling and stretching before breaking. Generally speaking, of the common bicycle frame building materials steel is the most ductile, titanium less ductile, carbon fiber (framed bikes) more ductile than steel. Carbon fork and frame may be severely bent and the frame undamaged. Aluminum is less ductile than steel, but you can expect the fork and frame to be bent or buckled. Hit harder and the top tube may be broken in tension and the down tube buckled. Hit harder and the top tube may be broken, the down tube buckled and broken, leaving the head tube and fork separated from the main triangle.

When a metal bike crashes, you will usually see evidence of this ductility in broken metal. Ductile vs. brittle. A ductile material such as aluminum is hard enough the fork or frame may be bent or buckled. On a steel bike, the steel fork may be severely bent and the frame undamaged. Aluminum is less ductile than steel, but you can expect the fork and frame to be bent or buckled. Hit harder and the top tube may be broken in tension and the down tube buckled and broken, leaving the head tube and fork separated from the main triangle.

Metals in density. Density is weight per unit of material. Steel weighs 78 grams/cm³, titanium 4.5 grams/cm³, aluminum 2.75 grams/cm³. Contrast these numbers with carbon fiber composite at 1.45 grams/cm³.

Metals are subject to fatigue. With enough cycles of use, at high enough loads, metals will eventually develop cracks that lead to failure. It is very important that you know how the Basics of Metal Fatigue below.

Fatigue is the term used to describe accumulated damage to a part caused by repeated loading. To cause fatigue damage, the load the part receives must be great enough. A crack, often used example is bending a paper clip back and forth (repeated loading) until it breaks. This simple definition will help you understand that fatigue has nothing to do with time or age. A bicycle in a garage does not fatigue. Fatigue happens only through use.

So what kind of "damage" are we talking about? On a microscopic level, a crack forms in a highly stressed area. As the load is repeatedly applied, the crack grows. At some point the crack becomes visible to the naked eye. Eventually it becomes so large that the part is too weak to carry the load that it could carry without the crack. At that point there can be a complete and immediate failure of the part.

One design can use a material that is so strong that fatigue life is nearly infinite. This requires a lot of material and a lot of weight. Any structure that must be light and strong will have a finite fatigue life. Aircraft, racing motorcycles all have parts with finite fatigue lives. If you wanted a bicycle with an infinite fatigue life, it would weigh far more than any bicycle sold today. So we all make a trade-off: the wonderful, lightweight performance we want requires that we inspect the structure.

Periodic, more detailed inspection of your bicycle is important. How often this more detailed inspection is needed depends upon you. Your retailer will help you decide what frequency of inspection and service is appropriate for how and where you use your bike.
On a cracked surface, there are two possibilities. The crack may be a small one. Riding a cracked frame, fork or component could lead to complete failure, with risk of serious injury or death. Do not ride a bicycle or component with any crack, bulge or dent, even a small one. Riding a cracked frame, fork or component could lead to complete failure, with risk of serious injury or death.

What To Look For

1. Clean riding environment
2. No "hits", crashes, jumps, other "shots" to the bike
3. Low mileage
4. Lower body weight

Simple Rule 1: Clean your bike, lubricate your bike, protect your bike from salt, remove any salt as soon as you can.

Simple Rule 2: Clean your bike, lubricate your bike, protect your bike from salt, remove any salt as soon as you can.

Simple Rule 3: Impact and investigate staining to see if it is associated with a crack.

Simple Rule 4: Do not scratch, gouge or score any surface. If you do, pay frequent attention to this area or replace the part.

Simple Rule 5: Find the source of any noise. It may not be a crack, but the cause of the noise should be fixed promptly.

Fatigue is not a perfectly predictable science, but here are some general factors to help you and your retailer determine how often your bicycle should be inspected. The more you fit the "shorten product life" profile, the more frequently you need to inspect. The more you fit the "lengthen product life" profile, the less frequent your need to inspect.

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Factors that shorten product life:
- Hard, harsh riding style
- "Hits", crashes, jumps, other "shots" to the bike
- High mileage
- Stronger, more fit, more aggressive rider
- Corrosive environment (salt, acid rain, winter road salt, accumulated sweat)
- Presence of abrasive mud, dirt, sand, soil in riding environment

Factors that lengthen product life:
- Smooth, fluid riding style
- No "hits", crashes, jumps, other "shots" to the bike
- Low mileage
- Lower body weight

Some cracks (particularly larger ones) may make cracking noises as you ride. Think about such a noise as a serious warning signal. Note that a well-maintained bicycle will be very quiet and free of creaks and squeaks.

Simple Rule 1: If you find crack, replace the part.

Simple Rule 2: Clean your bike, lubricate your bike, protect your bike from salt, remove any salt as soon as you can.

Simple Rule 3: Impact and investigate staining to see if it is associated with a crack.

Simple Rule 4: Do not scratch, gouge or score any surface. If you do, pay frequent attention to this area or replace the part.

Simple Rule 5: Find the source of any noise. It may not be a crack, but the cause of the noise should be fixed promptly.

In most cases a fatigue crack is not a defect. It is a sign that the part has been worn out, a sign the part has reached the end of its useful life. When your tire cars wear down to the point that the tread bars are contacting the road, those tires are worn out and the tread bar says "time for replacement." When a metal part shows a fatigue crack, it is worn out. The crack says "time for replacement."

Note that a well-maintained bicycle makes creaking noise as you ride. Some cracks (particularly larger ones) may make cracking noises as you ride. Think about such a noise as a serious warning signal. Note that a well-maintained bicycle will be very quiet and free of creaks and squeaks.

Stains and discoloration can occur near a crack. Such staining may be a warning sign that a crack exists. What To Look For

Significant scratches, gouges, dents or wearing create starting points for cracks. A cut surface is a focal point for stress. Scoring create starting points for cracks.

Stains and discoloration can occur near a crack. Such staining may be a warning sign that a crack exists. What To Look For

Significant scratches, gouges, dents or wearing create starting points for cracks. A cut surface is a focal point for stress. Scoring create starting points for cracks.

In most cases a fatigue crack is not a defect. It is a sign that the part has been worn out, a sign the part has reached the end of its useful life. When your tire cars wear down to the point that the tread bars are contacting the road, those tires are worn out and the tread bar says "time for replacement." When a metal part shows a fatigue crack, it is worn out. The crack says "time for replacement."

Fatigue is Not a Perfectly Predictable Science

Fatigue is not a perfectly predictable science, but here are some general factors to help you and your retailer determine how often your bicycle should be inspected. The more you fit the "shorten product life" profile, the more frequently you need to inspect. The more you fit the "lengthen product life" profile, the less frequent your need to inspect.

Factors that shorten product life:
- Hard, harsh riding style
- "Hits", crashes, jumps, other "shots" to the bike
- High mileage
- Stronger, more fit, more aggressive rider
- Corrosive environment (salt, acid rain, winter road salt, accumulated sweat)
- Presence of abrasive mud, dirt, sand, soil in riding environment

Factors that lengthen product life:
- Smooth, fluid riding style
- No "hits", crashes, jumps, other "shots" to the bike
- Low mileage
- Lower body weight

Less aggressive rider
- Non-corrosive environment (dry, salt-free air)
- Clean riding environment

WARNING
Do not ride a bicycle or component with any crack, bulge or dent, even a small one. Riding a cracked frame, fork or component could lead to complete failure, with risk of serious injury or death.

B. Understanding Composites

All fibers have a matrix and a fundamental reality of composites. Composite materials constructed of carbon fibers are strong and light, but when crossed or overloaded, carbon fibers do not bend, they break.

What Are Composites?
The term "composites" refers to the fact that a part or parts are made up of different components or materials. You’ve heard the term “carbon fiber bike.” This really means “composite bike.” Carbon fiber composites are typically a strong, light fiber in a matrix of plastic, molded to form a shape. Carbon composites are light relative to metals. The weight of carbon fiber is about 0.9 grams/cm3 (grams per cubic centimeter), Titanium 4.5 grams/cm3, Aluminium 2.75 grams/cm3. Contrast these numbers with carbon fiber composite at 1.45 grams/cm3.

The composites with the best strength-to-weight ratios are made of carbon fiber in a matrix of epoxy plastic. The epoxy matrix bonds the carbon fibers together, transfers load to other fibers, and provides a smooth outer surface. The carbon fibers are the “skeleton” that carries the load.

What Are Composites Used?
Unlike metals, which have uniform properties in all directions (engineers call this isotropic), carbon fibers can be placed in specific orientations to optimize the structure for particular loads. The choice of where to place the carbon fibers gives engineers a powerful tool to create strong, light bicycles. Engineers may also orient fibers to suit other goals such as comfort. There are no limits to the shaping or structuring of a composite bicycle.

Carbon fiber composites are very corrosion resistant, much more so than most metals. Think about carbon fiber or fiberglass boats. Carbon fiber materials have a very high strength-to-weight ratio.

What Are The Limits of Composites?
Well designed “composite” or carbon fiber bicycles and components have long fatigue lives, usually better than their metal equivalents.

While fatigue life is an advantage of carbon fiber, you must still regularly inspect your bike for scratches, gouges, or component failures.

Carbon fiber composites are not ductile. Once a carbon structure is overloaded, it will not bend; it will break. At and near the break, there will be rough, sharp edges and maybe delamination of carbon fiber or carbon fiber fiber layers. There will be no bending, buckling, or stretching.

If You Hit Something or Have A Crash, What Can You Expect From Your Carbon Fiber Bike?

Let’s say you hit a curb, ditch, rock, car, other cyclist or other object. At any speed above a fast walk, your body will continue to move forward, the momentum carrying you over the front of the bike. You cannot and will not stay on the bike and what happens to the frame, fork and other components is irrelevant to what happens to your body.

What should you expect from your carbon frame? It depends on many complex factors. But we can tell you that if the impact is hard enough, the fork or frame may be completely broken. Note the significant difference

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What should you expect from your carbon frame? It depends on many complex factors. But we can tell you that if the impact is hard enough, the fork or frame may be completely broken. Note the significant difference
in behavior between carbon and metal. Even if the carbon frame was twice as strong as a metal frame, once the carbon frame is overloaded it will not bend, it will break completely.

**APPENDIX C**

**FASTENER TORQUE SPECIFICATIONS**

Correct tightening torque of threaded fasteners is very important to your safety. Always tighten fasteners to the correct torque. In case of a conflict between the instructions in this manual and information provided by a component manufacturer, consult with your retailer or with Cervélo Customer Service for clarification. Bolts that are too tight can stretch and deform. Bolts that are too loose can move and fatigue. Either mistake can lead to a sudden failure of the bolt. Always use a correctly calibrated torque wrench to tighten critical fasteners on your bike. Carefully follow the torque wrench manufacturer’s instructions on the correct way to set and use the torque wrench for accurate results. Ensure you read all applicable documentation and have the correct tools prior to attempting any adjustments yourself.

It is recommended that you permit your retailer to perform the following adjustments, as they have the proper tools and experience to ensure it is done correctly. Note that prior to assembling and tightening any bolts, all threads must be generously greased with a quality, non-lithium type grease. Torque wrenches with scale appropriate for the particular torque setting are strongly recommended for tightening all threaded fasteners. Cervélo strongly recommends the use of carbon assembly compound/ friction paste for all areas of clamping to carbon fiber, such as the seatpost to frame, the stem to fork, and the handlebar to stem joints. Benefits to using this paste include reduced corrosion potential, and a decrease in required clamping force needed to support a given load. The paste should be evenly spread on the carbon surface under the clamped area, and the applicable bolt tightened as per the following recommendations.
## Fastener Recommended Torque - Stems

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
<th>Applicable Models</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem to carbon handlebar/basebar</td>
<td>5 Nm</td>
<td>All except S5 Disc, S3, S3 Disc, PSX &amp; PSX</td>
<td></td>
</tr>
<tr>
<td>Rear Pod Clamp</td>
<td>8 Nm</td>
<td>PSX, PS, PSX</td>
<td></td>
</tr>
<tr>
<td>Stem to aluminum handlebar</td>
<td>5 to 6 Nm</td>
<td>R2, R3, R3 Disc, S2, C2, C3</td>
<td></td>
</tr>
<tr>
<td>Stem to aluminum basebar/semitube</td>
<td>8 to 12 Nm</td>
<td>P2, P3</td>
<td></td>
</tr>
<tr>
<td>Stem to fork steerer tube</td>
<td>4 to 5 Nm</td>
<td>All except S3, S3 Disc</td>
<td></td>
</tr>
<tr>
<td>Stem to fork wedge clamp</td>
<td>10 Nm</td>
<td>S3, S3 Disc</td>
<td>Lightly grease bolt</td>
</tr>
<tr>
<td>Stem top cap</td>
<td>5 to 7 Nm</td>
<td>All except S5</td>
<td>Apply enough torque to remove play while ensuring free rotation of the headset</td>
</tr>
<tr>
<td>Stem cover to stem</td>
<td>8 Nm</td>
<td>PS, PSX, PSX</td>
<td></td>
</tr>
<tr>
<td>Preload cap to fork (1 bolt)</td>
<td>1 to 2 Nm</td>
<td>S3 Disc</td>
<td>Apply Loctite 242 to bolt. Use enough torque to remove play while ensuring free rotation of the headset</td>
</tr>
<tr>
<td>Stem preload bolt</td>
<td>1 to 2 Nm</td>
<td>S3, S3 Disc</td>
<td></td>
</tr>
<tr>
<td>Fork topper to fork (3 bolts)</td>
<td>10 Nm</td>
<td>S5 Disc</td>
<td></td>
</tr>
<tr>
<td>Fork topper pinch to Preload cone (1 bolt)</td>
<td>5 Nm</td>
<td>S5 Disc</td>
<td>Apply Loctite 242 to bolts.</td>
</tr>
<tr>
<td>Stem to Fork Tapper (3 bolts)</td>
<td>7 to 8 Nm</td>
<td>S5 Disc</td>
<td>Ensure correct length bolts are used</td>
</tr>
<tr>
<td>Stem to carbon handlebar (4 torx bolts)</td>
<td>6 to 8.5 Nm</td>
<td>S5 Disc</td>
<td>Ensure correct length bolts are used</td>
</tr>
<tr>
<td>Stem to carbon handlebar (4 bolts)</td>
<td>5 to 6 Nm</td>
<td>S3, S3 Disc</td>
<td>Lightly grease bolts</td>
</tr>
</tbody>
</table>

## Fastener Recommended Torque - Seatposts & Saddles

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
<th>Applicable Models</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seatpost Clamp (frame to seatpost)</td>
<td>4 Nm</td>
<td>P5 (Pre-2019)</td>
<td>Use carbon assembly compound between the seatpost and the frame</td>
</tr>
<tr>
<td>Wedge clamp - Rounded front</td>
<td>8 Nm</td>
<td>S2, S3, S3 Disc, S5 Disc, P2, P3, PSX, T5GB, PSX, T5GB</td>
<td></td>
</tr>
<tr>
<td>Wedge clamp - Square front</td>
<td>10 Nm</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Wedge clamp - Square rear</td>
<td>8 Nm</td>
<td>R5, R9 Disc</td>
<td></td>
</tr>
<tr>
<td>27.2mm collar</td>
<td>6 Nm</td>
<td>R2, R3, R3 Disc, C2, C3, C5</td>
<td></td>
</tr>
<tr>
<td>Saddle Clamp (seatpost head bolts) - Aero Tri/TT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saddle clamp bolts</td>
<td>12 Nm</td>
<td>P2, P3, P5 (Pre-2019), PSX, T4, T5GB, PSX, P5</td>
<td></td>
</tr>
<tr>
<td>Seatpost head to rail connector bolt</td>
<td>6 to 7 Nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saddle (seatpost head bolts) - SP17 Aero Carbon</td>
<td></td>
<td></td>
<td>Carbon assembly compound recommended between carbon seatpost &amp; metal clamp</td>
</tr>
<tr>
<td>Saddle clamp bolts - SP18 D-Shape</td>
<td>10 Nm</td>
<td>S2</td>
<td></td>
</tr>
<tr>
<td>2 bolt head</td>
<td>7 Nm</td>
<td>R3, R9 Disc</td>
<td></td>
</tr>
<tr>
<td>Saddle (seatpost head bolts) - SP19 22mm Round</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 bolt head</td>
<td>7 Nm</td>
<td>R3, R3 Disc, C2, C5</td>
<td></td>
</tr>
<tr>
<td>Saddle (seatpost head bolts) - SPS Aero Carbon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 bolt head</td>
<td>8 to 9 Nm</td>
<td>S5 Disc, S3, S3 Disc</td>
<td>Ensure Loctite 242 is used on both bolts (1 is pre-applied, add to other)</td>
</tr>
<tr>
<td>Saddle (seat-post head bolts) - OEM 22mm Round</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 bolt head</td>
<td>8 to 9 Nm</td>
<td>R2, C2</td>
<td>Refer to seatpost manufacturer's instructions</td>
</tr>
</tbody>
</table>
### Fastener Recommended Torque - Aerobars, Brake Levers & Wheels

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
<th>Applicable Models</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component Torque (Nm) Applicable Models Notes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aerobar extensions – Cervélo aerobar</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension Clamp</td>
<td>5 Nm</td>
<td>P5X</td>
<td></td>
</tr>
<tr>
<td>Extension Clamp</td>
<td>4 Nm</td>
<td>P5</td>
<td></td>
</tr>
<tr>
<td>Extension Clamp</td>
<td>3 Nm</td>
<td>P5X</td>
<td></td>
</tr>
<tr>
<td>Arm Pad Carrier</td>
<td>4 Nm</td>
<td>P5, P5X</td>
<td></td>
</tr>
<tr>
<td>Peel Mount to Tilting Adjust Part</td>
<td>6 Nm</td>
<td>P5X</td>
<td></td>
</tr>
<tr>
<td>Tilting Adjust Bolts</td>
<td>6 Nm</td>
<td>P5X, P5X</td>
<td></td>
</tr>
<tr>
<td><strong>Aerobar extensions – aftermarket</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To basbar</td>
<td>To armrest</td>
<td>F2, P3, T4, T5GB</td>
<td>Refer to manufacturer’s instructions for installation of aerobars</td>
</tr>
<tr>
<td><strong>Brake / Shift Levers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road brake/shift levers (to handlebars)</td>
<td>8 to 10 Nm</td>
<td>S0, S1, S3 Disc, S5 Disc, R2, R3, R5 Disc, R6, R5 Disc, C2, C3, C5</td>
<td>Refer to manufacturer’s instructions for installation of brake/shift levers</td>
</tr>
<tr>
<td>TT shift levers</td>
<td>5 to 8 Nm</td>
<td>F2, P3, P5 (Pre-2019), P5X, P5, P3X</td>
<td></td>
</tr>
<tr>
<td>TT brake levers</td>
<td>1.2 to 8 Nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wheels</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick Release</td>
<td>All except T4 &amp; T5GB</td>
<td></td>
<td>Tighten the nut/axle until the lever cannot be closed without wrapping fingers around the frame/fork for leverage, and the lever leaves a clear imprint on the palm of your hand</td>
</tr>
<tr>
<td>Through Axle</td>
<td>Low Profile Through Axle</td>
<td>All except T4 &amp; T5GB</td>
<td>Requires the use of Allen Key type wrench</td>
</tr>
</tbody>
</table>

### Fastener Recommended Torque - Other Parts

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
<th>Applicable Models</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component Torque (Nm) Applicable Models Notes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wheels</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolted – front</td>
<td>25 Nm</td>
<td>S4, T5GB</td>
<td></td>
</tr>
<tr>
<td>Bolted – rear</td>
<td>40 Nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front derailleur hanger</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolts</td>
<td>3 to 4 Nm</td>
<td>C2, C3, C5, P2, P3, P5X, P3X</td>
<td></td>
</tr>
<tr>
<td>2.5 Nm</td>
<td>R5, R5 Disc, R3, R3 Disc, P5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Parts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedals</td>
<td>20 to 35 Nm</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Water bottle cage bolts</td>
<td>2 to 3 Nm</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Rear derailleur hanger bolts</td>
<td>1 Nm</td>
<td>S2, S3, R2, R3, R5</td>
<td>Finger tight prior to rear wheel installation, final torque to approximate torque using open ended wrench</td>
</tr>
<tr>
<td>Rear derailleur hanger fixing nut</td>
<td>12 to 15 Nm</td>
<td>R3 Disc, R3 Disc, C3, C5, S3 Disc, S5 Disc, P5, P3X</td>
<td></td>
</tr>
<tr>
<td>Bottom bracket cable guide lock</td>
<td>1 Nm</td>
<td>P5, P5, P5X, S3, S3 Disc, S5 Disc</td>
<td></td>
</tr>
<tr>
<td>Brake plate bolt</td>
<td>1.5 to 3 Nm</td>
<td>P3, P3</td>
<td></td>
</tr>
<tr>
<td>Computer mount (Bolts for Spoon)</td>
<td>3 Nm</td>
<td>R6 Disc, S2, S3 Disc, P5, P3X</td>
<td>Apply Loctite 242 to bolts</td>
</tr>
<tr>
<td>D2 internal battery mount</td>
<td>2.5 Nm</td>
<td>R2, R3 Disc, R5, R5 Disc, C2, C2, S3 Disc, S5 Disc</td>
<td>Follow front derailleur torque specifications</td>
</tr>
<tr>
<td>Rear Mount D2 Junction Fixing Bolt</td>
<td>1.2 Nm</td>
<td>P5</td>
<td></td>
</tr>
<tr>
<td>Chain catcher mounting bolt</td>
<td>4 Nm</td>
<td>R3, R3 Disc, R5, R5 Disc, C3, C3 Disc, S3 Disc</td>
<td></td>
</tr>
<tr>
<td>Chain catcher connecting bolt</td>
<td>4 Nm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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40

50