ABOUT THIS MANUAL

This manual explains how to ride your new bike safely, and how to maintain your bicycle to keep it operating safely. Every person, prior to riding this bicycle, should read at least Chapter 1 of this manual. Parents should explain Chapter 1 to a child, or anyone else, who is otherwise not able to understand this information.

**Even if you have ridden a bicycle for years, it is important for EVERY person to read Chapter 1 before you ride your new bicycle!**

**Chapter 1** covers safety and bicycle care. Understanding and following this information will help you and your Trek bicycle avoid injury and damage.

**Chapter 2** gives a maintenance schedule for a bicycle under normal riding conditions.

**Chapter 3** gives basic instructions for inspection, lubrication, and adjustment of the parts of a bicycle.

This manual covers all models of Trek bicycles. There are many models, with a variety of equipment, so this manual may contain some information that does not apply to your bike. Some illustrations may vary from the actual bicycles.

Note: For suspension forks and some other parts, we may refer you to the manual supplied by the manufacturer of the part. If you did not receive a referenced manual, download one from the internet, get one from your dealer, or contact us at the phone number or web site listed below and we’ll send you the proper manual.

There may be a more current manual available for your bicycle. For the most current Owner’s Manual, please check the Trek web site. If you have any questions after reading this manual or the information on the Trek web site, consult your Trek dealer. If you have a question or problem, which your Trek dealer can’t handle, contact us using mail, phone, or internet:

**Trek Bicycle Corporation**
**Attn: Customer Service**
**801 W. Madison Street**
**Waterloo, Wisconsin 53594**

(800) 369-8735
http://www.trekbikes.com

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YOUR TREK BICYCLE

Thank you for buying a Trek bicycle. Your bicycle meets the highest safety and performance standards. You have chosen the size and model that meets your needs, and your Trek dealer has assembled and adjusted it.

**Assembly and the first adjustment of your Trek® bicycle take special tools and skills, so this should only be done by an authorized Trek bicycle dealer.**

Your serial number:
The serial number of your bicycle is attached to the underside of the down tube, just ahead of the bottom bracket shell (Figure 1).

Your Trek dealer:

Your dealer's phone:

**Figure 1 Names of frame parts**

<table>
<thead>
<tr>
<th>Frame Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top tube</td>
</tr>
<tr>
<td>(inside the head tube)</td>
</tr>
<tr>
<td>Down tube</td>
</tr>
<tr>
<td>Head tube</td>
</tr>
<tr>
<td>Chain stay</td>
</tr>
<tr>
<td>Fork blade</td>
</tr>
<tr>
<td>Seat stay</td>
</tr>
<tr>
<td>Rear derailleur hanger</td>
</tr>
<tr>
<td>Bottom bracket shell</td>
</tr>
</tbody>
</table>
In this manual, the Warning sign indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

In this manual, the Caution sign indicates a potentially hazardous situation or unsafe practice which, if not avoided, may result in minor or moderate injury.

**Bold letters** indicate important text, or points to note. Examples include **OPEN** or **CLOSED**.

**Italicized letters** indicate a reference to another section within the manual. Examples include the **Wheels** section.

This manual covers the entire line of Trek bicycles, which includes several bicycle types. The following pictures help you identify the type of bicycle you own:

![Figure 2: Road bike](image2)

**Road bike** uses "drop" handlebars, road caliper brakes, and 700c or 650c nominal wheel diameter.

![Figure 3: Touring bike](image3)

**Touring bike** is a road bike designed to carry camping gear. Equipped with large-diameter tires to carry the extra weight, and equipped with high-clearance brakes.

![Figure 4: Cyclo-cross bike](image4)

**Cyclo-cross bike** is a road bike designed to allow skilled riders to ride on non-paved surfaces, equipped with high-clearance brakes.

![Figure 5: Mountain bike](image5)

**Mountain bike** uses a "flat" handlebar and wide, knobby tires. It may have front suspension, rear suspension, or both. It has wheels with a 26" or 29" nominal diameter.

![Figure 6: Juvenile bike](image6)

**Juvenile bike** may look like an adult bike, but scaled to size for a smaller rider; includes BMX, mountain, hybrid, and road styles.

![Figure 7: Hybrid bike](image7)

**Hybrid bike** is a combination of road and mountain designs, this bike uses a "flat" handlebar, but medium-width road tires on 700c nominal wheel diameter.

![Figure 8: Tricycle](image8)

**Tricycle** has three wheels for stability when the young rider is learning about wheeled vehicles.
Wear, fatigue, maintenance, and hard use can decrease the life and safety of your bicycle.

Bicycles are not indestructible: as with anything mechanical, every part of a bicycle has a limited useful life due to wear, stress, and fatigue. Fatigue refers to a low-stress force that, when repeated over a large number of cycles, can cause a material to fail or break. The length of the life of a part varies according to its design, materials, use, and maintenance. Although lighter frames or parts may, in some cases, have a longer life than heavier ones, it should be expected that light weight, high performance bicycles and parts require better care and more frequent inspections.

Regularly inspect your entire bicycle for signs of fatigue stress:
- Dents
- Cracks
- Scratches
- Deformation
- Discoloration

Fatigue can be accelerated by large forces from unsafe riding practices:
- Jumping your bicycle
- Performing bicycle stunts
- Severe off-road riding
- Downhill riding
- Any abnormal bike riding

Carefully inspect your frame and components for signs of fatigue before and after each ride.

**WARNING**

The following riding practices increase your risk of injury:
- Jumping your bicycle
- Performing bicycle stunts
- Severe off-road riding
- Downhill riding
- Any abnormal bike riding

Each of these conditions increases the stress on every part of your bicycle. Frames or parts under high stress may fatigue prematurely, causing them to fail and increasing the risk of injury to the rider. Avoid these riding practices to decrease your risk of injury.
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IMPORTANT!
READ THIS CHAPTER BEFORE YOU RIDE

A bicycle is smaller and less powerful than other vehicles, so safety cannot be overemphasized. This chapter contains suggestions that will help you ride as safely as possible. Read this entire chapter before you ride your new Trek bicycle.

Before your first ride:
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Make sure your bicycle fits you properly.

Your Trek dealer should fit you with the proper size of bicycle.

Make sure there is adequate top tube clearance.

There should be at least one inch (25mm) clearance between the top tube and the rider when standing over the bicycle (Figure 1.1). For mountain bikes, two to three inches (50-75mm) clearance is recommended.

Some models have maximum weight limits:
- Tricycle: 80lbs. (36kg.)

Adjust the seat and handlebar.

The seat and handlebars may be adjusted to offer the best comfort and performance. Before making these adjustments, refer to Chapter 3.

Know how your bicycle performs.

The features of your bicycle, if misused, may cause you to lose control of the bike. These features give you better comfort, control, pedaling efficiency, and stopping power.

Practice at slow speeds first.

Before riding fast or in more difficult conditions, learn the function and performance of all the mechanisms of your bike by riding at slower speeds in a flat, empty parking lot.

If you want your bicycle to perform differently, or if you have special needs that require different parts for the safe operation of your bike, consult your Trek dealer. As an example, the stopping power on Trek bikes varies according to the intended use of the bike. If you would like your bike to have more, or less, stopping power, consult your Trek dealer about brake adjustments or other brake options for your bicycle.

⚠️ WARNING

Mis-use of the braking system, including over-use of the front brake, can cause you to lose control and fall. Avoid improper braking by understanding and practicing proper application of your brakes as explained on page 12 under ‘Use your brakes carefully’ and ‘Be careful when riding in wet conditions.’
Avoid shimmy or front-wheel wobble.

In very rare cases some riders, such as heavier riders on larger bikes, may experience a “shimmy” or “harmonic oscillation” or “frame vibration” at certain speeds. Experts disagree on what can cause a shimmy, but some believe it may be caused by a loose headset, improper spoke tension, or frame alignment. Riding “no-hands,” or front wheel impact, are among other possible causes. If you believe you are experiencing a shimmy, slow down immediately and take your bicycle directly to a Trek dealer for inspection and repair.

WARNING

Contact between your foot or toe-clip and the front wheel or fender can cause you to lose control and fall. Avoid pedaling when turning slowly.

Make sure accessories are compatible and safe.

To make your bicycle more personally useful, you may choose to change parts or add accessories. Not all accessories are compatible or safe. If you are unsure whether a part is appropriate or safe, consult your Trek dealer.

CAUTION

Improper components or improper assembly can place unknown stress on your bike or components. Stress can lead to failure, which can cause you to lose control and fall. Before adding or changing any part of your bike, consult your Trek dealer.
Before each ride, check your bike and its components against the following checklist. The following information explains how to perform these checks. This is not a comprehensive maintenance program. If you are not certain if your bike has a problem, take your bike to your Trek dealer for service.

Checklist: Before every ride

☐ Check that your wheels are straight.
☐ Check your tire inflation.
☐ Check your brakes.
☐ Check attachment of both wheels.
☐ Check your handlebars and stem for signs of stress or fatigue.
☐ Check your suspension adjustment.

**CAUTION**

A bicycle that does not work properly can cause you to lose control and fall. Inspect the entire bicycle thoroughly before every ride, and do not ride it until any problem has been corrected.

☐ Check that your wheels are straight.

Spin each wheel and watch the rim as it passes through the brake pads or the frame. If the rim wobbles, up and down or from side to side, take your bike to your Trek dealer for service.

☐ Check your tire inflation.

Inflate your tires to the air pressure recommended on the tire sidewalls (Figure 1.3). Some tires offer a range of inflation. When inflating a tire, consider the weight of the rider (and any load). Within the range, higher pressure usually gives the best performance on hard surfaces like pavement, while lower pressure works best for off-road riding.

**CAUTION**

A gas station hose may inflate a bicycle tire too rapidly, and the indicated pressure is often inaccurate, causing the tire to fail. Use a hand-operated pump with an appropriate gauge.
Check your brakes.

Trek bikes come with a variety of types of brakes:

- **Hand-rim brakes**, where a brake lever, connected to the brake by a cable, causes the brake pads to squeeze the rim.

- **Disc brakes**, where a hand lever connected to the brake squeezes a disc mounted on the wheel hub.

- **Internal drum or roller brakes**, where a hand lever operates a brake inside the hub.

- **Coaster brakes**, where the brake is engaged by pedaling backwards.

Follow the inspection instructions for the type of brake on your bike. If your brakes do not pass inspection, refer to the *Brake Systems* section of Chapter 3, or take your bicycle to your Trek dealer for service.

**WARNING**

*If your brakes are not working properly, you can lose control and fall. Inspect the brakes thoroughly before every ride, and do not ride the bicycle until any problem has been corrected.*

**Hand-rim brakes**

Squeeze each brake lever toward the handlebar to make sure the brake moves freely and stops the bike. If the brake lever can be pulled to the handlebar, the brake is too loose. When the brakes are not applied, the brake pads should be 1 to 2mm from the rim. If the brake pads are too close to the rim, the brake is too tight. Brake pads should be aligned with the rim surface (Figure 1.4).

**Disc brakes**

Squeeze each brake lever toward the handlebar to make sure the brake moves freely and stops the bike. If the brake lever
can be pulled to the handlebar; the brake is too loose. The brake pads should be 0.25 to 0.75 mm away from the disc when the brakes are not applied. If the pads are too close, the brake is too tight, or mis-aligned.

Hard braking causes the disc, and the brake caliper, to get hot. After braking, do not touch the disc for at least 30 minutes. As with other rotating parts on a bicycle, avoid placing your fingers in the disc.

### Internal drum or roller brakes

Internal drum or roller brakes are actuated by a brake lever which is connected to the hub by a cable. If it takes more than about 5/8 inch (15mm) of brake lever movement to stop the bike, the brake is too loose. If it takes less than 15mm of lever movement to stop the bike, the brakes are too tight. Hard braking causes the hub shell to get hot. After braking, do not touch the hub shell for at least 30 minutes.

### Coaster brakes

Instead of operating by hand, coaster brakes are actuated with the legs by pedalling the crankarms backwards. The chain transmits the motion of the crankarms to the rear hub, where the brakes operate internally. To check the brakes, pedal backwards to make sure the brake engages with less than 60 degrees rotation (1/6 revolution).

The chain actuates the brake, so make sure the chain cannot come off. When grasped in the middle of the chain run between the front and rear sprockets, there should be between 1/4 and 1/2 inches (6-12 mm) total vertical movement (Figure 1.5). If the chain tension is incorrect, refer to the Drivetrain section of Chapter 3, or take the bicycle to your Trek dealer for service.
Check the attachment of both wheels.

To be ridden safely, the wheels of your bicycle must be firmly attached to the frame and fork. Bicycle wheels are attached by either threaded axle nuts or a quick-release, a lever-actuated wheel retention mechanism (Figure 1.7) that allows the wheel to be installed and removed without tools. For wheels attached with axle nuts, see page 8.

Quick-release adjustment and closure

For proper and safe adjustment of a quick-release, read and follow these instructions carefully.

To adjust the tension of a quick-release

1. Move the quick-release lever to the OPEN position (Figure 1.6) and set the wheel so it firmly touches the inside of the fork ends.

2. With the lever about halfway between the OPEN position and the CLOSED position, tighten the quick-release adjusting nut (Figure 1.7) until finger-tight.

3. Place the lever in the palm of your hand and throw the lever as shown in Figure 1.8 to the CLOSED position (Figures 1.10-1.11). At the half-closed position of the lever, there should be some resistance.

• Do not tighten the quick-release wheel retention mechanism by turning the lever like a wing nut (Figure 1.9); it will not result in sufficient force to hold the wheel in place.

WARNING

A quick-release that is not properly adjusted and closed may allow the wheel to be loose or come off unexpectedly, causing you to lose control and fall. Make sure the quick-release is adjusted and closed properly before riding the bike.
5. If the lever is moved to the **CLOSED** position with little or no resistance, clamping strength is insufficient. Return the lever to the **OPEN** position, tighten the quick-release adjusting nut further and close the lever, and again test for resistance. For further information on correct adjustment of the quick-release tension, read Figure 1.12.

6. Orient the quick-release levers so they do not interfere with any other bicycle part or accessory part (such as rack or fenders), and so obstacles in the path of the bicycle cannot snag the levers (Figures 1.10-1.11).

7. Test that you have properly adjusted and closed the quick-release. If the quick-release fails any test, either repeat these adjustment procedures, including these tests, or take your bicycle to your Trek dealer for service.

**Test for proper quick-release adjustment**
- Pick up the bike, and sharply hit the top of the tire (Figure 1.13). The wheel must not come off, be loose, or move from side to side.
- Make sure the quick-release lever cannot be rotated parallel to the wheel (Figure 1.14).
- When the quick-release is properly tightened, and clamped by the lever in the closed position, the clamping force is adequate to cause metal-into-metal engagement (embossing) of the dropout surfaces.
- See Figure 1.12.

If it requires more than 45 pounds (200 Newton) force to completely close the quick-release lever, open the lever and slightly loosen the quick-release adjusting nut.

If it requires less than 12 pounds (53.4 Newton) force to begin to open the lever from the fully closed position, open the lever and slightly tighten the quick-release adjusting nut.

Repeat the adjustment if necessary.
Threaded axle-nut wheel retention

If your bicycle is equipped with threaded axle-nuts instead of quick-release mechanisms, make sure the axle nuts are tightened correctly:

- Front wheel: 180-240 lb•in (20.3-27.1 Nm)
- Rear wheel: 240-300 lb•in (27.1-33.9 Nm)

For each wheel, test to ensure that you have properly tightened the axle-nuts. If the axle-nuts fail the test, either repeat these procedures, including these tests, or take your bicycle to your Trek dealer for service.

Test for proper axle-nut adjustment

- Pick up the bike, and sharply hit the top of the tire (Figure 1.13). The wheel must not come off, be loose, or move from side to side.

Redundant retention washers

For the front wheel of children's bikes and BMX bikes with axle nuts, a special toothed washer must be in place on both sides of the hub for correct wheel retention. The toothed washer is placed on the outside of the fork tip with the tooth in the corresponding hole in the fork tip (Figure 1.15).

Pegs on BMX bikes

Some bikes have tubular axle extensions, called pegs (Figure 1.16). For bikes with pegs on the front wheel, the toothed washer must be against the fork tip as in Figure 1.15, with the peg installed over the toothed washer. Additional washers and nut go inside the peg. Tighten axle-nuts in pegs:

- Using a 15 mm socket: 220-240 lb•in (24.9-27 Nm)
- Using a 19 mm socket: 350 lb•in (40 Nm)

⚠️ WARNING

A wheel axle-nut that is not properly tightened may allow the wheel to be loose or come off unexpectedly, causing you to lose control and fall. Make sure the axle-nuts are tightened properly before riding the bike.
☑ Check your handlebars and stem for signs of stress or fatigue.

Carefully inspect your handlebars and stem for signs of fatigue: scratches, cracks, dents, deformation, or discoloration. If any part shows signs of damage or fatigue, replace the part before riding the bicycle. Also check that the handlebar plugs are properly inserted into both ends of the handlebars, and bar-ends.

☑ Check your suspension adjustment

Make sure your suspension components are adjusted to your riding style, and that no suspension component can "bottom-out", or be so compressed that there is no further suspension travel or movement remaining. Suspension action influences how your bike handles and steers, so its proper adjustment is very important. If the suspension can be compressed so that the fork can no longer move, its movement will stop abruptly and could cause you to lose control. For more information on proper suspension adjustment, refer to Suspension Systems in Chapter 3, and also the Suspension Owner's Manual which may have come with your bicycle.
DURING EVERY RIDE: RIDE SAFELY

Wear a helmet.

An unprotected head is highly susceptible to injury, even from the slightest contact, but wearing a helmet that meets CPSC or CE safety testing standards (Figure 1.17) may help prevent injury. Eye protection and appropriate cycling clothes are also recommended.

Helmets should be removed when not riding the bicycle. If the helmet is caught or stuck on or between objects, the wearer could choke.

Know and observe local bicycle riding laws.

Most state and local areas have specific laws for cyclists, and you should follow them. Local cycling clubs or your state’s Department of Transportation (or equivalent) should be able to supply this information to you. A few of the more important rules of riding include the following:

• Use proper hand signals.
• Ride single file when riding with other cyclists.
• Ride on the correct side of the road; never go against traffic.
• Ride defensively; expect the unexpected. A cyclist is hard to see, and many drivers simply are not trained to recognize the rights and special considerations of a bicycle rider.

Do not use unsafe riding practices.

Many cycling accidents could be avoided by using common sense. Here are a few examples:

• **Do not ride ‘no hands’**; the slightest road imperfection could initiate a wheel shimmy, or cause the front wheel to turn unexpectedly.

• **Do not ride with loose objects attached to the handlebars, or any other part of the bicycle.** They could get caught in the wheel spokes, cause the handlebars to turn unexpectedly, or in other ways cause loss of control.

• **Do not ride while intoxicated, or while using medications which might make you drowsy.** Bicycles require good coordination to ride in control, and riders must be alert for hazards.

• **Do not ‘ride double’**. Standard bicycles are not designed to carry the additional load of a second rider. Also, extra weight makes a bicycle much harder to balance, steer and stop.
Ride defensively.

To motorists, pedestrians, or other bicyclists, you are not as visible as a car. Always watch for hazardous situations, and be ready to stop or take evasive action at all times.

Watch the road.

Watch for, and avoid, potholes, drain grates, soft or low shoulders, and other deviations which could cause your wheels to slip or create an impact. When crossing railroad tracks or drain grates, do so carefully at a 90° angle (Figure 1.18). If you are not sure of riding surface conditions, walk your bike.

Watch the cars you are preparing to pass.

If a car suddenly enters your lane, or someone unexpectedly opens the door of a parked car, you could be involved in a serious accident. Mount a horn or bell on your bicycle, and use it to alert others of your presence.

Be careful when riding in low light conditions.

Your bicycle is equipped with a full set of reflectors; keep them clean and in position. As useful as these reflectors are, they do not help you see, nor do they help you be seen unless light is directed on them. Use a working headlight and tail light when you ride in poorly lighted or low visibility conditions.

Also wear light, bright, and reflective clothing, especially at night, to make yourself more visible. The important thing is to see and be seen. If you do any amount of riding at dusk, at night, or in any poorly lighted conditions, consult your Trek dealer to find appropriate products to aid your vision and make you more visible.

WARNING

A bicycle rider without proper lighting and safety precautions may not have good vision, and may not be visible to others, which can cause a collision resulting in severe injury. Use front and rear bicycle lights and additional safety procedures when riding in poor visibility conditions. Failure to do so will increase your chances of being involved in an accident in low light conditions.
Avoid introducing water to any bearings of your bicycle.

The metal bearings in your bicycle allow the parts to rotate smoothly. Water in contact with metal causes corrosion, which will make the bearings lose their smoothness. If any bearings on your bicycle get submerged in water, take your bicycle to your Trek dealer for service.

Avoid high-pressure washing systems, like those at most car washes. The high pressure may force water into the bearings.

Use your brakes carefully.

Always keep a safe stopping distance between you and other vehicles or objects. Adjust stopping distances and braking forces to suit riding conditions.

If your bike has two hand brakes, apply both brakes at the same time. Over-use, or mis-use, of a front-wheel brake, such as using only the front-wheel brake in an emergency, could cause the rear wheel to lift from the ground which could cause you to lose control (Figure 1.19).

Many models of modern brakes are very powerful; they are designed to stop a bike in wet or muddy conditions. If you feel your brakes are too powerful for your riding needs, take your bike to your dealer for adjustment, or replacement of the braking system.

Be careful when riding in wet conditions.

No brakes, whatever their design, work as effectively in wet weather as they do in dry. Even properly aligned, lubricated, and maintained brakes require greater lever pressure, and longer stopping distances, in wet weather; anticipate the extra distance it will take to stop.

Wet weather causes reduced visibility, for both you and motorist, and reduced traction. Use slower cornering when traction is reduced, like when riding over wet leaves, painted crosswalks, or manhole covers.
Use special care when off-road riding.

- Ride only on the trails.
- Avoid rocks, branches, or depressions.
- Never ride a road or touring bike on unpaved roads, trails, or off-road.
- Wear protective clothing including helmet, eye protection, and gloves.
- When approaching a descent, reduce your speed, keep your weight back and low, and use the rear brake more than the front.

Avoid undue stress to your bicycle.

Bicycles are not indestructible: as with anything mechanical, every part of a bicycle has a limited useful life due to wear, stress, and fatigue. Fatigue refers to a low-stress force that, when repeated over a large number of cycles, can cause a material to fail or break. The length of the life of a part varies according to its design, materials, use, and maintenance. Although lighter frames or parts may, in some cases, have a longer life than heavier ones, it should be expected that lightweight, high performance bicycles and parts require better care and more frequent inspections.

Regularly inspect your entire bicycle for signs of fatigue stress:
- Dents
- Cracks
- Scratches
- Deformation
- Discoloration

Fatigue can be accelerated by large forces from unsafe riding practices:
- Jumping your bicycle
- Performing bicycle stunts
- Severe off-road riding
- Downhill riding
- Any abnormal bike riding

Carefully inspect your frame and components for signs of fatigue before and after each ride.

Even if you perform regular inspections, if you exceed the limit of strength of your bicycle or a given part, it will fail.
Before, During, or After Every Ride: Take Care of Your Bike

Keep your bicycle clean.
To work properly, your bicycle must be clean. If your frame or a component is dirty, clean it with a soft, damp cloth and Wrench Force® bike cleaner or a similar product.

Avoid leaving your bicycle out in the weather.
When not riding, store your bike where it will be protected from rain, snow, sun, etc. Rain or snow may cause the metal on your bicycle to corrode. Ultraviolet radiation from the sun may fade the paint, or crack any rubber or plastic on the bicycle.

Use proper storage for your bicycle.
Before storing your bike for an extended period of time, clean and lubricate it, and polish the frame with Wrench Force® frame polish or a similar frame protectant. Hang the bicycle off the ground with the tires at approximately half pressure. Do not store the bike near electric motors, as ozone from motors destroys rubber and paint. Before riding the bicycle again, be certain it is in good working order.

Protect your bicycle from theft.
Your new bicycle may be very attractive to thieves. Protect yourself from theft:
• Register the bicycle with your local police department.
• Make sure you return your warranty card; we will keep the serial number of your bike on file. Also, keep a record of the serial number in a safe place. See page ii for the location of the serial number on your bike.
• Purchase and use a lock. A good lock is effective against bolt cutters and saws. Follow the recommended locking procedures. Use your lock; never leave your bike unlocked while unattended, not even for a minute.
• With quick-release wheels, lock both of your wheels as well as your frame. If you have a quick-release seatpost binder, when locking your bike you may want to remove your seat and seatpost to prevent theft. However, avoid allowing water to enter your bicycle frame through the open seat tube of your bike.

Protect your bike from accidental damage.
Park your bike in a place where it will be out of the way, and make sure it cannot fall over. Do not lay the bike on its derailleurs, as you may bend the rear derailleur or get dirt on the
drivetrain. Don’t let the bike fall down, as this may cut the handlebar grips, or tear the seat. Incorrect use of bike racks may bend your wheels, as can riding over some obstacles.

These are just a few of the potential hazards you and your bike may encounter. If you suspect your bicycle has been damaged in any way, or tampered with, ensure there is no problem, or take it to your Trek dealer for inspection and repair.

**Use good shifting techniques.**

Some Trek bicycles are equipped with a derailleur system, where shifting is done by derailing, or moving the chain from one sprocket to another. Other Trek bikes may be equipped with internal gearing where shifting is done inside the rear hub. Read the information for your type of bicycle in the following sections:

- **Shifting a bike with a derailleur**

  The left-hand shifter controls the front derailleur and the right-hand shifter controls the rear derailleur. Use only one shifter at a time. Choose the gear combination most comfortable for riding conditions, one that allows you to maintain a constant rate of pedaling. It is not essential that various gear combinations be used in sequence.

  When shifting, plan ahead. Shift gears only when the pedals and chain are moving forward. Never attempt to shift gears when stopped or back-pedaling. When you shift, reduce the force on the pedals; excessive chain tension makes shifting difficult. This provides quicker, smoother shifting, will help avoid excessive chain and gear wear, and also will help avoid bent chains, derailleurs, and chainrings. Avoid shifting when going over bumpy surfaces, or railroad tracks; the chain may not shift properly, or may fall off.

  With modern indexed shifting systems, a movement of the shifter from one position to the next (or movement of the shifter to the "shift" position) should promptly move the chain from one gear to the next. However, bikes equipped STI road shifters and triple chainrings may shift better, particularly when shifting from the smallest chainring to the middle, if you “hold” the lever for a moment before letting go of the shifter.

- **Shifting a bike with internal gearing**

  When shifting gears, plan ahead. Shifting gears is best performed when coasting, stopped, or back pedaling. If you must shift while pedaling, reduce your pressure on the pedals. Excessive chain tension makes shifting difficult.

  Choose the gear most comfortable for riding conditions. You should be able to maintain a constant rate of pedaling.
Prevent handlebar impact damage to your frame.

With some bicycles, as the front wheel turns to extreme angles, the handlebar may contact the frame. Prevent damage from handlebar impact by padding the handlebar parts, the frame, or both, at the points of contact. See your Trek dealer for recommended protection devices or materials.

Never modify your fork, frame, or components.

Modifying the parts of your bike in any way, including the frame, fork, and all the components, may make your bike unsafe. As an example, some bike frames have special surface treatments which add strength; these could be removed through poor paint stripping techniques. Removing the redundant wheel retention tabs on fork tips or peg-and-eyelet style redundant retention devices is another example of how modifying a bicycle could make it less functional.

Changing the forks on your bicycle could alter the steering of the bicycle, or add additional, unwanted stress:

- Never add a suspension fork to a road bike
- Some Trek models are not compatible with dual-crown, triple-clamp forks.

If you must replace the fork on any bike, check with your dealer or Trek Bicycles’ technical service department to ensure the new forks are compatible with the frame.

Any modification of your frame, fork, or components means that your bike no longer meets our specifications and will therefore void the bike’s warranty.

WARNING

Never modify your frameset or parts in any way, including sanding, drilling, filing, removing redundant retention devices, installing incompatible forks, or by any other method. An improperly modified frame, fork, or component can cause you to lose control and fall.

Take care of your frameset.

Trek bicycles use a variety of materials in the construction of framesets (frame and fork). Your frameset may require special attention in its care and maintenance. See pages 85-87 for information about your frameset.
Use pedal systems keep your feet from slipping off the pedals.

The pedals are where your feet are placed on a bicycle; control and safety demand that your feet be secure on the pedals. For recreational riding on smooth surfaces, this requires only a pair of soft-soled shoes. As you ride harder, or the riding surface gets rough, pedal systems can help to keep the rider's feet on the pedals.

There are several types of pedal systems on Trek bikes.

Read the general information in Pedal system use- all systems as well as the specific information for your type of pedals:

• Toe-clips and straps (Figure 1.20) attach your feet to the pedals with a strap with a metal locator

• Clipless pedals, like a ski binding, mechanically engage a cleat attached to the sole of a special cycling shoe.

If you are uncertain about the operation of the pedal system on your bike, consult your Trek dealer. If your bicycle has a pedal system that does not fit, or you do not want it, have your Trek dealer change your pedals to your desired system.

If your bike came without pedals, you should choose the pedals that are best for you. Follow the manufacturer's instructions for installation and use of your pedals.

WARNING

While riding, your shoes must remain on the pedals or you may lose control of the bike and fall. When bringing the bike to a stop, your shoes must easily disengage from the pedals or you may fall off the bike. Always remove one foot from the toe-clip or pedal before bringing the bike to a complete stop.

Pedal system use- all systems

Before your first ride, familiarize yourself with your pedal system, and practice entry and exit in a stationary position. When the motions for entry and exit become natural, then practice in a flat, empty parking lot. While riding, watch the road; looking at your pedals will make it difficult to see upcoming obstacles.

Using toe-clips and straps

Properly fitted toe-clips place the ball of your foot over the pedal axle for improved pedaling power; make sure your toe-clips fit you correctly.
Use proper shoes with toe-clips.

Do not allow your feet to become entrapped in the toe-clips or straps. Use shoes which allow your foot to easily pass by the toe strap; do not use shoes with wide, heavily patterned soles. Always adjust the toe strap length with the buckle (Figure 1.20) to allow quick removal of your feet from the pedals.

To enter toe-clips

1. Straddle the bike.
2. With your left foot on the ground, move the right crank arm to its two o’clock position.
3. Place the toe of your shoe on the back edge of the upside-down pedal, with your toes pointed slightly downward (Figure 1.21).
4. With a motion similar to scraping something off the bottom of your shoe, flip the pedal into an upright position, and insert your foot into the toe-clip.
5. Push off with the left foot, and sit on the bicycle seat. Pedal one or two strokes to get moving, and use the same technique to flip the pedal and put your other foot into the second toe-clip.

To exit toe-clips

1. Raise the heel so the sole of your shoe clears the top of the pedal (Figure 1.22).
2. Withdraw your foot in an up-and-back motion, and make sure your foot clears the pedal.
3. As you bring the bike to a stop, place your weighted foot on the ground.

Using clipless pedals

Clipless pedals use a spring-loaded mechanism to engage a cleat, a small plate attached to the bottom of a special cycling shoe. If you did not receive clipless pedal information for your bike, get a copy from your dealer, or contact us and we’ll send them to you. The following information is only meant to supplement the pedal manufacturer’s instructions.

Use proper shoes and cleats with clipless pedals.

Do not ride clipless pedals in ‘street’ shoes on clipped-in platforms, or without engaging the cleats; the attachment of your feet to the pedals will be insecure. Always remove at least
one shoe from the pedals before bringing the bicycle to a complete stop. Use only the cleats supplied by, or approved by, the pedal manufacturer. Cleats from other pedal systems may not release properly.

**Install and adjust cleats and pedals correctly.**

Incorrect installation of the cleats could cause physical injury, so cleat installation should be done by your Trek dealer. On most pedals, the force required for entry and exit is adjustable. Incorrect adjustment of the clipless pedal release force could prevent your foot from disengagement from the pedal. For adjustment information, read the pedal manufacturer’s instructions supplied with your pedals.

**Keep your cleats and pedals in good condition**

Before attempting to engage your cleated shoe into the pedal, always clean both the cleats and the pedals. Debris or contamination in the pedals, or on the cleats, may interfere with entry or exit of clipless pedals. If the cleat is worn, the cleat may not properly function with the clipless pedal.

**To enter clipless pedals**

1. Engage the front of the cleat into the front of the pedal (Figure 1.23) and press down with the ball of your foot. An audible click signifies completed entry into the pedal.
2. Check the attachment by attempting a rolling motion on the pedal (Figure 1.24). If you can roll your shoe off the pedal, start the procedure again.
3. To mount the bike, push down on this pedal while pushing off with the other foot, and at the same time, sit on the bicycle seat.
4. Once moving, put your other foot into the second pedal using the same technique.

**To exit clipless pedals**

1. Twist your heel laterally away from the center-line of the bike (Figure 1.25).
2. As you bring the bike to a stop, place your foot on the ground.
Your supervision of your children as they learn about bikes, safety, and cycling rules of the road is critical to your children’s education (Figure 1.26). Explain the material in this section, Chapter 1, to your child before he or she enters the world of cycling. And instill in your children this cardinal rule for all young cyclists:

**Children should wear a helmet whenever they ride a bicycle or tricycle.**

**Training Wheels**

Some models of Trek bicycles come equipped with training wheels (Figure 1.27). As your child learns to ride a bicycle with training wheels, make sure the child has the skills necessary to stop the bike. Until this skill is mastered, the child must never ride the bike without supervision.

The training wheels may be adjusted to promote the learning of skills such as balancing and turning:

**To adjust the training wheels**

1. Check that the tires of the bicycle are correctly inflated.

2. Place the bike on a flat, smooth surface.

3. Loosen the rear axle nuts. Follow the procedures in the *Drivetrain* section of Chapter 3.

4. Stand the bike up very straight, and set a gap of about 1/4 inch (6mm) between the training wheels and the ground on both sides of the bike. Make sure the gap is the same on both sides.

5. Re-tighten the axle nuts as shown in the *Drivetrain* section of Chapter 3, including adjusting the chain tension.

6. Inspect the wheel attachment as shown in the *Wheels* section of Chapter 3.

**Re-adjust as the child’s skill level grows**

As the child’s skill level grows, you may gradually increase the clearance between the training wheels and the ground until the child no longer requires the training wheels.
## PERIODIC MAINTENANCE SCHEDULE

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This maintenance schedule is based on normal usage. If you ride your bike more than average, or in rain, snow, or off-road conditions, service your bicycle more often than the schedule suggests. If any part appears to be malfunctioning, inspect and service it immediately, or consult your Trek dealer.

**Recommended tools for proper bicycle maintenance:**
- Torque wrench with lb•in or Nm gradations
- 2, 4, 5, 6, 8 mm allen wrenches
- 9, 10, 15 mm open-end wrenches
- 15 mm box end wrench
- Socket wrench, 14, 15, and 19 mm socket
- T25 Torx wrench
- No. 1 phillips head screwdriver
- Bicycle tube patch kit
- Bicycle tire pump with gauge
- Tire levers
- Wrench Force® synthetic chain lube or similar lubricant
- Wrench Force® synthetic grease or similar bicycle grease
- Wrench Force® frame polish or similar frame protectant
- Special high pressure air pump for rear shock or suspension fork

*Note: Not all Trek bikes require all these tools*
A word about torque specifications

Torque is a measurement of the tightness of a threaded fastener such as a screw or bolt, determined by using a torque wrench. The torque specifications in this manual are listed to help you determine the correct tightness of parts and their threaded fasteners.

The torque specifications should be used to make sure you do not over-tighten the fasteners. Slight differences in a similar part may require a different torque, so in most cases we offer a range of torque. Applying more than the recommended torque to a fastener does not provide extra holding power, and may actually lead to damage or failure of a part.

Always perform the simple function tests listed in this chapter to make sure a part is properly tightened, whether or not the part was tightened with a torque wrench.
The handlebars, the part you hold with your hands when riding a bicycle, is primarily responsible for your ability to steer and control the bike. In addition, handlebars work with the seat to define your posture on the bike, adding comfort and efficiency to your cycling. The handlebars are connected to the bike by the stem (Figures 3.1.1-3.1.4). This section explains how to inspect, adjust, and lubricate your handlebars, stem, and bar-ends.

There are two types of stems:

- **Quill stems** have a tube, or quill (Figure 3.1.3), fastened inside the fork by an expanding wedge.
- **Direct-connect stems** (Figure 3.1.2) clamp to the outside of the fork steerer.

Some bikes also have extensions attached to the handlebars, called bar-ends (Figure 3.6).

### Inspection

If you are unsure of the safety of your handlebar system, do not ride the bicycle; take the bicycle to your dealer for adjustments.

**Once a month** make sure the stem is in alignment with the front wheel. Test the stem connection to the fork by attempting to turn the handlebars from side to side with the front wheel locked between your knees (Figure 3.1.5). Test the security of the handlebars by attempting to rotate them in the stem. Make sure that no cables are stretched or pinched by rotating the handlebars.

Check that all bolts are tight. The correct tightness varies according to the type of stem on your bike. If you are unsure of which type of stem your bike is equipped with, consult your Trek dealer. The bolts to tighten are:

- Stem expander (Figures 3.1.1 and 3.1.3): 175-260 lb•in (19.8-29.4 Nm).
- Handlebar clamp (Figures 3.1.1-3.1.2) on:
  - welded stems: 100-120 lb•in (11.3-13.6 Nm).

An improperly adjusted or tightened handlebar, stem, or bar-ends can cause you to lose control and fall. Make sure the stem, handlebar, and bar-ends are positioned and tightened properly before riding the bike.
- forged stems: 150-180 lb•in (17-20.3 Nm)
- 4-bolt BMX stems: 80-100 lb•in (9-11.3 Nm).

- Steerer clamp on direct-connect stems:
  - mountain bike or road (Figure 3.1.2): 100-120 lb•in (11.3-13.6 Nm).
  - BMX: 145 lb•in (16.4 Nm).
- Bar-end clamp (Figure 3.1.6): 85-125 lb•in (9.6-14.1 Nm)
- Stem angle adjustment (Figure 3.1.1 and 3.1.4): 150-170 lb•in (17-20.3 Nm)

**Bar-ends**

Never allow your bar-ends to come in contact with objects which may cause you to lose control of your bicycle. Bar-ends are designed for climbing only. Ensure the bar-ends face forward and away from you, at an angle not less than 15° from parallel to the ground.

**Adjustment**

Handlebar position, the angle, width, and height of the handlebars, is largely a matter of personal preference blending comfort, efficiency, and balance. Your hands should be comfortable, and able to easily operate all controls. If your hands, arms, or shoulders are uncomfortable or numb you may need to adjust the handlebars or select components more suitable to your personal needs; consult your Trek dealer.

Some handlebars may have their width adjusted by cutting, indicated by cut marks on the bars. Do not cut handlebars that do not have cut marks, including Bontrager Race XXXLite carbon fiber handlebars. When cutting bars, do not cut them shorter than the marks, or you may remove internal reinforcements. If you are unsure, consult your Trek dealer.

**To adjust the angle of the handlebars**

1. Loosen the handlebar clamp bolt(s) on the stem just enough that the handlebars can be rotated in the stem.
2. Position the handlebars to the desired angle, making sure they are centered in the stem.
3. Tighten as shown in *Inspection.*
To change the angle of an adjustable-rise stem
There are two types of these stems: Figure 3.1.1 and Figure 3.1.4.
1. Loosen the angle adjusting bolt(s) until the stem can be rotated.
2. Position the stem to the desired angle.
3. Tighten the angle adjusting bolt as shown in Inspection.

To change the handlebar height with a quill stem
Adjusting the handlebar height on a direct-connect stem affects the headset bearing adjustment. This procedure requires special tools and training so this should only be done by your Trek dealer.

To adjust the height of the adjustable-rise stem in figure 3.1.1, first change the stem angle, which gives access to the stem expander bolt.
1. Loosen the stem expander bolt two to three turns.
2. Tap the top of the stem expander bolt with a wood or plastic-faced mallet to loosen the stem wedge.
3. Adjust the handlebars to the desired height, but with the minimum insertion line inside the frame (Figure 3.1.7). A minimum of $2\frac{3}{4}$ inches (70 mm) of the stem quill must always remain in the frame.
4. Tighten as shown in Inspection.

WARNING
Never ride your bicycle with a quill stem raised above the minimum insertion mark. A quill stem that is positioned too high can damage the bike and can cause you to lose control and fall. Make sure the minimum insertion mark (Figure 3.1.7) is inside the frame.

Lubrication
Once a year lubricate the stem.
Note: Lubricating a direct-connect stem requires adjustment of the headset bearings, so should only be done by your Trek dealer.

To lubricate a quill stem
1. Follow the instructions To change the handlebar height with a quill stem, and remove the stem from the frame.
2. Wipe any old grease off the stem, and clean it.
3. Apply a thin layer of Wrench Force® synthetic grease or a similar lubrication to the section of the quill that will be inserted into the frame, including the stem wedge.

4. Insert the stem into the frame, and follow the instructions To change the handlebar height with a quill stem.

Installation and use of Bar-Keeper accessories

The Bar-Keeper handlebar system is designed to accept the attachment of a variety of custom accessories. Although some attachments may be unique to the accessory, all generally attach following one of several methods. These instructions explain the attachments generally, while using specific examples.

If force is applied to the side of the handlebars while you are riding, the bicycle will turn. If this happens unexpectedly, it could cause you to lose control of the bike. Accessories that weigh more, like water bottles, should be placed as close as possible to the center of the handlebars to minimize any effect on the steering. Directional accessories, like lights, may need to be exactly centered. Avoid applying force to the handlebars when riding, like dialing a cell phone or attaching an item to its carrier. Instead, bring the bike to a stop and enjoy the break.

![Insertion point for Bar-Keeper accessory rail channel](image)

**WARNING**

Pushing on the handlebar accessories may cause the bike to turn unexpectedly, causing you to lose control and fall. Place accessories in the middle of the handlebar, or stop the bike to operate accessories.

When transporting your bicycle on a car rack or other vehicle, always remove any accessories from the handlebar. As an example, do not leave a cell phone, computer, or water bottle attached to the Bar-Keeper when carrying your bike on a car roof rack. The vibration from the vehicle, or the wind, could knock the accessories off the handlebars.
To install the Bar-Tab

This attachment is used to attach a water bottle mount to the Bar-Keeper accessory rail.

1. Insert the head of the Bar-Tab mounting bolt (Figure 3.1.9) into the left end of the Bar-Keeper channel (Figure 3.1.8).
2. Slide the mounting bolt to the desired location and tighten the thumbwheel.
3. Make sure the Bar-Tab does not move on the Bar-Keeper.
4. Use the two accessory screws to attach the water bottle cage, or other Bar-Tab accessories.

To install a Trek computer

1. Remove the rubber cover on the right side of the accessory rail.
2. Identify the computer mounting plate for your computer type: wired or wireless.
3. Thread the two small front mounting screws several turns into the underside of the mounting plate.
4. Slide the mount in place.
   Hook the two front screws into the slots built into the Bar-Keeper mount.
5. Engage the large central plastic tab.
6. After sliding the computer mount fully into place, install the two rear mounting screws.

To install a wrap clamp

Some accessories, like a bicycle computer from a company other than Trek, attach to the Bar-Keeper handlebar with a wrap-around type clamp.

1. Remove the clamp screw from the wrap clamp.
2. Gently spread the wrap clamp and slide over the handlebars with the screw hole facing forward.
3. Slide the wrap clamp to the desired location.
4. Apply a small amount of grease to the threads and bearing surfaces of the clamp screw.
5. Attach the desired accessory to the wrap clamp.
6. Make sure the wrap clamp does not move on the Bar-Keeper.
CHAPTER THREE

Inspection, Adjustment & Lubrication

The seat, the part you sit on when riding a bike, is held in place by the seatpost (Figure 3.2.1). The seatpost binder secures the seatpost in the frame. Proper adjustment of each component is important for your comfort and pedaling efficiency. This section explains how to inspect, adjust, and lubricate your seat, seatpost, and seatpost binder.

Inspection

Every month inspect the seatpost quick-release lever, or seat post binder bolt, and seat fixing bolt(s) (Figures 3.2.1 and 3.2.2) for proper tightness. Make sure the seat is secure by attempting to turn the seat and seatpost in the frame, and attempt to move the front of the seat up and down. If the seat rotates, is loose, or moves up and down, tighten the binder bolt or quick-release, or seat fixing bolts, and repeat the test. Never engage the seatpost binder with the seatpost out of the frame.

Tighten the following bolts:

- Seat post binder (Figure 3.2.1): 85-125 lb•in (9.6-14.1 Nm).
- Seat fixing bolts of these types:
  - using a 13 or 14 mm open-end wrench (Figure 3.2.2): 180-220 lb•in (20.3-24.9 Nm).
  - single, using a 6 mm allen wrench (Figure 33.8): 150-250 lb•in (17-28.3 Nm).
  - double, using a 5 mm allen wrench: 80-125 lb•in (9.6-14.1 Nm).
  - double, using a 4 mm allen wrench: 45-60 lb•in (5-6.8 Nm).
- Tricycle seat mast clamp bolts: 85-125 lb•in (9.6-14.1 Nm).

For a seatpost binder using a quick-release lever, the mechanism works the same as a wheel quick-release. Adjust the lever tension, and make sure it is in the closed position, by following the instructions Quick-release adjustment and closure on pages 65-66. Do not operate the quick-release while riding: on a Trek Liquid model, your fingers could be pinched by movement of the suspension parts.

Adjustment

The height of the seat is very important for comfort, safety, and efficiency. Seat angle (tilt) and fore-aft position affect comfort at both the seat and handlebar by changing the distribution of your weight between them.
The correct adjustment of the seat angle is largely a matter of personal preference; first try riding with the top of the seat parallel to the ground. For bikes with rear suspension, try tilting the seat nose down slightly so that compression of the rear shock under your body weight (sag) results in a flat seat.

The seat may also be moved forward or backward along the seatpost to increase comfort as well as adjust the distance to the handlebars.

With proper adjustment, the right bike seat will be reasonably comfortable even for long rides.

**WARNING**

Extended riding with a poorly adjusted saddle, or one that does not properly support your pelvic area, can cause short-term or long-term injury to your nerves and blood vessels. If your saddle causes pain or numbness, re-adjust the saddle position. If after adjustment your saddle still causes pain or numbness, consult your Trek dealer about further positioning or replacing the saddle with one that fits you better.

**To adjust the angle of the seat**

1. Loosen the seat fixing bolt just far enough so the seat can be tilted fore and aft.

   *Some seatposts use two bolts, where angle adjustment is done by loosening one bolt and tightening the other bolt.*

2. Place a straight edge, such as a bubble level or ruler, across the top of the seat to better see the angle.

3. Adjust the seat and re-tighten the seat fixing bolt as in *Inspection*.

**To adjust the seat height on a bicycle**

1. Sit on the seat in riding position without shoes, while someone holds the bicycle up.

2. Position the crank arms so they are parallel to the seat tube.

3. Loosen the seatpost binder bolt, or quick-release.
4. Extend the seatpost until, with your heel resting on the bottom pedal (Figure 3.2.3), your extended leg is straight. When wearing your shoes there should be a slight bend in your knee in a proper riding position; with the ball of your foot on the pedal.

5. Make sure the minimum insertion mark (Figure 3.2.4) on the seatpost is not visible above the bike frame. A minimum of 2 1/2 inches (64 mm) of seatpost must remain in the frame.

6. Re-tighten the seatpost quick-release, or bolt, as described in *Inspection*.

**WARNING**

A seatpost that is positioned too high can damage the bike and can cause you to lose control and fall. Make sure the minimum insertion mark (Figure 3.2.4) is inside the frame.

**To adjust the seat position on a tricycle**

1. Loosen and remove the seat mast clamp bolts (Figure 3.2.5).
2. Move the seat mast to the desired position.
3. Install and tighten the seat mast clamp bolts.

**Lubrication**

Lubricate the seatpost every year (except for OCLV bikes where no lubrication is recommended; see *Care of Your Frame or Fork* on pages 85-87).

**To lubricate the seat post**

1. Loosen the seatpost binder bolt, or open the quick-release, and remove the seatpost from the frame.
2. Wipe any old grease off the seatpost, and clean if necessary.
3. Apply a thin layer of Wrench Force synthetic grease or a similar lubricant to the section of the seatpost that will be inside the frame.
4. Insert the seatpost into the frame.
DRIVETRAIN:
PEDALS, CRANK, CHAIN, AND CASSETTE

The drivetrain (Figure 3.3.1) consists of the parts of the bicycle that transmit power to the rear wheel:
- Pedals (and toe-clip assemblies on some models)
- Crankset- left and right crank arms, chainring(s), and bottom bracket (the axle and bearings on which the crankset rotates).
- Chain
- Cassette, or freewheel.

This section explains how to inspect, adjust, and lubricate your drivetrain. For bikes equipped with a shift system inside the rear hub, also refer to the section Internal Shift Systems.

Inspection

When the drivetrain is working properly, shifting is easy, your bike is quiet, and its efficiency can reach its maximum.

**Once a month** check that the chain and cassette are clean, free of rust, and properly oiled. All links of the chain should pivot smoothly and without squeaking, and no links of the chain should be deformed. Take off the rear wheel, and rotate the cassette in your hands. If you hear a grinding noise or your cassette stops immediately after spinning it, the cassette may need adjustment or replacement; take your bicycle to your Trek dealer for service.

**Once a month on a bike with a chainguard,** check that the chainguard is firmly attached and correctly aligned. Push the chainguard side-to-side, and tap on it. Lift the rear wheel off the ground and rotate the crankarms, and listen for any sounds which might indicate the crank or chain is rubbing on the chainguard. Re-align the chainguard so that it does not move, rattle, or rub, and tighten the attachment hardware.

**Every 3 months** inspect your pedals and toe-clips. Make sure your toe-clips are securely tightened to the pedal, and the pedal reflectors are clean and securely in place. Tighten the pedals into the crank arms; turn the right pedal clockwise, but the left pedal counter-clockwise (Figure 3.3.2):
- Pedals: 350-380 lb-in (40.2-42.9 Nm).

To check that the pedal bearings are properly adjusted, rotate and move the pedals right to left and up and down.
with your hand. If you feel any looseness or roughness in the pedal bearings, have your pedal adjusted, re-greased, or replaced by your Trek dealer.

**Every 3 months** inspect the crankset, check the bottom bracket adjustment, and tighten the crank bolts:

- Crank bolts
  - single 6 or 8mm bolt on each arm: 350-435 lb•in (39.5-49.2 Nm)
  - double pinch bolts on each arm (Figure 3.3.3): 88-132 Lb•in (10-15 Nm)
- Chainring bolts: 70-95 lb•in (7.9-10.7 Nm)

**To check the bottom bracket bearing adjustment**

1. Lift the chain from the chainrings.
2. Rotate the crank so that one of the arms is parallel the seat tube.
3. Put one hand on the crank arm and one hand on the seat tube, and attempt to move the crank arm laterally toward and away from the seat tube.
4. Spin the cranks.

If the crank feels or sounds loose, or if the motion stops abruptly or you hear a grinding noise coming from the bearings, the bearings need to be adjusted or re-greased by your Trek dealer.

Clean the chainrings and inspect them for damage. If any teeth are bent or broken, have the chainring replaced by your Trek dealer. Note that on some chainrings, a few teeth have a special shape to enhance shifting.

**Every 3 months** check your chain for wear with a chain wear gauge or a ruler. Each full link of a new chain measures one inch. If 12 links of your chain measures 12\(\frac{1}{8}\) inches or more, it should be replaced. With good maintenance, a chain usually lasts 1000 to 1500 miles on a road bike, less on a mountain bike. Replacing the chain takes special tools and training and should only be done by your Trek dealer.

**Adjustment**

To adjust the release force of clipless pedal, or to adjust the cleats, read *Use Your Pedal System Safely* in Chapter One.

Some Trek bicycles offer adjustable crankarm length. To
change the crank length, remove the pedals and install them into the second set of holes (Figure 3.3.4).

Adjustment of any bearings in the drivetrain including the bottom bracket, cassette, or pedals, requires special tools and training. These services should only be performed by your Trek dealer.

To adjust the chain tension on a single speed bike
1. Gradually loosen the rear wheel axle nuts on alternate sides of the wheel.
2. Slide the wheel to re-tension the chain, and center the wheel in the frame.
   *Some models have a chain tensioning device which helps position the wheel.*
3. Follow the Inspection and Adjustment procedures in the Wheels section to re-install the wheel.
   *Adjusting training wheels is covered in Chapter One.*

Lubrication and cleaning

**Once a month** clean the cassette and oil the chain. Always place a rag behind the chain to avoid getting oil on the rest of the bicycle. Use Wrench Force® synthetic chain lube or similar lubrication. After oiling your chain, wipe off the excess oil with a rag. See your Trek dealer for a recommended oil.

To clean the cassette

*Do not use gasoline; it's too flammable and leaves a grease-contaminating film after evaporating.*
1. Remove the surface dirt around the cog teeth with Wrench Force® de-greaser or a similar solvent, and a brush.

**Once a year** re-grease the pedal bearings, the bottom bracket bearings, and re-grease the part of the pedal axles that thread into the crank arms. Some pedal bearings and bottom bracket bearings are permanently sealed and do not require yearly re-greasing. Re-greasing bearings requires special tools and training, so this should only be done by your Trek dealer.

To re-grease the pedal threads

*Note: There are right and left pedals, usually marked with a letter stamped on the end of the pedal axle, or on the wrench flats.*
1. Remove the pedals; turn the right pedal spindle counterclockwise, but turn the left clockwise.
2. Apply a light coat of Wrench Force® synthetic grease or a similar lubricant over all the threads. See your Trek dealer for a recommended grease.
3. Install the pedals on the proper side; put the right pedal on the right crank arm and the left pedal on the left crank arm.
4. Follow the instructions for tightening pedals in Inspection.
DERAILLEUR SHIFT SYSTEMS

Derailleur Shifting Systems

Some Trek bikes are equipped with a derailleur shifting system that changes gears by de-railing the chain, pulling it off one cog or sprocket onto another. The shift system consists of those parts of the bicycle which allows the derailleur to shift gears, including the front derailleur (Figure 3.4.1) or rear derailleur (Figure 3.4.2), the shifters (Figures 3.15-3.19), and the shift cables.

There are several different types of shifters on Trek bikes:
- Twist shifters, shifted by rotating a section of the handlebar grip (Figure 3.4.3)
- RapidFire or E-Z Fire shifters, with one thumb-activated shift lever and one finger-activated shift lever, both beneath the handlebar (Figure 3.4.4)
- Shimano STI Dual Control road shifters where both levers shift gears (Figure 3.4.5)
- Bar end shifters (Figure 3.4.6)
- Campagnolo Ergopower shifters (Figure 3.4.7)

Inspection

In these instructions, we refer to shifting terms:
- Up-shifting is changing to a gear that is harder to pedal: a larger chainring, or a smaller rear cog.
- Down-shifting is changing to a gear that is easier to pedal: a smaller chainring, or a larger rear cog.
If your derailleur system is properly adjusted, it is quiet. If an unusual noise follows any shift, your derailleur cable may need to be adjusted. If, after adjustment, the noise persists or grows louder, stop the bicycle and try to locate the noise. If necessary, ask your Trek dealer to identify and correct any problems.

**Once a month** check the shift cables for kinks, rust, broken strands, or frayed ends. Also check the housing for loose wire strands, bent ends, cuts, and wear. If you suspect a problem with your shift cables, do not ride your bicycle; follow the instructions *To replace a shift cable*, or have your Trek dealer service your bicycle.

**Once a month** check the operation of the left shift levers/front derailleur. When down-shifted, the front derailleur should shift the chain from a larger chainring to a smaller one. When up-shifted, the derailleur should shift the chain from a smaller chainring to a larger one. After the shift, by moving the shifter slightly, you should be able to position the front derailleur such that it does not rub on the chain. The chain should not fall off the inner-most or outer-most chainrings at any time.

**Once a month** check the operation of the right shift levers/rear derailleur. When down-shifted, the rear derailleur should shift the chain from a smaller cog to a larger one. When up-shifted, the rear derailleur should shift the chain from a larger cog to a smaller one. After the shift, the rear derailleur should be positioned such that the chain runs smoothly without jumping. The chain should not fall off the inner-most or outer-most cogs at any time.

### Adjustment

Derailleur adjustment should be done with the bike held firmly in a workstand, or with someone holding the rear wheel off the ground, such that the drivetrain and shift system can be operated while the bike remains stationary.

#### To adjust the low gear position of the front derailleur

1. Shift the chain onto the smallest front chainring and the largest cassette cog.
2. Loosen the front derailleur cable clamp bolt (Figure 3.4.1) until the cable is free.
3. Turn the low gear adjusting screw (marked “L”, Figure 3.4.8) until the inner chain guide of the derailleur is approximately 0.5 mm from the chain.
4. Pull on the cable end, and down-shift the left shift lever several times so it is in the small-chainring position.
5. Turn the shift cable adjusting barrel to its most clockwise position.

6. Insert the cable in the groove found next to the derailleur cable clamp bolt, pull the cable taut, and clamp the cable:
   • Front derailleur cable clamp bolt: 44-60 lb•in (5.0-6.8 Nm).

To adjust the high gear position of the front derailleur

1. Shift the rear derailleur to the smallest rear cog.

2. Turn the high-gear adjusting screw (marked “H”, Figure 3.4.9) counter-clockwise until it cannot interfere with the motion of the derailleur.

3. While hand-turning the cranks, use the shifter to carefully shift the chain onto the outside chainring.

4. With the shifter, position the outer chain guide of the front derailleur approximately 0.5 mm from the chain.

5. Re-tighten the high gear adjusting screw until it meets resistance. If you have turned the screw too far, the front derailleur will move toward the small chainring.

Check your adjustments; go through the various gear combinations. Make sure the chain does not fall off when you shift, and the derailleur cage does not rub on any part of the crankset.

To adjust the middle gear position of the front derailleur, with three chainrings

1. Shift the chain onto the largest front chainring and the smallest rear cog.

2. Rotate the cable tension barrel-adjuster (on the downtube, or on the lever) counter-clockwise increasing cable tension to align the inner derailleur cage until it just touches the chain.

Go through the various gear combinations to ensure the chain smoothly lines up with all the chainrings.

   Note: some front shifters have a ‘tab’ feature. By slightly downshifting the lever, the derailleur should move in slightly, and should no longer be touching the chain.
**To adjust the high gear position of the rear derailleur**

1. Shift the chain onto the smallest rear cog and the largest front chainring.
2. Loosen the cable clamp bolt (Figure 3.4.2) until the cable is free.
3. Stand behind the bicycle to see that the smallest rear cog, the chain, and the two derailleur pulleys are in line.
4. If they are not aligned, turn the high gear adjusting screw (usually marked “H”, Figure 3.4.10) until this line is established.
5. While pulling on the cable, up-shift until the shifter is in the small cog position.
6. Turn the adjusting barrel on the shifter, or down tube, all the way clockwise. Turn the adjusting barrel on the rear derailleur all the way clockwise, and then one turn counter-clockwise.
7. Insert the cable into the clamp bolt groove on the rear derailleur, pull the shift cable taut, and clamp the cable:
   - Rear derailleur cable clamp bolt: 44-60 lb•in (5.0-6.8 Nm).

**To adjust the low gear position of the rear derailleur**

1. Turn the low gear adjusting screw on the rear derailleur (usually marked “L”, Figure 3.4.11) far enough counter-clockwise so that it will not restrict the movement of the derailleur.
2. Carefully shift the chain onto the smallest front chainring and the largest rear cog. Do not over-shift the rear derailleur, or the chain may wedge between the large cog and the spokes.
3. Position the rear derailleur pulleys in line with the largest cog.
4. Turn the low gear adjusting screw clockwise until it meets resistance. If you have turned it too far, the derailleur will move toward the outside of the bicycle.
5. Go through the various gear combinations. Make sure the chain does not fall off when you shift.

**To align the indexing system of the rear derailleur**

1. Shift the chain onto the largest front chainring and the smallest rear cog.
2. Shift one click with the rear shifter.
3. Check if the chain moves smoothly to the next gear.
4. If the chain makes excessive noise or does not shift, turn the barrel-adjuster counter-clockwise in small increments and check again for a smooth shift.

If instead, the chain moves to the third smallest cog, turn the barrel adjuster clockwise until alignment with the derailleur pulleys and the second smallest cog is achieved. Go through the various gear combinations to ensure the chain smoothly lines up with all the rear cogs.

If the derailleur cannot be adjusted in this manner, the derailleur hanger may be out of alignment; take the bike to your Trek dealer for service.

To replace a shift cable
1. Shift the chain onto the smallest front chainring and the smallest rear cog.
2. Note the path the derailleur cable follows, loosen the derailleur cable clamp bolt holding the bad cable, and remove the cable through the shift lever.

Some shifters have a covered cable access: either a screw, or a cover held by a screw. If you can’t find the cable access for your shifter, check with your dealer.

3. Inspect the housings; if they are damaged or rusty, replace them.

Note: If you replace any housings, make sure the pieces are of the correct type of housing, and cut them to the proper length (use the old pieces as guides). Make sure the housing ends are free of burrs; the cable should pass freely through these ends.

4. Grease the new cable and feed it through the lever and all of the cable guides and housings, and the cable clamp bolt following the same path as the old cable.

5. Follow the directions for derailleur adjustment.

6. Cut the cable so no more than 2 inches (51 mm) of cable length extends beyond the cable clamp bolt.

7. Crimp on a metal end-cap to prevent fraying of the cable end, or apply some solder to the end of the cable.

Lubrication

**Every month**, lubricate all pivot points on both the front and rear derailleurs, including the derailleur pulleys on the rear derailleur, with Wrench Force® synthetic chain lube or similar lubrication.

**Whenever a cable is replaced**, lubricate the cable, where it passes through the housing, with a light grease.
INTERNAL SHIFT SYSTEMS

Introduction

Some Fisher bicycles are equipped with an internal shift system, where gear changes are made inside the rear hub. Determine which of the four types of internal shift systems is on your bike and read the information for that system covered on the following pages:

- **Shimano Nexus 8 speed** has 8 gear position indicated on the shifter
- **Shimano 3 speed** has 3 gear position indicated on the shifter
- **SRAM DualDrive 2 x 7 speed** mixes an internal shift system with a rear derailleur

Nexus 4 or 8 speed systems

The internal shift system consists of those parts of the bicycle which allow you to shift gears including the shifter, rear hub, and shift cable. The shifting mechanism is enclosed, keeping the shifting system lubricated for low maintenance. These instructions explain how to inspect, adjust, and lubricate an internal shift system.

Inspection

A properly adjusted shift system is quiet. If an unusual noise follows any shift, or while pedaling, your shift cable may need to be adjusted. If after adjustment the noise persists or grows louder, stop the bicycle and try to locate the noise. If necessary, ask your Trek dealer to identify and correct any problems. For more information about your shift system consult your Trek dealer.

**Once a month**, make sure the hub gears are properly adjusted:
- On a Nexus 7 speed, or Nexus 4 speed, system with the shifter in 4th gear, the red lines on the pulley and the cog joint bracket (Figure 3.5.1) should line up.

**Once a month**, check the shift cable for kinks, rust, broken strands, or frayed ends. Also check the housing for bent ends, cuts, broken coils and wear. If you suspect a problem with your...
shift cable, do not ride your bicycle. Replace the cable and/or housing before riding your bicycle by following these instructions, or take your bike to your Trek dealer for service.

Adjustment

To adjust the rear shifting
1. Rotate the shifter to the 4th gear position.
2. Align the indicator on the rear hub pulley with the cog joint bracket (Figure 3.5.1)
3. If the red lines do not line up, adjust the gear cable tension by rotating the barrel adjuster (Figure 3.5.2) until this alignment is achieved.
4. Shift to 1st gear, then back to 4th, and re-check the adjustment.

To replace the shift cable
1. Loosen the cable fixing bolt.
2. Remove the phillips head screw holding the cable-end cover.
3. Slide the cable-end cover (Figure 3.5.2) forward.
4. Note the path of the old cable, and remove the cable.
5. Install a new cable in the shifter, housing, and cable guides, following the old path.
6. Re-attach the cable fixing bolt.
7. Re-attach the cover on the shifter.
8. Crimp on a metal end-cap to prevent fraying of the cable end, or apply some solder to the end of the cable.
9. Follow the instructions To adjust the rear shifting.

Lubrication

Once a year, lubricate the Nexus hub bearings. This procedure takes special tools and training, so should be done by your Trek dealer.
Whenever a cable is replaced, lubricate the cable with Wrench Force® synthetic chain lube or a similar lubricant.
CHAPTER THREE
Inspection, Adjustment & Lubrication

3 speed shift system

The internal shift system consists of those parts of the bicycle which allow you to shift gears including the shifter, rear hub, and shift cable. The shifting mechanism is enclosed, keeping the shifting system lubricated for low maintenance. These instructions explain how to inspect, adjust, and lubricate an internal shift system.

Inspection

A properly adjusted shift system is quiet. If an unusual noise follows any shift, or while pedaling, your shift cable may need to be adjusted. If after adjustment the noise persists or grows louder, stop the bicycle and try to locate the noise. If necessary, ask your Trek dealer to identify and correct any problems. For more information about your shift system consult your Trek dealer.

Once a month, make sure the hub gears are properly adjusted:
• On a Nexus 3 speed system, with the shifter in 2nd gear, the indicator in the bell crank window (Figure 3.5.4) should line up with the mark on the push rod (Figure 3.3.5).

Once a month, check the shift cable for kinks, rust, broken strands, or frayed ends. Also check the housing for bent ends, cuts, broken coils and wear. If you suspect a problem with your shift cable, do not ride your bicycle. Replace the cable and/or housing before riding your bicycle by following these instructions, or take your bike to your Trek dealer for service.

Adjustment

To adjust the rear shifting
1. Rotate the shifter to the 2nd gear position.
2. Align the indicator on the bell crank window with the line on the push rod.
3. If the lines do not line up, adjust the gear cable tension by rotating the barrel adjuster (Figure 3.5.6) until this alignment is achieved.
4. Shift to 1st gear, then back to 2nd, and re-check the adjustment.

**To replace the shift cable**
1. Remove the bell crank cover set screw (Figure 3.5.4).
2. Remove the bell crank cover.
3. Loosen the cable fixing bolt (Figure 3.5.6).
4. Note the path of the old cable, and remove the cable.
5. Install a new cable in the shifter, housing, and cable guides, following the old path.
6. Re-attach the cable fixing bolt.
7. Crimp on a metal end-cap to prevent fraying of the cable end, or apply some solder to the end of the cable.
8. Follow the instructions *To adjust the rear shifting.*

**Lubrication**

- **Once a year,** lubricate the Nexus hub bearings. This procedure takes special tools and training, so should be done by your Trek dealer.
- **Whenever a cable is replaced,** lubricate the cable with Wrench Force® synthetic chain lube or a similar lubricant.
The DualDrive shift system combines an internal shift hub with an external derailleur shifting system, consisting of those parts of the bicycle which allow you to shift gears including the shifter, rear hub, cassette, rear derailleur, and shift cables. The derailleur portion of the DualDrive system is a regular rear derailleur, explained on pages 35-39. These instructions explain how to inspect, adjust, and lubricate the internal-shifting rear hub portion of the DualDrive shift system with its two-position thumb shifter (Figure 3.5.7).

**Inspection**

A properly adjusted shift system is quiet. If an unusual noise follows any shift, or while pedaling, your shift cable may need to be adjusted. If after adjustment the noise persists or grows louder, stop the bicycle and try to locate the noise. If necessary, ask your Trek dealer to identify and correct any problems. For more information about your shift system consult your Trek dealer.

**Once a month**, make sure the hub gears are properly adjusted. Push the shifter from Uphill mode to Standard mode, then back again. If the hub does not shift smoothly in both directions, either follow the instructions to adjust the shifting or take your bicycle to your Trek dealer for service.

**Once a month**, check the shift cable for kinks, rust, broken strands, or frayed ends. Also check the housing for bent ends, cuts, broken coils and wear. If you suspect a problem with your shift cable, do not ride your bicycle. Replace the cable and/or housing before riding your bicycle by following these instructions, or take your bike to your Trek dealer for service.

**Adjustment**

**To adjust the rear hub shifting**

1. Place the shifter in the Standard mode.
2. Align the indicator on the Clickbox window (Figure 3.5.8) by rotating the barrel adjuster.
3. Shift to Uphill mode, then back to Standard mode, and re-check the adjustment.
To remove the rear wheel
1. With the derailleur, shift the chain to the smallest rear cog.
2. Shift the rear hub to Uphill mode.
3. Push the Clickbox button (Figure 3.5.8) down.
4. Pull the Clickbox off the rear axle.
5. Screw out the shifting rod (Figure 3.5.9).
6. Follow the instructions To remove a wheel on page 69.

To install the rear wheel
1. Follow the instructions To install a wheel on page 69.
2. Screw in the shifting rod.
3. Place the Clickbox on the rear axle.
4. Push the Clickbox button.
5. Follow the instructions To adjust the rear hub shifting on the previous page.

To replace the shift cable
1. Snap off the Clickbox cover (Figure 3.5.10).
2. Loosen the cable clamp bolt.
3. Note the path of the old cable, and remove the cable. There is a snap-in plastic cover over the cable head in the shifter.
4. Install a new cable in the shifter, housing, and cable guides, following the old path.
5. Pull the cable snug and re-attach the cable clamp bolt.
6. Follow the instructions To adjust the rear hub shifting on the previous page.
7. Crimp on a metal end-cap to prevent fraying of the cable end, or apply some solder to the end of the cable.

Lubrication
The DualDrive hub bearings are designed to be permanently lubricated under normal use. Whenever a cable is replaced, lubricate the cable with Wrench Force® synthetic chain lube or a similar lubricant.
The headset (Figure 3.6.1) is the bearing system that allows rotation of the fork, stem, and handlebars, allowing you to steer the bike. These instructions explain inspection, lubrication, and adjustment of the headset and fork.

If your bicycle is equipped with a suspension fork, also refer to Suspension Systems on page 79. If your bicycle is equipped with an aluminum or carbon fiber fork, also refer to Take Care of Your Frame and Fork on pages 85-87.

**Inspection**

**Once a month** inspect the headset of your bicycle to see that it is not loose, nor too tight. If your headset bearings are loose or too tight, do not ride the bicycle; take your bike to your Trek dealer for service.

**To check if the headset is loose**

1. Stand over the top tube of your bicycle with both feet on the ground.
2. Apply the front brake firmly while you rock the bicycle forward and backward.
   
   *If your bike is not equipped with a front brake, do this inspection by turning the front wheel to be across, or perpendicular, to the pushing force.*
3. Look, listen, and feel for looseness of the headset bearings.

**To check if the headset is too tight**

1. With the front wheel off the ground, slowly rotate the fork and handlebars to the right and left.
2. Look, listen, and feel for any grinding noises, or stickiness or binding at any point in the rotation; the bearings may be too tight.

On some BMX bikes, a rotor allows the handlebars to turn 360 degrees without interference from the brake cables by bridging across the headset. Rotor information is covered in the Brake System section.

**WARNING**

An improperly adjusted headset can cause you to lose control and fall. Make sure the headset is properly adjusted before riding the bike.
Adjustment

Headset bearing adjustment requires special tools and training, and should only be performed by your Trek dealer. Adjustment of the rotor is covered in the section Brake System.

Lubrication

Once a year re-grease the headset. This requires special tools and training, and should only be performed by your Trek dealer.
BRAKE SYSTEMS

The brake system allows you to slow or stop your bike, a function critical to your safety.

These instructions explain how to inspect, adjust, and lubricate a bicycle brake. Read the general information in *Braking system pointers- all systems* as well as the specific information for the type of brakes on your bike.

**Brake system pointers- all systems**

Different brake designs have varying amounts of stopping power. If you are dissatisfied, or uncomfortable, with the stopping power of your bicycle brakes, consult your Trek dealer.

With any braking system, failure to properly adjust, maintain, and use your brakes may result in a loss of control and injury. If you are unsure of the brake adjustment, or suspect any problem, do not ride your bicycle; have your Trek dealer service your bicycle.

The brake system is difficult to adjust properly without the proper tools and training. It is strongly recommended that adjustment of a brake be done by your Trek dealer. If you need more specific information regarding your brake system, contact your Trek dealer.

Some types of brakes are not compatible with some types of brake levers. With any brake, use only levers recognized as compatible, like those supplied with your bike. As an example, direct-pull brakes (Figure 3.7.2) have increased leverage and stopping power, requiring special brake levers to manage the power.

If your bike is equipped with brake levers offering adjustable braking force, read and follow the manufacturers instructions supplied with your bike before making any adjustment to the braking force.

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**WARNING**

Never ride a bike if you are not certain the brakes are working properly, or you if suspect a problem with the brake cables, or hydraulic hose. Malfunctioning brakes can cause you to lose control and fall. If your brakes are not working properly, re-adjust them or take the bike to your Trek dealer for service.
**Introduction**

This system consists of one of several types of hand-operated brake levers and brakes, including road caliper brakes (Figure 3.7.1), direct-pull brakes (Figure 3.7.2), U-brakes (Figure 3.7.4), and cantilever brakes (Figure 3.7.5). With this system, the lever is connected to the brake by a cable. By squeezing the lever, pressure is applied to the wheel rim by brake pads. This slows the rotation of the wheel, which slows the bike.

This system consists of several parts:
- Rim
- Brake lever
- Brake cable and housing
- Brake caliper

Never use rims designed specifically for disc brakes. Rim brakes require a flat sidewall on the rim for proper braking action.

**Inspection**

When the brakes are not applied, the brake pads should be 1-2mm from the rim. Brake pads should be aligned with the rim surface (Figure 3.7.3). If your brakes are too tight, too loose, or not centered on the rim, adjust them before riding the bike.

Figure 3.7.3 shows toe-in, an angular alignment of the brake pad, which can be adjusted to prevent squealing of the brakes. Used brake pads, or some new direct-pull type brakes, may not require toe-in.

![Figure 3.7.3 Brake pad alignment](image)

**Every month** check the brake cables on your bike for kinks, rust, broken strands, and frayed ends, and check the housing for bent ends, cuts, stretched coils, and wear. Replace any part which does not pass inspection.
Every month inspect the brake pads on your bike for wear. Brake pads have shallow grooves in their braking surface. If any of these grooves are less than 2 mm deep, or 1 mm deep for direct-pull brakes, replace the pads.

Every 3 months tighten bolts on brake levers (Figure 3.7.6-3.7.8):
- Lever clamp (Figure 3.7.3): 53-69 lb•in (6.0-7.8 Nm)
- Mid-bar lever (Figure 3.7.7): 20-30 lb•in (2.3-3.3 Nm)

Every 3 months tighten bolts on caliper brakes (Figure 3.7.1):
- Pad fixing: 40-60 lb•in (4.5-6.8 Nm)
- Brake fixing on:
  - metal seatstays: 70-85 lb•in (7.9-9.6 Nm)
  - 'curved' carbon fiber seatstays: 55-60 lb•in (6.2-6.8 Nm)

Every 3 months tighten bolts on direct-pull brakes (Figure 3.7.2), U-brakes (Figure 3.7.4), or cantilever brakes (Figure 3.7.5):
- Pad fixing bolts: 70-80 lb•in (7.9-9 Nm).
- Arm fixing bolts: 70-85 lb•in (7.9-9.6 Nm)

Adjustment

To adjust the reach to the brake lever
With some brake levers, you can change the reach, the distance from the handlebar to the lever.
1. Locate the reach adjustment screw (Figure 3.7.8) and turn. To increase the reach, turn the screw in (clockwise). To reduce the reach, turn the screw out (counter-clockwise).
2. If needed after adjusting the reach, re-adjust the pad clearance.

To adjust brake pad clearance to the rim
1. Turn the barrel adjuster. To increase the pad clearance, turn the barrel adjuster in (clockwise). To reduce the pad clearance, turn the barrel adjuster out (counter-clockwise).
For most direct-pull, cantilever, or U-brake systems, the barrel adjuster is on lever (Figure 3.7.8). For most road caliper systems (Figure 3.7.1), the barrel adjuster is on the brake itself.
With a double-pull lever (Figure 3.7.9) adjust the cable tensions so that the rear brake pads are at least as close to the rim as the front brake pads.
2. If the brake pads cannot be adjusted properly in this manner, loosen the cable clamp bolt and re-attach the cable as explained in To install a brake cable, but without removing the brake cable.

**To center a V-type, cantilever, or road brake**
1. Rotate the centering screw (Figures 3.7.1, 3.7.2, and 3.7.5). Turn in small increments and check for centering.
2. If the brake has two centering screws, adjust the overall spring tension while centering the brake.

**To center a U-brake**
1. Hold the 13mm centering nut with a wrench.
2. Loosen the arm fixing bolt with a 5mm allen wrench.
3. Rotate the centering nut (Figure 3.7.4).
4. Re-tighten the bolt.

**To adjust the alignment of the brake pads**
1. Loosen the brake pad fixing bolt.
2. Follow the procedures in Inspection to align and tighten the brake pads.
3. After the brakes are adjusted, test the brakes by applying maximum braking force to the levers. Ensure the cable does not slip, the pads close toward the rim at right angles, and the pads do not contact the tire.

**To install a brake cable**
Installing a brake cable in a cantilever brake requires special tools and training, so should only be done by your Trek dealer.
1. Note the path of the old cable, and loosen the brake cable anchor bolt and remove the worn cable.
2. Grease the new cable and reinstall, feeding it along the same path as the old cable, including through the cable anchor bolt.
3. Make sure the leaded cable-end is seated properly in the brake lever, and the housing is properly seated in the lever.
4. If needed, follow the instructions To adjust the alignment of the brake pads.
5. Turn the adjusting barrel clockwise so the threads on the adjusting barrel are not exposed above the caliper, or outside the lever.
6. Hold the brake pads against the rim, and tighten the bolt:
   • Cable clamp bolt: 52-69 lb•in. (6-8 Nm)

7. Cut the cable so that no more than 2 inches (51 mm) extends beyond the anchor bolt.

8. Crimp a metal cap or place a bit of solder on the end of the cable to prevent fraying.

9. Follow the instructions for Inspection and Adjustment.

To open the brake for wheel removal

After installing a wheel, follow the Inspection procedures in the Wheels section of this chapter to complete the installation.

• For most road calipers, lift the brake release lever (Figure 3.7.1) to the open UP position. To close, simply turn the lever to the Down position.

• For Campagnolo Ergopower levers, slightly depress the brake lever, and push the button (Figure 3.7.10) until it is flush with the lever body. Release the lever and the brake will open.

   To close, reverse the instructions.

• For cantilever brakes and U-brakes, release the linkwire (Figure 3.7.4). With one hand, squeeze the brake pads firmly against the rim. With the other hand, pull the leaded end of the linkwire from the retaining fork on the brake arm. Release the brake pads, and the brake will open.

   To close the brake, reverse the instructions.

• For direct-pull type brakes, disconnect the pipe from the link arm (Figure 3.7.11). With one hand, squeeze the pads firmly against the rim. With the other hand, pull the pipe back from the link arm, and lift the pipe. Once disconnected, let go of the brake pads and the brake will open.

   To close the brake, reverse the instructions.

Lubrication

Every 3 months lubricate your brake lever pivots and brake arm fixing pivots with a light oil. See your Trek dealer for a recommended oil.

Whenever a cable is replaced, lubricate the cable with a thin layer of Wrench Force® synthetic grease or a similar lubricant.
Introduction

Some rim brake systems also include a rotor, which allows the rear brake cable to bypass the headset such that the handlebars can be rotated a full 360 degrees. This capability is provided by a rotor (Figure 3.7.12) mounted to the headset. Since the rotor is a connection between the brake lever and the brake, its function is part of the brake operation. Proper rotor adjustment is critical to proper brake function.

Inspection

Once a month inspect the rotor for proper function. Watch the bearing unit as you rotate the handlebars 360 degrees. It should not move up or down, or tilt. When the brake lever is applied, the rotor should apply the brake firmly while the bearing unit remains parallel to the upper and lower cable stops. If the bearing unit tilts either when the brakes are applied, or when the handlebars are rotated, the rotor needs adjustment.

Adjustment

To adjust the rotor

1. Ensure that both lower barrel adjusters are flush with (do not show above) the lower cable stop, and the bearing unit is resting on the lower cable stop.

   The rear brake adjustment must be made with the bearing unit in this position. The bearing unit should be parallel to the upper and lower cable stops.

2. If it is tilted, there is slack in one of the cables. Pull each cable end, one at a time to see which cable has slack at the bearing unit.

3. Remove the slack through the barrel adjuster.

4. When even pull is achieved, tighten all barrel adjuster locknuts.

Lubrication

The rotor does not require lubrication.
CHAPTER THREE

Inspection, Adjustment & Lubrication

Introduction

The braking mechanism of an internal or drum brake is inside a hub, but it is actuated by a hand lever. The lever is connected to the brake by a cable. This system consists of several parts:

• Brake lever
• Brake cable and housing
• Rear hub

Inspection

Every month check that the brake cable clamp bolt is tight.

Every month check the brake cables on your bike for kinks, rust, broken strands, and frayed ends, and check the housing for bent ends, cuts, stretched coils, and wear. Replace any part which does not pass inspection.

Adjustment

To decrease lever movement

1. Loosen the locknut on the barrel adjuster (Figure 3.7.13) and turn the barrel adjuster.

   To increase the lever travel, turn the screw in (clockwise). To reduce the lever travel, turn the screw out (counter-clockwise).

2. After adjustment, tighten the locknut to hold this adjustment.

Rear wheel removal

To remove the rear wheel, you must first disconnect the shift and brake cables.

To disconnect the brake cable

Be careful not to touch the rear hub which may be hot from braking.

1. Press the cable carrier arm (Figure 3.7.13) forward, and the cable clamp bolt rearward, so the bolt aligns with the larger diameter hole in the carrier.

2. Pull the cable clamp bolt outward to disengage it from the carrier.

3. Slide the brake cable stop forward to remove it from the brake arm.

4. Undo brake strap bolt.

To disconnect the shift cable

1. Put the shifter in 1st gear.
2. Pull the cable housing out of the shift cable housing stop.
3. Rotate the shift cable fixing bolt until the washer flats align with the slit in the cog joint bracket.
4. Remove the cable.

**To unbolt the axle from the frame**

*When loosening and tightening the axle nuts, do so gradually, in small increments, to prevent effecting the bearing hub adjustment.*

1. Slightly loosen the axle nut on one side of the hub by about 1/4 turn.
2. Slightly loosen the axle nut on the other side of the hub about 1/4 turn.
3. Continue loosening the axle nuts in small increments until you can slide the hub from the dropouts.

**To install the wheel**

1. Reverse the instructions for removing the wheel, including gradual tightening of the axle nuts.
2. Reverse the procedure to connect the brake cable.
3. Reverse the procedure to connect the shift cable.
4. Check that the gear cable tension is correctly adjusted.
5. Follow the *Inspection* procedures in the *Wheels* section of this chapter complete the installation.

**Cable installation**

Follow the instructions *To install a brake cable*, page 47.

**Lubrication**

*Every 3 months* lubricate the brake lever pivots with Wrench Force synthetic chain lube or a similar light oil.

*Whenever a brake cable is installed*, lubricate the cable with a thin layer of Wrench Force synthetic grease or a similar lubricant.
Hydraulic disc brakes

Introduction

Instead of pressing on the wheel rim to slow the bike, this braking system presses on a disc that is mounted on the wheel hub (Figure 3.7.14). The disc is attached to the hub with bolts, and a disc brake caliper is attached to the left side of the frame or fork. A special lever, which functions as the brake fluid reservoir, is connected to a hydraulic hose to actuate the brake.

This system consists of several parts:
- Brake lever/ fluid reservoir
- Hydraulic hose
- Brake caliper and disc

Read the brake manual that came with your bike. If you did not receive a brake manual, get one from your dealer, contact us and we’ll send you one, or download one from an internet site: www.hayesbrake.com

The following information is only meant to supplement the brake manufacturer’s manual.

Disc brake fluid is very corrosive. Avoid contact with your skin, or the bicycle; brake fluid removes paint.

Disc brakes may be very hot after use, so use care when inspecting them. As with other rotating parts on a bicycle, avoid placing your fingers in the disc.

⚠️ WARNING
Disc brakes and discs get very hot during use and could burn skin. Also, the disc edges may be sharp and could cut skin. Avoid touching the disc or disc brake when hot, or when rotating.

Do not operate the brake lever when the disc is not in the caliper. If the lever is pulled with the disc removed from the brake, the self-adjusting pad clearance will be set at almost zero, so the disc cannot be re-inserted between the brake pads. In this case, refer to your disc brake owner's manual.

Inspection

Before every ride squeeze the brake lever firmly. It should not be possible to pull the lever fully to the handlebar. If the brake lever can be pulled to the handlebar, the brake system
must be bled. Bleeding brakes takes special tools and training; take your bike to your Trek dealer for service.

Check that there is no oil, grease, or other dirt on the disc. The disc (Figure 3.7.14) is part of the braking system, so keep it clean at all times. Remove the brake pads from the caliper during heavy cleaning. Do not use cleanser, de-greaser, or solvents to clean the disc. To clean discs, use isopropyl alcohol.

**Once a month** inspect disc brake pads for wear. If disc brake pads are less than 1.0 mm thick, replace the pads. Check that the brake pads are in proper position, allowing 0.25 to 0.75 mm clearance from the disc when the brakes are not applied (Figure 3.7.15). Spin the wheel; when the brake lever is not pressed, the brake pads should touch as little as possible on the disc.

Tighten the disc brake bolts (Figure 3.7.16):
- Caliper mounting bolts: 100-110 lb\cdot in (11.3-12.4 Nm)
- Adapter mounting bolts using a 5mm allen wrench: 100-110 lb\cdot in (11.3-12.4 Nm)
- Adapter bolts using 4mm allen wrench: 60-65 lb\cdot in (6.8-7.3 Nm).
- Disc attachment bolts holding the disc to the hub: 45-55 lb\cdot in (5-6.2 Nm)
- Brake lever attachment bolts: 25-35 lb\cdot in (2.8-4 Nm)

Check the brake hose for kinks or leakage. Replace any part of hydraulic hose which does not pass inspection. Replacing hydraulic hose requires re-adjustment of the braking system with special tools and training and should only be done by your Trek dealer.

**Adjustment**

**To adjust the distance from the brake lever to the handlebar**

1. Locate the reach adjustment screw between the lever and the handlebar, near the lever pivot.
2. To increase the reach, turn the screw in (clockwise). To reduce the reach, turn the screw out (counter-clockwise).

**To align the brake with the disc**

1. Loosen the brake mounting bolts.
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Inspection, Adjustment & Lubrication
Brake Systems

2. Apply the lever fully, and gradually tighten the bolts as specified in Inspection.

To remove the brake pads
1. Remove the wheel.
2. With your fingers, or thin-tipped pliers, grasp the installation tang of the brake pad (Figure 3.7.17) and pull out.

Wheel removal

Removing a wheel with a disc brake does not require opening the brake. Follow the instructions To remove a wheel on pages 64-65, and simply slide the disc out of the brake.

When installing the wheel, carefully guide the disc between the brake pads. If the edge of the disc is pressed against the pads with force, the pads could be chipped or damaged, which then requires replacement of the brake pads.

Lubrication

Every 3 months lubricate the brake lever pivots with Wrench Force® synthetic chain lube or a similar light oil.

Hydraulic disc brake calipers require no lubrication.
Introduction

Instead of pressing on the wheel rim to slow the bike, this braking system presses on a disc that is mounted on the wheel hub (Figure 3.7.18). The brake is actuated by a brake cable operated with a standard brake lever. The disc is attached to the hub with bolts, and a disc brake caliper is attached to the left side of the frame or fork. This system consists of several parts:

- Brake lever
- Brake cable and housing
- Brake caliper and disc

Disc brakes may be very hot after use, so use care when inspecting them. As with other rotating parts on a bicycle, avoid placing your fingers in the disc.

⚠️ WARNING

Disc brakes and discs get very hot during use and could burn skin. Also, the disc edges may be sharp and could cut skin. Avoid touching the disc or disc brake when hot, or when rotating.

Inspection

**Before every ride** squeeze the brake lever firmly. It should not be possible to pull the lever fully to the handlebar.

Check that there is no oil, grease, or other dirt on the disc. The disc (Figure 3.7.18) is part of the braking system, so keep it clean at all times. Remove the brake pads from the caliper during heavy cleaning. Do not use cleanser, de-greaser, or solvents to clean the disc. To clean discs, use isopropyl alcohol.

**Once a month** inspect disc brake pads for wear. If disc brake pads are less than 1.0 mm thick, replace the pads. Check that the brake pads are in proper position, allowing 0.25 to 0.75 mm clearance from the disc when the brakes are not applied (Figure 3.7.19). Spin the wheel; when the brake lever is not pressed, the brake pads should touch as little as possible on the disc.
Tighten the disc brake bolts (Figure 3.7.20):
- Caliper mounting bolts: 100-110 lb•in (11.3-12.4 Nm)
- Adapter mounting bolts using a 5mm allen wrench: 100-110 lb•in (11.3-12.4 Nm).
- Adapter bolts using 4mm allen wrench: 60-65 lb•in (6.8-7.3 Nm).
- Disc attachment bolts holding the disc to the hub: 45-55 lb•in (5-6.2 Nm).
- Cable clamp bolt: 50-70 lb•in (5.7-7.9 Nm).

**Every month** check the brake cables on your bike for kinks, rust, broken strands, and frayed ends, and check the housing for bent ends, cuts, stretched coils, and wear. Replace any part which does not pass inspection.

### Adjustment

**To adjust the reach to the brake lever**

*With some brake levers, you can change the reach, the distance from the handlebar to the lever.*

1. Locate the reach adjustment screw (Figure 3.7.21) and turn. To increase the reach, turn the screw in (clockwise). To reduce the reach, turn the screw out (counter-clockwise).

2. If needed after adjusting the reach, re-adjust the pad clearance.

**To adjust right brake pad clearance to the disc**

1. Turn the fixed pad adjuster (Figure 3.7.22). To increase the pad clearance, turn the barrel adjuster in (clockwise). To reduce the pad clearance, turn the barrel adjuster out (counter-clockwise).

2. If the pads cannot be adjusted properly in this manner, follow the instructions **To adjust left brake pad clearance to the disc**, and re-set the right pad.

**To adjust left brake pad clearance to the disc**

1. Turn the cable barrel adjuster. To increase the pad clearance, turn the barrel adjuster in (clockwise). To reduce the pad clearance, turn the barrel adjuster out (counter-clockwise).

2. If the pads cannot be adjusted properly in this manner, loosen the cable clamp bolt and re-attach the cable as explained in **To install a brake cable**, page 47, but without removing the cable.
3. After adjustment, turn the locking nut clockwise to help prevent rotation of the barrel adjuster.

**To align the brake with the disc**

1. Loosen the brake mounting bolts.
2. Slide a business card, or similar thin object, between the right brake pad and the disc.
3. Apply the lever fully, and gradually tighten each mounting bolt as specified in *Inspection*.

**To remove the brake pads**

1. Remove the wheel.
2. With your fingers, or thin-tipped pliers, grasp the installation tang (Figure 3.7.23) of the brake pad and pull out.

**Wheel removal**

Removing a wheel with a disc brake does not require opening the brake. Follow the instructions *Wheel removal and installation* on pages 64-65, and simply slide the disc out of the brake.

When installing the wheel, carefully guide the disc between the brake pads. If the edge of the disc is pressed against the pads with force, the pads could be chipped or damaged, which then requires replacement of the brake pads.

**Lubrication**

*Every 3 months*, lubricate the brake lever pivots, and the part of the brake caliper that rotates when the brake lever is pulled, with a light oil. See your Trek dealer for a recommended oil. Be careful not to get oil on any other part of the brakes.

*Whenever a cable is installed*, lubricate cables with a thin layer of Wrench Force® synthetic grease or a similar lubricant.

**Cable installation**

Follow the instructions *To install a brake cable*, page 47.
Introduction

Instead of operating by hand, coaster brakes are actuated with the legs by pedalling the crankarms backwards. The chain transmits the motion of the crankarms to the rear hub. The braking mechanism is actually inside the rear hub. This system consists of several parts:

- Rear hub
- Chain and crankset

Inspection

Once a month check that the brake arm attachment bolt is tight and that the brake strap is securely fastened to the chainstay (Figure 3.7.24).

Once a month, or whenever the wheel is installed, check the chain tension. Without proper tension, the chain can come off, and the brake will not work. See Drivetrain on pages 32-34 for Inspection and Adjustment of chain tension.

Adjustment

See Drivetrain on pages 32-34 for Adjustment procedures.

Rear wheel removal

To unbolt the brake arm

1. Loosen and remove the brake arm attachment bolt (Figure 3.7.24).

To unbolt the axle from the frame

When loosening and tightening the axle nuts, do so gradually, in small increments, to prevent effecting the bearing hub adjustment.

1. Slightly loosen the axle nut on one side of the hub by about 1/4 turn.

2. Slightly loosen the axle nut on the other side of the hub about 1/4 turn.

3. Continue loosening the axle nuts in small increments until both nuts are loose enough to slide the hub from the dropouts.

With bikes equipped with training wheels, there is a second set of axle nuts under the training wheel brackets. Loosen and remove them in the same manner.
To install the wheel

1. Loop the chain over the hub (not the rear cog), and slide the hub into the dropouts.
2. Push the wheel fully forward, lift the chain onto the rear cog, and pull the wheel back until the proper chain tension is achieved.
3. While holding the wheel straight in the frame, maintain chain tension and reverse the instructions for removing the wheel, including gradual tightening of the axle nuts.
4. If necessary, re-tension the chain (with the chain tensioners, if so equipped).
5. Re-adjust training wheels, if so equipped, and tighten the secondary axle nuts.
6. Re-install the coaster brake arm, and tighten the brake arm attachment bolt, if so equipped.
7. Follow the Inspection procedures in the Wheels section of this chapter complete the installation.
8. Spin the wheel to see that it is centered and the wheel turns freely without rubbing.
9. Make sure the brake is working properly.

Lubrication

Coaster brakes do not require additional lubrication. Follow the recommendations in the Wheels section for lubricating hub bearings.
WHEELS

Introduction

The wheels (Figure 3.8.1) of a bicycle allow the bike to roll down the road smoothly, so their integrity and structural soundness is crucial. In addition, their relationship to the performance of your brakes is of great importance.

These instructions explain how to inspect, adjust, and lubricate the wheels of a bicycle.

Inspection

The best maintenance of a wheel is preventative maintenance. Be aware of the things that can go wrong, so you can stop trouble before it happens. Before every ride check that your quick-release hubs are in their CLOSED (locked) position, or that your wheel axle nuts are tight. For further information on adjusting quick-release hubs, see the Adjustment section, or consult your Trek dealer. Check that the wheels are straight and round by spinning them. If the rim (Figure 3.8.1) does not spin evenly, have your wheel trued (straightened) by your Trek dealer. Make sure your tires are inflated to the pressure indicated on the tire sidewalls. Use a gauge and a bicycle pump whenever possible. Avoid filling your tires at gas stations. Because of the greater pressure and volume of air their pumps release, blowouts are very possible. Inspect your tires for wear and any other damage. If a tire has any cuts or separations which go through the tire, making any part of the inner tube visible, or if any part of the tire casing shows through the tire tread (running surface) or knobs are worn or missing, replace the tire. Make sure your rims are clean. Dirty or greasy rims render your brakes ineffective. Wipe your rims with a clean rag or wash them with soap and water, rinse, and let them air dry.

Every week make sure there are no loose, damaged, or broken spokes. If a wheel is not in good condition, both the effectiveness of the brakes and the strength of the wheel are greatly reduced.

WARNING

An improperly adjusted hub, where there is movement between the hub and axle, can cause you to lose control and fall. Inspect the hubs thoroughly before every ride, and do not ride the bicycle until any problem has been corrected.
Every month check that both hub bearings are properly adjusted. Lift the front end of the bicycle off the ground with one hand and attempt to move the rim laterally, left to right. Look, feel, and listen for any looseness in the hub bearings. Spin the wheel, and listen for any grinding or other unusual noises. If the hub feels loose or makes any noise, the hub needs an adjustment. Repeat these procedures for the rear wheel.

Every month, check your rims for wear. On adult-size bicycles there may be wear indicators in the braking surface, either a continuous indented band or several small spherical indentations at even intervals around the rim. If the braking surface has worn so that any part of these indicators is no longer visible, have your dealer replace the rim.

Before installing tires make sure a rim strip is in place which completely covers the rim web (wall to wall) so that all spoke holes are completely covered.

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**WARNING**

Make sure the rim strip covers all of the spoke holes or spoke heads. If they are exposed, the inner tube could be punctured and lose air suddenly causing you to lose control and fall. Make sure the rim strip properly covers all spoke holes.

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**Adjustment**

To adjust wheel bearings
This procedure requires special tools and training, so should only be done by your Trek dealer.

**Quick-release adjustment and closure**
For proper and safe adjustment of a quick-release, read and follow these instructions carefully.

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**WARNING**

A quick-release that is not properly adjusted and closed may allow the wheel to be loose or come off unexpectedly, causing you to lose control and fall. Make sure the quick-release is adjusted and closed properly before riding the bike.
To adjust the tension of a quick-release

1. Move the quick-release lever to the **OPEN** position (Figure 3.8.2) and set the wheel so it firmly touches the inside of the fork ends.

2. With the lever about halfway between the **OPEN** position and the **CLOSED** position, tighten the quick-release adjusting nut (Figure 3.8.3) until finger-tight.

3. Place the lever in the palm of your hand and throw the lever as shown in Figure 3.8.4 to the **CLOSED** position (Figures 3.8.6-3.8.7). At the half-closed position of the lever, there should be some resistance.

   • Do not tighten the quick-release wheel retention mechanism by turning the lever like a wing nut (Figure 3.8.5); it will not result in sufficient force to hold the wheel in place.

4. If it requires more than 45 pounds (200 Newton) force to completely close the quick-release lever, open the lever and slightly loosen the quick-release adjusting nut.

5. If it requires less than 12 pounds (53.4 Newton) force to begin to open the lever from the fully closed position, open the lever and slightly tighten the quick-release adjusting nut.

6. Orient the quick-release levers so they do not interfere with any other bicycle part or accessory part (such as rack or fenders), and so obstacles in the path of the bicycle cannot snag the levers (Figures 3.8.6-3.8.7).

For further information on correct adjustment of the quick-release tension, read Figure 3.8.8.

If it requires more than 45 pounds (200 Newton) force to completely close the quick-release lever, open the lever and slightly loosen the quick-release adjusting nut.

If it requires less than 12 pounds (53.4 Newton) force to begin to open the lever from the fully closed position, open the lever and slightly tighten the quick-release adjusting nut.

Repeat the adjustment if necessary.
7. Test that you have properly adjusted and closed the quick-release. If the quick-release fails any test, either repeat these adjustment procedures, including these tests, or take your bicycle to your Trek dealer for service.

**Test for proper quick-release adjustment**
- Pick up the bike, and sharply hit the top of the tire (Figure 3.8.9). The wheel must not come off, be loose, or move from side to side.
- Make sure the quick-release lever cannot be rotated parallel to the wheel (Figure 3.8.10).
- When the quick-release is properly tightened, and clamped by the lever in the closed position, the clamping force is adequate to cause metal-into-metal engagement (embossing) of the dropout surfaces.
- See Figure 3.8.8.

**Threaded axle-nut wheel retention**

If your bicycle is equipped with threaded axle-nuts instead of quick-release mechanisms, make sure the axle nuts are tightened correctly:
- Front wheel: 180-240 lb•in (20.3-27.1 Nm)
- Rear wheel: 240-300 lb•in (27.1-33.9 Nm)

For each wheel, test to ensure that you have properly tightened the axle-nuts. If the axle-nuts fail the test, either repeat these procedures, including these tests, or take your bicycle to your Trek dealer for service.

**Test for proper axle-nut adjustment**
- Pick up the bike, and sharply hit the top of the tire (Figure 3.8.9). The wheel must not come off, be loose, or move from side to side.

**WARNING**

A wheel axle-nut that is not properly tightened may allow the wheel to be loose or come off unexpectedly, causing you to lose control and fall. Make sure the axle-nuts are tightened properly before riding the bike.
Redundant retention washers

For the front wheel of children’s bikes and BMX bikes with axle nuts, a special toothed washer must be in place on both sides of the hub for correct wheel retention. The toothed washer is placed on the outside of the fork tip with the tooth in the corresponding hole in the fork tip (Figure 3.8.11).

Pegs on BMX bikes

Some bikes have tubular axle extensions, called pegs (Figure 3.8.12). For bikes with pegs on the front wheel, the toothed washer must be against the fork tip as in Figure 3.8.11, with the peg installed over the toothed washer. Additional washers and nut go inside the peg. Tighten axle-nuts in pegs:

- Using a 15 mm socket: 220-240 lb•in (24.9-27 Nm)
- Using a 19 mm socket: 350 lb•in (40 Nm)

Tricycle wheel retention

On a tricycle front wheel, make sure the axle clamp bolts (Figure 3.8.13) on both sides of the fork are tight:

- Front wheel: 150-280 lb•in (17-20.3 Nm).

Adjusting tire pressure

If you cannot keep the proper pressure in a tire, it probably has a leak in the tube. The section on pages 71-73, Tire Installation, includes instructions to fix the tube leak. If you do not have the proper tools, take the bike to your Trek dealer for repair.

Wheel removal and installation, for bikes with a rear derailleur

These instructions explain how to remove and install a wheel. For some parts of these procedures, the instructions refer you to information already covered earlier in the Wheels and Brake Systems sections of this chapter.

Note: For rear wheels with internal brakes, or coaster brakes, follow the instructions To remove the rear wheel for that brake type in the Brake Systems section.
To remove a wheel

1. Shift to the smallest rear cog.
2. Open the brake by following the instructions To open the brake, for your type of brakes, in the Brakes section.
3. Open the wheel quick-release, or loosen the axle nuts.
4. For a rear wheel, hold the derailleur cage with your thumb (Figure 3.8.14), and unwind the derailleur cage (Figure 3.8.15).
5. Slide the wheel out of the dropouts.

To install a wheel

1. For a rear wheel, rotate the derailleur back, while unwinding the derailleur cage with your thumb (Figure 3.8.15). Place the chain on the small cog.
2. Place the wheel in the frame or fork, making sure that the axle is inserted all the way into the dropouts.
3. Re-install and adjust the quick-release or tighten the axle nuts as shown in the Wheels section.
4. Close the brake.
5. Test the brake to make sure it is properly adjusted.
6. Spin the wheel to see that it is centered and the wheel turns freely without rubbing.

Lubrication

Every year, re-grease wheel bearings. This requires special tools and training, so should only be done by your Trek dealer.

Every year, lubricate wheel quick-release. Apply several drops of Wrench Force® synthetic lube or a similar light oil where the quick-release lever rotates in the quick-release body.

Tubeless-compatible wheel system

Some Trek bikes are equipped with rims marked "Tubeless." For more information on this system, see Tubeless Compatible Wheel System on pages 74-78.
REFLECTORS

Introduction

The reflectors on your bicycle illuminate when a light is shone on them, directing some of the light back to the source. In poor lighting conditions, if an oncoming vehicle has their lights on, the reflectors may help the other vehicle see your bike. Reflectors are an important part of your bicycle’s safety equipment. Do not remove the reflectors from your bicycle.

Inspection

Every three months, make sure all the nuts and bolts holding the front, rear, pedal, and wheel reflectors are tight. Check that front and rear reflectors are oriented so their reflective surfaces are perpendicular to the ground, and that all reflective surfaces are clean and in good condition. The front reflector should point directly forward, and the rear should point directly back. The rear reflector should be at least three inches below the top of the seat.

Schraeder and Presta Valves

There are two styles of valves used on Trek bicycles (Figure 3.8.16), which use different use techniques for inflation:

- Schraeder valve- remove the valve cap, attach an air pump with a Schraeder fitting, and inflate. Put the cap back on, as the cap keeps dirt and debris out of the valve.

- The Presta valve is also known as a French valve. To inflate a Presta valve, remove the valve cap, if present. Presta valves seal very tightly, and require a lot of pressure to open them initially, so after unscrewing the valve nut, depress the nut with your finger to open the valve. This should let a little air out. Inflate using a Presta valve fitting. After inflation, tighten the valve nut against the valve stem until finger-tight. This provides the same function as the valve cap on a Schraeder valve.
These instructions are written for standard wheel systems where the air inside the tire is contained in an inner tube.

Follow these steps when repairing or replacing a tube in the event of a flat tire, or when replacing a worn tire.

**To remove a wheel from the bike**
1. Follow the instructions *To open the brake*, in the *Brake System* section of this chapter.
2. Follow the instructions *To remove a wheel*, in the *Wheels* section of this chapter.

**To remove the tire from the wheel**
Remove the tire from the rim with your hands, or tire levers.

*Do not use sharp objects such as a screwdriver to remove the tire.*
1. Deflate the tire completely.
2. Working your way all around the wheel, squeeze the tire beads into the bottom of the rim well.
3. Starting opposite the valve, lift one tire bead up and out of the rim.
4. Continue around the wheel lifting the bead out until one bead is completely free (Figure 3.8.18).
5. Reach up into the tire and remove the inner tube.
6. Remove the second tire bead from the rim.

**To install a tire on the wheel**
1. If you are repairing a tube leak, repair the puncture on the tube with a tube patch, or replace the tube.
2. Follow the *Inspection* procedures in the *Wheels* section to check the rim and inside of the tire.
   *If you are replacing the tube or tire, make sure the new tube or tire is the same size as the old one, or check with your Gary Fisher dealer for compatibility of differing sizes. The size can be found on the side of the tire.*
3. Inflated the tube until it begins to take shape.
4. Place the tube in the tire.
5. Insert the tube valve stem through the hole in the rim.
6. Starting at the valve stem, install the first bead onto the rim (Figure 3.8.17).

7. Push the tire and tube over so the tube is inside the rim (Figure 3.8.18).

8. Again starting at the valve stem, carefully push the second bead into the rim using your hands. *Be careful not to pinch the tube between the rim and the tire (Figure 3.8.19) when mounting the tire.*

9. Push the base of the valve stem up into the tire, so that it is not caught between the tire beads and the rim.

10. Inflate the tire to about half pressure while checking that the tire bead is properly seated in the rim (Figure 3.8.20).

11. Deflate the tire again.
   *This will help avoid any pinching of the tube.*

12. Inflate the tire to the pressure indicated on the side of the tire.

**To install the wheel on the bike**

1. Follow the instructions *To install a wheel*, in the *Wheels* section of this chapter.

2. Follow the instructions *To close the brake*, in the *Brake System* section of this chapter.
These instructions are written for the Trek tricycle rear wheel (Figure 3.8.21), where a split rim design holds a standard tire and tube, and where the air inside the tire is contained in an inner tube.

Follow these steps when repairing or replacing a tube in the event of a flat tire, or when replacing a worn tire. To repair a flat rear tire, it is not necessary to remove the wheel from the axle.

To remove the tire from the wheel
1. Deflate the tire completely.
2. Loosen and remove all the rim bolts, and separate the rim halves.
3. Remove the tire from the rim with your hands.

To install a tire on the wheel
1. If you are repairing a tube leak, repair the puncture on the tube with a tube patch, or replace the tube.
2. Follow the Inspection procedures in the Wheels section to check the rim and inside of the tire.
   If you are replacing the tube or tire, make sure the new tube or tire is the same size as the old one, or check with your Trek dealer for compatibility of differing sizes. The size can be found on the side of the tire.
3. Inflate the tube until it begins to take shape.
4. Place the tube in the tire.
5. Insert the tube valve stem through the hole in the rim.
6. Bolt the rim halves together and tighten to 180-220 lb•in (20.3-24.9 Nm)
   Be careful not to pinch the tube or the tire between the rim halves when mounting the tire.
7. Inflate the tire to about half pressure while checking that the tire bead is properly seated in the rim.
8. Deflate the tire again.
   This will help avoid any pinching of the tube.
9. Inflate the tire to the pressure indicated on the side of the tire.
Some Trek bicycles are equipped with a Bontrager tubeless-compatible wheel system. This system can be used with "Tubeless" tires, and also with standard tires when an inner tube is used. The tubeless mode requires special parts:

- Tubeless tire
- Tubeless rim
- Tubeless rim strip
- Tubeless valve stem

On some models of bicycles, "Tubeless-compatible" wheelsets are sold without these components installed.

A 'regular' tire fits the tubeless-compatible rim, but a regular tire requires an inner tube since it does not have an impermeable layer to hold the air. This section explains other requirements of this system, and includes installation instructions.

**WARNING**

A standard tire will not hold air without an inner tube and it could lose air suddenly causing you to lose control and fall. Always use an inner tube with a standard tire.

**Avoiding leaks with a tubeless tire**

A properly mounted tubeless tire will 'bleed' air, up to 4 PSI (0.25 ATM) per day. If a tubeless tire loses air faster than this, check potential leakage sites. Dirt, sand, grime, or roughness on any of the sealing surfaces may cause a tubeless tire to leak. Check that the valve nut is tight, check for punctures, and check all sealing surfaces:

- Tire to rim contact
- Tire to rim strip contact
- Valve stem to rim strip contact
- Rim strip to rim contact.

If a tubeless tire is punctured, a small hole (less than 3mm) can be patched from the inside of the tire with a sticky glueless patch. If the puncture hole is greater than 3mm, or the tire casing is damaged with broken threads instead of merely punctured, replace the tire. If the air is leaking from the rim strip, install a new rim strip.

If the air leaks rapidly and you can't find the air source, it may be difficult to inflate the tire enough to locate the puncture. However, its easy to convert from tubeless to the use of a standard inner tube.
A tubeless tire must be complete sealed to the rim

Before a tubeless tire can be inflated, both beads must make full contact with the rim strip at the bottom of the rim well, all the way around the rim. For this to happen, a tubeless tire must fit more tightly on the rim than a conventional tire. With a snug fitting tubeless tire, bare-handed installation may be difficult. If you use tire levers for installation or removal, avoid damaging the rim or abrading the tire beads. If either surface is roughened, air may bleed excessively from the mounted tire.

If the tire beads are sealed on the rim strip, air pressure will push the beads up to the rim hooks, where they can seal tightly. You don't need a compressor to do this; a good floor pump or an air cartridge will work. Even a hand pump may work, if nothing else is available.

To install a valve stem

1. Center the tubeless rim strip in the rim, and align the valve holes of the rim strip and rim.
2. Align the slot on the head of the tubeless valve with the rim (Figure 3.10.1), and press the valve stem through the rim strip and the rim.
3. Thread the tubeless valve nut (Figure 3.10.1) onto the valve, and tighten firmly by hand. There should be no gap between the valve and the rim strip.
4. Make sure the rim strip is smooth, even, and centered in the rim well.

To install a tubeless tire.

It is recommended to lube the tire and rim with soapy water to aid in tire installation and seating of the bead.

1. Starting opposite the valve, lay one tire bead into the center of the rim well.
   Note: If you start at the valve, the bead will lie on top of the valve, which will take up some slack needed to lift the tire bead over the rim shoulder (Figure 3.10.2).
2. Start opposite the valve again, and install the second tire bead until there is about 10 inches (25cm) of bead left outside the rim.
3. Roll the tire, along with both beads, so the second bead is at the bottom of the rim well (Figure 3.10.3). This provides some slack in the beads.

4. Finish installing the second bead.

**To inflate a tubeless tire**

*Note: To help remove any gaps between the tire beads and rimstrip, hold both beads, adjacent to the valve stem, up and out of the center channel with your fingers.*

1. Begin to inflate the tire, filling it as rapidly as possible to about 60PSI (4 ATM), until the tire beads snap into the rim hooks (Figure 3.10.4). Most tires have lines or marks running around the casing, just above the bead. When the tire is correctly installed, these lines are at an even distance from the rim.

2. When the beads are correctly seated all around the rim, inflate (or deflate) the tire to the desired pressure.

---

**WARNING**

*If a tubeless tire has insufficient air pressure it could lose air suddenly causing you to lose control and fall. Always ride with tubeless tires inflated to a minimum of 30PSI (2 ATM.)*

---

**To remove a tubeless tire**

On tubeless-compatible rims the bottom of the well is too narrow for both beads to rest fully against the rim bottom at the same time, so the tire must be rolled to "stack" the beads and get one bead at the bottom.

1. Let all the air out of the tire.
2. With the wheel facing you, roll the tire up and away from the rim with your thumbs (Figure 3.10.5) while you use your fingers to stack the beads (Figure 3.10.3).

3. At the valve, pull the lower, slacker bead of the tire up, out, and away from the rim (Figure 3.10.6).

4. Keep pulling the loosened bead up and out of the rim, rolling and pushing the tire toward the hub until the bead is completely off the rim.

5. Remove the other bead, starting at the valve.

**To remove the valve stem**

1. Remove the tubeless valve nut (Figure 3.10.1).

2. Thread the presta nut into the valve stem, and push the stem out of the rim.

**To install a tire and inner tube**

With an inner tube, either a conventional or tubeless tire can be used.

1. Make sure the rim strip is centered in the rim well and fully covers all spoke holes.

2. Install the tire and tube in the normal manner.

**To change to a tubeless tire**

1. Remove the tire and inner tube.

2. Make sure the rim strip is centered in the rim well and fully covers all spoke holes.

3. Follow the instructions To install a valve stem.

4. Follow the instructions To install a tubeless tire and To inflate a tubeless tire.

**To remove the rim strip**

If the rim strip is to be used again, be careful not to mar, tear, or stretch the valve hole.

1. Follow the instructions To remove a tubeless tire and To remove the valve stem.

2. Insert a round-bladed screwdriver (or similar tool) through the valve hole in the rim strip, and between the rim and rim strip (Figure 3.10.7).

3. Lift the rim strip with the screwdriver, and place a tire lever underneath the rim strip.
4. With the tire lever, lift and roll the rim strip over the opposite rim hook (Figure 3.10.8).

5. Continue to roll the rim strip up and out of the rim as you work your way fully around the rim.

To install the rim strip

There are two styles of tubeless rim strips; one for symmetric rims, and one for asymmetric rims where the spoke bed is not centered in the rim. Make sure you are installing the correct type of strip for your rim, and that if you are installing an asymmetric rim strip, that you have correctly oriented it with the rim.

Make sure the rim strip is in good condition, with no tears, holes, or deformed areas near the valve hole or along its edges.

1. Align the valve hole in the rim with the valve hole in the rim strip.

2. Place the tubeless valve stem through the rim strip valve hole, and then the rim.

   Note: the ‘U’ shape of the rim strip should face the same direction as the ‘U’ shape of the rim well (Figure 3.10.9).

3. Work the rim strip into the rim, moving away from the valve stem in both directions until six to ten inches (15 to 25cm) rim strip remain outside the rim.

4. With your fingers, lift and slightly stretch the rim strip so that it can be laid flat in the rim well.

5. Follow the appropriate installation procedures to install a tire.
A suspension fork, like a shock absorber, allows the front wheel to move over bumps with less vertical motion transmitted to the bike or rider.

Suspension forks require regular lubrication to work smoothly and to provide long seal life. Read the Suspension Fork Owner's Manual you received with your bike. If you did not receive a fork manual, get one from your dealer, contact us and we’ll send you one, or download one from an internet site:

www.rockshox.com
www.answerproducts.com (for Manitou forks)
www.marzocchi.com

The following information is only meant to supplement the fork manufacturer’s manual.

Inspection

**Before every ride**, ensure that the suspension fork is operating properly. Do not ride with less than the minimum clearances between the top of the tire and the bottom of the fork crown (Figure 3.11.1), listed in the Suspension Fork Owner's Manual supplied with your suspension fork.

Adjustment

The softness of the suspension fork spring, also called the preload, may be adjustable. Damping, the control of the speed of the spring, may also be adjustable (Figure 3.11.2). Follow the instructions in the Suspension Fork Owner’s Manual supplied with your suspension fork.

Changing your suspension will affect handling and braking characteristics. After making a change, carefully test the bike in a low traffic area until you are familiar with its performance.

Lubrication

Follow the Lubrication and Maintenance instructions in the Suspension Fork Owner’s Manual supplied with your suspension fork.

**WARNING**

An improperly adjusted or tightened suspension fork can cause you to lose control and fall. Make sure the suspension bolts are tightened properly, and the minimum tire clearance is correct, before riding the bike.
SUSPENSION SYSTEMS: REAR SHOCKS

Rear suspension allows the rear wheel to move over bumps with less vertical motion transmitted to the bike or rider. If your bicycle is equipped with rear suspension, ensure that it is operating properly before every ride. Read the Rear Shock Owner's Manual you received with your bike. If you did not receive a shock manual, get one from your dealer, contact us and we’ll send you one, or download one from an internet site:

www.rockshox.com
www.foxshocks.com

The following information is only meant to supplement the shock manufacturer’s manual.

Read the general information in Suspension pointers- all systems as well as the specific information for your type of rear suspension, covered on the following pages.

Rear suspension pointers- all systems

To get the best performance from your rear suspension system, maintain its parts well
• Mainframe
• Swingarm
• Bearings
• Attachment hardware
• Rear shock

To work properly, all attachment hardware must be correctly tightened, and the rear shock must be adjusted to your weight, your riding style, and the terrain you are riding on.

Keep your suspension components clean. Dirt, mud, and other contaminants can work into the suspension components, causing premature wear or excess friction. To clean your suspension system, use a soft cloth, a brush with soft bristles, and a solution of soapy water. Rinse with clean water. Do not use solvents or chemical cleaners, as they can remove the lubrication from the bearings or rear shock.

Changing your suspension settings will affect handling and braking characteristics. After making a change, carefully test the bike in a low traffic area until you are familiar with its performance.

Lubrication- all systems

No lubrication is required for the shock or the pivot of your Trek full suspension bike. Avoid all lubricants as they may damage the cartridge or composite bearings. For best results and long life, simply wash the shock and pivot area with a solution of soap and water, or just water.
This system connects the swingarm to the mainframe with a short rocker linkage (Figure 3.12.1).

**Inspection**

**After every 10 hours of use** inspect the shock mounting bolts and the pivot bolts for tightness. Remove the nut from the bolt or axle, clean the threads thoroughly, and apply a thread-locking compound (Loctite 242 is excellent).

Tighten the bolts to these torques:
- Shock mounting bolts 133-164 lb•in (15.0-18.5 Nm).
- Pivot axle bolts 95-115 lb•in (10.7-13.0 Nm).
- Rocker bridge bolts 50-75 lb•in (5.7-8.5 Nm).

**Once a month** check for bearing wear. Place one hand on top of the rear tire, and grasp the seatpost with the other. Try to move the rear wheel from side to side, and the seatpost up and down. If you feel any looseness, take the bike to your Trek dealer for service.

**Suspension adjustment**

Your shock owner’s manual tells you how to adjust the rear shock for most bike designs. This information makes tuning suggestions specifically for the Fuel.

For an all-round ride, set the forks for about 15% sag (12mm), and the rear shock at about 25% sag (9mm) sag. If your riding is slower or more technical, you may want slightly more sag. If you ride really fast, or on smoother terrain, you may like less. Find the correct pressures for the starting sag in the chart below, then try increments of 5 to 10PSI (0.25 to 0.5ATM). If the shock has damping adjustment, set it at 2 clicks in from full fast.

<table>
<thead>
<tr>
<th>Body weight (LBS)</th>
<th>Air pressure (PSI)</th>
<th>Body weight (KG)</th>
<th>Air pressure (ATM)</th>
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</tr>
<tr>
<td>170</td>
<td>114</td>
<td>80</td>
<td>8.2</td>
</tr>
</tbody>
</table>
This suspension system connects the swingarm to the mainframe with a long rocker linkage (Figure 3.12.2).

**Inspection**

**After every 10 hours of use** inspect the shock mounting bolts and the pivot bolts for tightness. Remove the nut from the bolt or axle, clean the threads thoroughly, and apply a thread-locking compound (Loctite 242 is excellent). Tighten the bolts to these torques:
- Shock mounting bolts: 125-200 lb•in (14.1-22.6 Nm)
- Pivot bolts: 125-200 lb•in (14.1-22.6 Nm)
- Linkage bolts: 125-200 lb•in (14.1-22.6 Nm).

**Once a month** check for bearing wear. Place one hand on top of the rear tire, and grasp the seatpost with the other. Try to move the rear wheel from side to side, and the seatpost up and down. If you feel any looseness, take the bike to your Trek dealer for service.

**Adjustment**

Your shock owner's manual tells you how to adjust the rear shock for most bike designs. This information makes tuning suggestions specifically for the Liquid.

For an all-round ride, set the forks for about 15% sag (19mm), and the rear shock at about 1/8 inch (12mm) sag. If your riding is slower or more technical, you may want slightly more sag. If you ride really fast, or on smoother terrain, you may like less. Find the correct pressures for the starting sag in the chart below, then try increments of 5 to 10PSI (0.25 to 0.5ATM). If the shock has damping adjustment, set it at 2 clicks in from full fast.

<table>
<thead>
<tr>
<th>Body weight (LBS)</th>
<th>Air pressure (PSI)</th>
<th>Body weight (KG)</th>
<th>Air pressure (ATM)</th>
<th>Body weight (LBS)</th>
<th>Air pressure (PSI)</th>
<th>Body weight (KG)</th>
<th>Air pressure (ATM)</th>
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<td>110</td>
<td>16.7</td>
</tr>
</tbody>
</table>
On the Y bike, the swingarm is attached directly to the shock and main frame, and the crankset is on the swingarm.

**Inspection**

*After every 10 hours of use* inspect the shock mounting bolts and the pivot bolts for tightness. Remove the nut from the bolt or axle, clean the threads thoroughly, and apply a thread-locking compound (Loctite 242 is excellent). Tighten the bolts to these torques:

- Shock mounting bolts: 61-75 lb·in (6.9-8.5 Nm)
- Pivot bolts: 100-110 lb·in (11.3-12.4 Nm).
- Linkage attachment bolts: 15-20 lb·in (1.7-2.2 Nm).

*Once a month* check for bearing wear. Place one hand on top of the rear tire, and grasp the seatpost with the other. Try to move the rear wheel from side to side, and the seatpost up and down. If you feel any looseness, take the bike to your Trek dealer for service.

**Adjustment**

To increase the preload (decrease the sag) on coil/over shocks (Figure 3.12.3), rotate the adjustment nut to compress the spring. To make the suspension softer, rotate the nut to lengthen the spring. If the spring on your shock does not offer the desired range of adjustment, replacement springs are available with different spring rates. See your Trek dealer.

When adjusting the seat height on your Trek Y bike, do not lower the bottom of the seat post to any position closer than 1.5" (38 mm) to the top of the swingarm. Allowing the swingarm to contact the seat post could damage your bicycle.
With this suspension design, the swingarm is attached to the mainframe and a long rocker linkage

**Inspection**

*After every 10 hours of use* inspect the shock mounting bolts and the pivot bolts for tightness. Remove the nut from the bolt or axle, clean the threads thoroughly, and apply a thread-locking compound (Loctite 242 is excellent). Tighten the bolts to these torques:

- Shock mounting bolts: 125-200 lb•in (14.1-22.6 Nm)
- Pivot bolts: 125-200 lb•in (14.1-22.6 Nm)
- Linkage bolts: 125-200 lb•in (14.1-22.6 Nm).

*Once a month* check for bearing wear. Place one hand on top of the rear tire, and grasp the seatpost with the other. Try to move the rear wheel from side to side, and the seatpost up and down. If you feel any looseness, take the bike to your Trek dealer for service.

**Adjustment**

To get the most from your new Diesel, the suspension must be set up correctly. As a starting point we recommend setting the forks for about 15% sag (20-30mm), and the rear shock at about 25% sag (17mm, measured on the shock). This will provide a good, all-round ride. If your riding is slower or more technical, you may want a softer setup. If you ride really fast, or on smoother terrain, you may like the Diesel set up a bit firmer. Set the damping adjustment according to your anticipated speed, with more damping as the speed increases.
Trek bicycle frames are constructed from a variety of high performance materials. For safe operation, and long life, take care of your bike frame by following these instructions.

**Inspection**

**Before every ride** carefully inspect your frameset (frame and fork) for signs of fatigue. Scratches, cracks, dents, deformation, or discoloration are signs of stress-caused fatigue. If any part shows signs of damage or fatigue, replace the part before riding the bicycle.

**Frame information- all frames**

Trek framesets use three sizes of seat lugs designed to accept seat posts with 27.12 to 27.20 mm, 29.12 to 29.2 mm, or 31.45 to 31.60 mm outer diameter. According to the specifications for your frame, the seatpost should be measured for conformity to this tolerance prior to installation.

For aluminum or steel frames, lubricate the seatpost to prevent seizing in the frame. Do not lubricate a seatpost in an OCLV frame; inside the seat lug of OCLV carbon frames, a thin layer of fiberglass acts as an insulator to prevent corrosion.

The aluminum or OCLV carbon fiber composite parts of your bicycle, both frame tubes and parts like rockers or dropouts, are not as ductile as steel. Attempting to make adjustments to an aluminum or OCLV part by bending or twisting it poses a risk of breaking it. Readjustment of aluminum or OCLV frame alignment is not recommended.

Tolerances for press fits and thread fits are critical. Pressing a part which is too large, or misaligned, may break the frame or part. Over-torquing a threaded fastener may ruin the threads or break the part. Be sure bottom bracket and rear derailleur threads are clean and well greased before insertion. Start threads by hand, not with a wrench. Torque specifications for bottom bracket cup threads is 430-610 lb•in (48.6-68.9 Nm). Torque specifications for rear derailleur threads is 70-85

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**WARNING**

Never modify your frameset or parts in any way, including sanding, drilling, filing, removing redundant retention devices, installing incompatible forks, or by any other method. An improperly modified frame, fork, or component can cause you to lose control and fall.
When cleaning frame parts, do not use solvents or harsh chemicals. Remove road film with a soft rag and a mild detergent and water solution. Use of industrial solvents for cleaning or paint removal may damage the paint.

Removing paint from any frameset requires special techniques and great care. Harsh abrasives will remove frame material, possibly weakening the bicycle. See your Trek dealer for more information.

Excessive heat, such as that used in powder coating, or any open flame, may damage the adhesive which joins the frame parts. Do not exceed 180° F. (82° C.) exposure to your frame.

Modifying the frame in any way will void the warranty and may be unsafe.

Changing the forks on your bicycle could alter the steering of the bicycle, or create undesirable stress loads on the frame. Suspension forks may add stress to a bike frame. Never add a suspension fork to a road bike, or change style and/or length of forks. If you must replace the fork on any bike, check with your dealer or the Trek Bicycles technical service department to ensure that the new forks are compatible with the frame.

Special OCLV road frame and fork requirements

Trek OCLV road frames must always be fitted with a chainstay guard (Figure 3.13.1) and a chainkeeper (Figure 3.13.2) to protect against damage in case of chainsuck or overshifting past the inner chainring. Make sure the chainkeeper and chainstay guard pieces are installed correctly and maintained in good condition at all times. Should they become dislodged or damaged, see your Trek dealer to have new ones installed right away.

Bontrager carbon composite forks are not compatible with any mechanism which clamps around the fork blade, with the exception of bicycle computer sensors. Do not use mechanical fasteners to attach any other parts to this fork. If you are unsure of what items can be attached to this fork, consult your Bontrager dealer.

Special frame features

Some Trek bikes feature an Accessory Port (Figure 3.13.3), an
unique attachment point which allows you to use custom accessories. Among these accessories are trailers, racks, and more. See your Trek dealer for details.

**Frame Repair**

Most types of frame damage may be repaired at the Trek factory. You must send your frame back to Trek through an authorized Trek dealer.

![Universal attachment](image)
Some models of Trek bikes have a large hinge in the middle (Figure 3.14.1) that allows folding of the bike for storage or transportation. These instructions explain how to fold and unfold a folding bike.

**Avoid pinching in folding mechanisms**
When operating folding mechanisms, keep fingers and other body parts out from items which are folded. Also keep cables and housing from being pinched, as this can damage the cables.

### Inspection
Before every ride, make sure the frame latch, lower stem quick-release, and other quick-release mechanisms are properly adjusted and closed. Check that the frame latch is closed and the frame has become a rigid structure by attempting to move the center of the frame laterally, from side to side. If there is any motion, take your bike to your dealer for service.

### Folding and unfolding the bike
Folding is done without tools, and takes only a minute. Before starting, make sure you are familiar with the proper operation of a quick-release. Pages 6 and 7 explain this procedure for operating the quick-release for wheels, a similar mechanism.

#### To lower the saddle
1. Open the seatpost quick-release and lower the saddle to its lowest position.
2. Close the quick-release to hold the seatpost in position (the seat makes an excellent handle).

#### To fold the pedals
1. Push the end of the pedal directly inward, toward the crankset.
2. Fold the pedal over.
3. Repeat for the other pedal.
To fold the handlebar stem
1. Rotate the lever lock (3.14.3) away from the lower quick-release.
3. While holding the handlebar to prevent pinching, hold the cables out of the way, and open the lower quick-release (Figure 3.14.3).
4. Fold the handlebar assembly to its down position (Figure 3.14.4).

To fold the main frame
1. Open the latch lock.
2. Pull outwards, away from the frame, on the end of the frame latch until the latch opens.
3. While avoiding pinching yourself or cables, fold the bike in half (Figure 3.14.5).

To unfold the frame
1. Reverse the steps of the folding procedure.

Adjustment
After unfolding the bike, if the frame or the stem is not rigid, the frame latch or lower stem quick-release may need adjustment. If there is any motion at a latched and locked frame hinge or stem, take your bike to your dealer for service.

WARNING
Riding a folding bike with movement at the lower stem quick-release or main frame hinge could cause you to lose control and fall. If the folding frame moves at the stem or frame hinge, take the bike to your Trek dealer for service.
Introduction

To enhance their capacity for commuting, trekking bicycles are equipped with a selection of accessories which may include a generator light set (Figure 3.15.1) for improved visibility, fenders to keep the bike and rider drier, a rack to carry belongings, or a bell to sound warnings or greetings. All accessories must be properly maintained for best service.

Inspection

Once a month check to ensure the following nuts and bolts are tight:
- Fender adjusting nuts: 30-40 lb•in (3.5-4.5 Nm).
- Fender and rack bolts: 50-60 lb•in (5.7-6.8 Nm).

If your bike is equipped with other accessories they should also be inspected monthly.

Lights

The lights on your Trekking bike have been designed and installed on your bike for extra safety in conditions with poor visibility resulting from either fog or dark. These lights are powered by a generator so no batteries are required. However, for your lights to provide light the generator must be properly installed, adjusted, and engaged in the ON position, with your bicycle rolling with enough speed to illuminate the light bulbs, usually about 3-4 miles per hour.

WARNING

When the bike is not moving, the generator will not provide the power needed to illuminate the light bulbs of the lights, causing you to be less visible to other traffic. Use a back-up battery light source, or only stop in brightly lit areas where you are out of the traffic flow.

To turn on your generator and thus your lights, press down on the generator body as shown in Figure 92. This will engage the generator and the lights will come on as soon as your bike is rolling. You should visually check that both the headlight and taillight are illuminated as you start to ride. To turn off your lights, rotate the generator body away from its contact with the tire until you hear a click. If you have done this correctly, the generator should stay in the OFF position.
Check your lights. For best results, the lights should be carefully aimed to provide the best blend of brightness and distance for your style of riding, as well as the best location in front of your bike (generally centered directly in front of the bike). The lenses of the lights should be kept clean. Remember that your field of vision may be diminished when riding at night, even with the headlight on. You should adapt your riding speed for safety. Also remember that although you have your lights on, you will be less visible than during daytime riding. Always ride defensively!

In addition to aiming the lights on your bike and keeping the lenses clean for maximum illumination, you may have to replace the light bulbs occasionally. It is recommended that you do this every six months because no warning will precede the burning out of a light bulb. By replacing the bulbs periodically you will reduce the risk of a bulb burning out during use of the light which would leave you without a functioning light.

The wiring on your trekking bike lighting system may be partially enclosed inside the frameset to protect the wires. Avoid pulling, tearing, or cutting these wires, as damaging the wires will cause the light to cease to function.

**Installation**

The correct bulbs can be purchased from your Trek dealer. The bulb has its volts and wattage listed on its base. The most commonly used bulbs are:

- Headlight- 6V 2.4w
- Taillight- 6V 0.6w

**To install a light bulb**

1. Locate the lens set-screw on the back of either the taillight or head light (Figure 3.15.2).
2. Remove the screw with a Phillips screwdriver.
3. Rotate the lens 1/4 turn clockwise and lift the lens assembly off the bulb mount.
   
   *You may then unscrew the bulb, being careful not to crush the glass of the bulb.*
4. Being careful not to dislodge the wire in the base of the bulb mount, screw a new bulb in until finger tight.
5. Place the lens on the bulb mount, rotate the lens 1/4 turn counter-clockwise.
6. Install the lens set-screw with a Phillips screwdriver.

Check to make sure the new bulb works. If it does not, check the wiring for correct placement. If the light still does not work, verify that the new bulb is not damaged.
TREK BICYCLE CORPORATION
LIMITED WARRANTY

Trek Bicycle Corporation warrants each new Trek bicycle frame and rigid fork against defects in workmanship and materials for the lifetime of the original owner. Trek Bicycle Corporation likewise warrants all original parts, excluding suspension forks and rear shock absorbers, for a period of one year from the date of purchase. Suspension forks and rear shock absorbers shall be covered by the stated warranty of their original manufacturers. Paint and decals are warranted for one year. This warranty is expressly limited to the repair or replacement of a defective frame, fork, or defective part and is the sole remedy of the warranty. This warranty applies only to the original owner and is not transferable.

Claims under this warranty must be made through an authorized Trek dealer. Proof of purchase is required. A warranty registration card must be completed and received by Trek Bicycle Corporation before a warranty claim may be processed.

The warranty does not cover normal wear and tear, improper assembly or follow-up maintenance, or installation of parts or accessories not originally intended or compatible with the bicycle as sold.

The warranty does not apply to damage or failure due to accident, misuse, abuse, or neglect. Modification of the frame or components shall void this warranty.

Trek Bicycle Corporation shall not be responsible for incidental or consequential damages. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you. Labor charges for parts changeovers are not covered by the warranty.

This warranty gives the consumer specific legal rights, and those rights may vary from place to place. This warranty does not effect the statutory rights of the consumer.