

# basics of bicycle maintenance

2014



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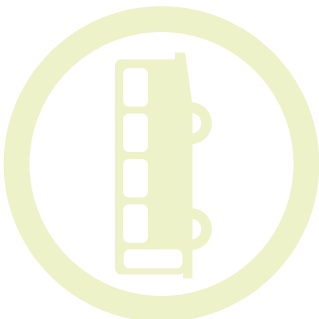
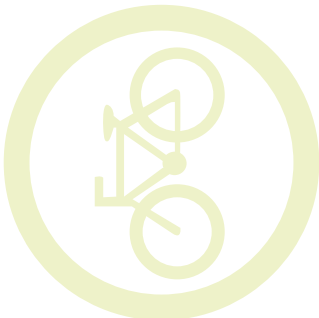
## The basics of bicycle maintenance

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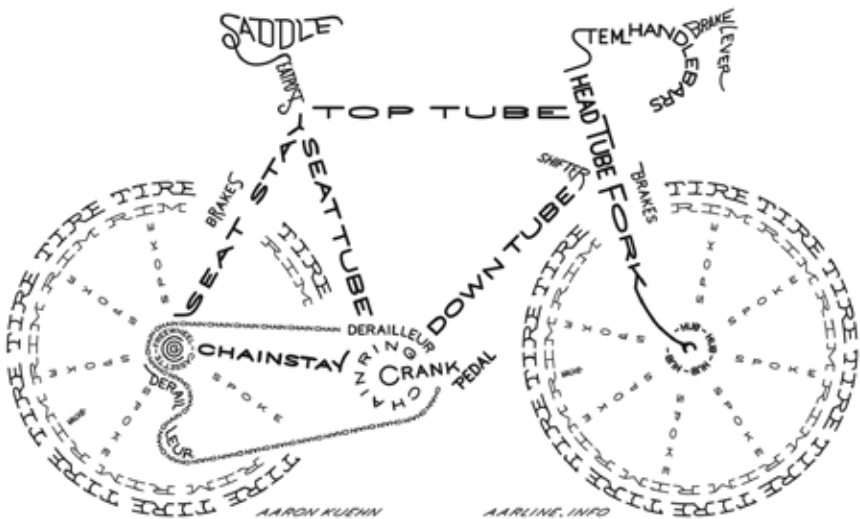
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## the basics

**Did you know?** On a round-trip commute of 16 kilometres, bicyclists save around \$10 daily... Adults who bike to work have better weight, blood pressure, and insulin levels... In a 2011 community survey, Kelowna Bike commuters reported lower stress and greater feelings of happiness, relaxation, and excitement than car commuters.

## overview: bicycle components & terminology



### **Bicycle Typogram by Aaron Kuehn**

Please see <http://aarline.info/hotaar/?p=1> for more details and a downloadable PDF.

# ensuring your bike is safe to ride

## Frame

Inspect all tubes for dents, bends, kinks or cracks. Never ride a bike with a damaged frame! Full suspension frames require further inspection of moving pivots and the shock. Check for oil leaks on shocks or poor performance (unresponsive, stiff, etc). Have your frame and/or shock professionally serviced if problems are found.



## Front fork

Inspect the front fork to ensure it is straight, free of dents, cracks or bends and that it is properly fixed to the bicycle. The fork should turn freely in the headset (the bearing system that attaches the frame to the fork), but should not have play between the fork and bike frame. Suspension forks require regular professional servicing in order to function optimally. Inspect suspension forks for leaks and upper leg scuffs regularly. Have your fork serviced if it leaks or is performing poorly.

## Handlebars, Stem, Seat and Post

Your handlebar and stem (part that fixes the bar to the bike) should be in line with your front wheel and all bolts should be tight. Holding your front wheel between your legs, try turning your bar and stem. They should not move. Grips should be tight, in good condition and have handlebar plugs installed. Replace if worn, damaged or missing. Your seat and seatpost should be secure with your seat level to the ground and positioned fore and aft so that you are comfortable. See 'The importance of bike

fit' at the end of this guide to help you fine tune your bike fit to ensure a comfortable ride.

## Wheels/tires

Tires should be inflated to the specification noted on the sidewall and should be checked monthly. Tire casing and tread should not have any cracks or cuts. Rims should be free of dents, bends or flat spots and spokes should be evenly tensioned. Hubs (axle assembly) should spin freely without any play. Damaged wheels or tires can be dangerous. Replace or repair damaged wheel components or tires immediately.

## Brakes (front & rear)

**Brake levers should activate the brakes smoothly and firmly well before the lever reaches the handlebar.** Cables should be taut, have no breaks or frayed ends. Hydraulic brake equipped bikes should not have any leaks and should have a firm lever feel. Brake pads should be regularly inspected for wear and replaced as required. Pads should be properly aligned and secured, and brakes should be aligned so that they do not rub on the rim or rotor (disk brake equipped bikes). Finally, brakes should be tested to ensure they effectively stop the bike with little force. Poorly performing brakes should be repaired immediately by a qualified bicycle technician.

Bicycle components should be regularly inspected for wear and tear. It is important to remember that your bike should receive at least one professional tune up and inspection each year by a professional bike shop. Do not perform repairs to your bike that you are not experienced or comfortable with. A properly functioning bike is not only safe, it's a lot more fun to ride!

## Crank & pedals

The crankset (the bike's front chain wheel) should turn freely and evenly, when spun. They should not feel like they are binding, and should have no bends or cracks. Chain rings should not be bent or have any missing teeth and should be inspected regularly for

wear associated with increased mileage (pointed teeth are a sign of extreme wear). Pedals should turn freely and cages should be in good condition with no cracks or bends. Damaged components should be replaced immediately. Worn chain rings indicate a fully worn drivetrain (rings, chain, rear cog/cassette).

## Chain

The chain should be free of rust, not over oiled and inspected for wear regularly. Chains stretch over time and require replacement. Catching this in time can save you money on other more costly drivetrain components (chain rings, cogs/cassette). Your local bike shop can check the rate of chain stretch or purchase your own gauge. Chains should be lightly oiled as needed using a bicycle specific lubricant. Be sure that oil does not come into contact with your brake components!

## Derailleurs/shifters

Both front and rear derailleurs should be inspected to ensure they are not bent, cracked or seized. When shifting becomes erratic or rough the cause may be derailleur damage, cable/housing damage or stretching, lack of lubrication or drivetrain wear and tear. Inspect all related components. ***Your derailleurs and shifters should operate smoothly and shifts should be crisp and accurate.*** Regular lubrication of pivot points and shifter internals help to maintain top performance.

## Quick Releases

Bikes equipped with quick release wheels or seat posts require regular inspection. Ensure all levers open and close smoothly and that they are closed tight. Quick release levers are a cam system and consist of a nut on one end and lever on the other. When the lever is opened the tension that is holding your wheel or seat post is released. In closing the quick release properly you tighten the nut side slightly but not fully. You will know you have the correct setting on the nut when the lever, as it's closed, begins to feel tight about a

**TIP:** For removing the rear wheel, shift bike to the lowest rear gear first. This allows the wheel to slide out of the frame past the rear derailleur easier.

third of the way through its stroke. When tension is set properly the lever should begin to feel difficult to push closed over the last third of its stroke. It should leave an imprint on your palm when closing it. When you close the skewer, your hand strength is accomplishing two things: It's applying a clamping force to the skewer, and it's overcoming the mechanical friction of the mechanism.

## Accessories

All accessories on your bike should be properly fixed to the bike and should be functioning. Test kickstands, light systems, bottle cages, fender sets, rack and bag systems, etcetera to ensure all are functioning properly and are not impeding safe operation of the bicycle.

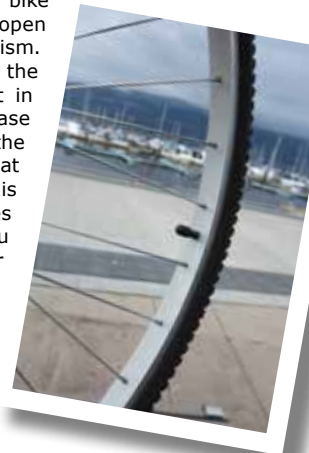
## Repairing a flat tire

### Be prepared to change a flat!

During a ride you'll require some basic tools and some before hand knowledge and practice of the procedure. You'll require the following tools: tire lever set (3), spare tube and/or patch kit, tire pump, cell phone or bus pass (optional/last resort tools!)

**STEP 1:** Inspect the damage. Can you see what cause the flat? Was it road debris like glass, etc? A pinch flat from hitting a square edge sharply? If there is obvious significant tire damage it may be time to use that phone and call for help or find your nearest bus stop!

**STEP 2:** Remove the wheel -- practice this at home before you need this skill! On rim brake equipped bike you will first need to open your brake mechanism. This requires pulling the cable through a slot in the brake arm to release the arms away from the wheel (take a look at your bike and try this at home as it varies by brake type). If you intend to patch your punctured tube, you may be able to do so without removing the entire wheel but rather following the steps below to



remove one side of the tire only to allow the tube to be exposed for repair.

STEP 3: Release the air if the tire is not fully flat (you may need to do this before you remove the wheel) as it helps to freely remove the wheel from the bike (and from your brake if you can't open it easily).

"Of all the bike maintenance skills I've acquired over the years, repairing a flat tire has been the one I've gotten to practice the most!"

Mike Kittmer, Active Transportation Coordinator

STEP 4: Insert the thin spoon end of your tire lever between the tire bead (edge) and the rim, pull down and clip the hooked end of the lever to the nearest spoke. Move over a couple spokes and repeat this procedure with your second tire lever and then again with the third if the bead is still tight. Remove the first lever and use the spoon end to 'scoop' the bead off of the rim until it is free enough to slide the lever around the tire to remove the remainder of the bead. Once one side is fully free you can then pull the other side up and over the rim edge and off of the wheel (you may not need to take the entire tire off to change or repair the tube as you only require one side to be off the rim to access the tube. Careful if you have disk brakes! Remove the tire from the rim on the non-disk side of your wheel. **Do not pull a tire off with force on the disk side, if you slip you can be seriously injured!**

STEP 5: Remove the tube by pulling the old tube out of the tire with your hands. Save old tubes to patch them at home for future use, or to recycle at your local bike shop. Run your hand lightly over the inside of the tire to find the cause of the flat. Remove any thorns, glass, wire, etc. If you now find a large hole in the tire, now is a good time to use that cell phone or bus pass! Alternately, consider a temporary tire boot, like a patch, to cover the hole. Any heavy cloth material, tape, cardboard or even bills (yes money) can serve as a tire boot to cover the hole and ensure your tube will not protrude through. If you boot your tire, be sure to be careful re-inflating the tire possibly keeping the pressure lower. Ride slower and cautiously to your destination and replace or properly repair the tire before reuse.

With your pump put one or two strokes of air into your new tube to shape it then place it into the tire. There are two common valve types on tubes, Schrader or 'American' valve (like those found on vehicles) and Presta or 'french valve' commonly found on road bikes. Presta valves are narrower and include a locking threaded tip. Most modern bike pumps will accommodate both valve types. Ensure your spare tube is the correct size and valve type for your bike.

STEP 6: Insert the tube valve through the valve hole in the rim ensuring it is 90 degrees to the rim, not angled. Pull the tire over the rim, working one side at a time. It is best to work the bead over the rim evenly around starting opposite the valve. If you removed the entire tire, move to the other side again working the tire bead on evenly ending by the valve. The last few inches will be tight but can be done by hand. Try to avoid using tools so you don't pinch the tube! You can now re-inflate the tire to the recommended PSI noted on the sidewall (or lower if booted). As you pump it up, watch to ensure the tire bead is seating evenly on the rim. You may need to manipulate the tire edge as you go to get an even seal. You may opt to pump up the tire once it's re-installed on the bike if your tire is large and difficult to get into your frame or through your brake arms.

STEP 7: Re-install the wheel onto your bike. Reconnect brakes if opened to remove wheel. Spin wheel to ensure it's installed evenly and doesn't rub brakes or the frame or fork. Test brake and ensure pads are hitting rim squarely (rim brakes only). Shift into an appropriate gear, put away your tools and get back on your way!



## basic bike maintenance

It is advisable to take your bike to an experienced mechanic once a year for a thorough service. However, with a little investment in tools and time, the majority of repair and maintenance jobs can be carried out at home.

### Basic repair tools

There is a range of bicycle tools available, however all you need to start with are screwdrivers, Allen keys (metric), wrenches (also metric), a pump, tire levers, cleaning rags an old scrub brush, lubricants and a puncture repair kit. ***If you plan to do your own work regularly, consider purchasing a bicycle repair stand to make servicing your bike easier.***

### Daily bike maintenance

Each day you use your bike you should give it a quick once-over. In particular, check the condition of the tires and their pressure and have a look at your chain lubrication.

### Weekly bike maintenance

Clean then lubricate exposed moving parts of the bike, such as the chain and derailleur pivots taking care not to get any on wheel rims or brakes. Clean dirt / grease off wheels with a cloth and some cleaning spray, test lights for brightness, grab components/parts to see if anything is loose.

### Monthly bike maintenance

You should conduct a full bike inspection each month. Check tire pressure and condition of tread and sidewalls. Make sure your wheels are properly fastened, are in line with the frame and spin freely and straight. Check all nuts and bolts to insure they are tight. Wash down your bike with soap and water (never use a pressure washer) and re-lubricate all moving parts and cables. Run t h r o u g h shifting to ensure its functioning well and cables are

Taking your bike in for a professional tune up or to have more advanced repairs performed will ensure your bike runs at its best and offers you years of faithful service.

smooth. Inspect brake pads for wear and test brakes ensuring they engage effectively. Replace worn/frayed cables or damaged cable housings. Ensure all bearing systems (hubs, headset, pedals, cranks) spin smoothly and have no excess play. Inspect suspension components (if equipped) for leaks or damage. Inspect your frame for any damage.

### Annual service

Bicycle technicians are trained to repair all types of bicycle components from shifting systems to suspension. Don't take chances, if you unsure about how to repair something on your bike take it to the pros!

## ADVANCED REPAIRS

Advanced repairs to bicycle systems require mechanical aptitude and often bicycle specific tools. Do not perform repairs you are not comfortable with and always use the correct tools and replacement components! The purpose of this guide is simply to provide you with a better understanding of two of your bike's major systems, shifting and braking. For detailed servicing guidance for these or other bicycle systems such as wheels, bearing systems or suspension, consult your local bike shop or the manufacturer of specific components.



## shifting systems

### Getting started

In order to make shifting system adjustments you will need a way to suspend or hold the bike upright (a car rack works or use a repair stand, if you have one). You'll need a 5-mm allen wrench, chain lube, grease, diagonal cutters, pliers, small screwdriver (flat or Phillips) and cable end cap (to prevent fraying). This tutorial will guide you through a front and rear derailleur tune and changing or cleaning of cables and housings.

Place the bike in a repair stand. While pedaling by hand, shift the chain to the smallest freewheel cog and middle or smallest chain ring.

### Cleaning or changing cables or housing

Cut off the end cap, loosen the anchor bolt, and pull the cable out of the clamp. If it's kinked or rusted, replace it. If it's ok, simply clean the full length of the cable with an oiled rag. Blow out housing sections then using your chain lube, lubricate into housing. Using a synthetic bicycle grease, grease housing end under caps then reroute the cable through the housing and to the anchor bolt. Turn the derailleur adjustment barrel, located on the derailleur body, clockwise all the way (last piece the cable goes through before it reaches the anchor bolt on the derailleur), then unscrew it one turn. Don't tighten the anchor bolt yet.

### Tuning the front and rear derailleurs

To test the rear derailleur while pedaling, with your right hand, push against the derailleur body with your left thumb causing a shift to the largest cog. Release the pressure with your thumb to shift to the smallest cog. Do this repeatedly, noting any hesitation or over shifting. The chain should move smoothly onto the smallest and largest cogs. If it does not, then adjustments need to be made to the limit screws on the derailleur that prevent it from over or under shifting past the outer and inner most cogs. **Take your bike to**

***a professional mechanic if you're not familiar with adjusting limit screws! Incorrect adjustment can result in rider injury and component damage.***

If you are familiar with making limit adjustments, the derailleur range of motion can be altered by turning the high and low-gear limit screws found on the derailleur body (usually the top and bottom, respectively on the rear derailleur) to allow the derailleur to shift accurately to the largest and smallest cogs. Counter clockwise turns allow it to move farther; clockwise turns limit it. Keep shifting with your thumb and fine-tuning the screws until the chain shifts perfectly onto each cog with no hesitation or over shifting range.

Front derailleurs offer similar adjustability allowing you to set the mechanism so that it will not allow the chain to drop off over the top or bottom front chain ring. In order

**Remember! When riding you should never 'cross chain'. Cross chaining is when you are using the inner or outer most front cog and the opposite rear gearing. Your chain is at an extreme angle in these cases which will result in poor shifting performance, worn parts and possible miss shifts or drivetrain skipping which can result in injury!**

to effectively test the function of the front derailleur you'll need to first attach the cable to the anchor bolt then run some test shifts while pedaling the bike with your opposite hand. With the chain on the smallest cog, grasp the cable with pliers and pull lightly to remove slack. While holding the cable, tighten the anchor bolt. Install the cable end cap

and crimp it in place you're your cutters. While pedaling, with your opposite hand, shift repeatedly with your other hand to test adjustments. The chain should engage the largest and smallest cogs accurately. If necessary, adjust the limit screws found on the top of the derailleur (ensure you're using the screw that corresponds with the inner or outer limit you are setting!). Often cables stretch initially so after a few shifts you may need to re-tension the cable at the anchor.

If the chain won't drop down smoothly through the gears you may need to loosen the cable by turning the adjustment barrel clockwise half a turn. Conversely if shifting is hesitant moving up the gears you may need to add tension to the cable using the



barrel adjuster. **Barrel adjuster allows you to 'fine tune' your shifting.** Standing behind the bike you should be able to see the rear derailleur move up or down slightly as you make minor barrel adjuster movements. The two jockey wheels in the derailleur should always center over the gear you are in. Running through each gear individually, test to ensure all shifts are smooth and crisp.

A properly adjusted front derailleur should result in smooth, fast up or down shifts and no chain rub on the derailleur cage except possibly when the rear derailleur is in the extreme highest or lowest cogs.

Most shifters also have a fine tuning barrel adjuster where the cable enters the shifter. This can be used to make 'on the fly' minor shifting adjustments if shifts are hesitant. Tensioning the cable (dialing the adjuster out) will help the rear shifter climb up to lower gears while de-tensioning the adjuster (dialing it in) will allow it to drop to higher gears more easily. Just to be confusing, on most system it is the opposite for your front shifter/derailleur!

## brake systems

There are many brake types on modern bikes including caliper, V-brake, coaster and disk brakes. All have unique maintenance needs. For the purposes of this guide, we'll touch on only a few key points. Remember,

Your safety depends on a functioning brake system on your bikes, don't take chances.

your local bike shop is your resource when it comes to repairing today's complex braking systems.

### Fine tuning between major services

On mechanical (cable actuated) brake systems interim brake adjustments can be made using your brake system's barrel adjusters. This is the device located commonly on your brake lever (on the brake caliper on road bikes). The adjuster allows to you add tension to your cables (like tightening a guitar string) in order to take up slack that has developed as your brake pads wear. To use barrel adjusters, turn them counter clockwise by hand and check the setting by squeezing the levers. When



the brakes feel right, lock the barrel adjusters in position by turning the lock ring (the second knurled piece) clockwise until it's tight against the lever. Over tightening the adjuster will result in brake pad rub. Simply

back off a bit if this occurs. It's important to check your brake pad condition each time an adjustment is needed. You may find your pads are worn right down and need replacement. Barrel adjusters should never be run out near their full length.

### Brake pads

If pads are due for replacement you'll need to bring them into your local shop to ensure you're getting the correct replacement pad. All brake systems vary in the type of pad used so we will not go into detail as to how to change pads as the process differs with each system. It is recommended you have a local shop replace worn pads and re-tune your brake system when required. In doing so the shop will re-set your barrel adjusters back in, set the pads to contact evenly to the rim or disk, ensure there is no rubbing and that your brake levers engage well before they reach the handlebar. For those interested in learning how to change your bikes specific pads, inquire with your shop's mechanic.

### Hydraulic disk brakes

Hydraulic disk brake systems require re-bleeding just like car brakes from time to time. Consult your local bike shop or owners manual for service intervals. Have a shop perform fluid replacement to ensure it's done correctly. Brake fluid is often corrosive to painted surfaces and is harmful to health if exposed. Fluids should always be disposed of properly at facilities that accept such materials. Check with your local bike shop to ensure proper disposal.



## Brake cables and housing

Frayed or damaged cables can be replaced or mechanically actuated brake systems by unbolting the cable anchor located on the brake arm, cutting off the old cable end cap (if present) and sliding the cable out of the housing system. The brake cable has a circular end that allows it to sit within a fitting within the brake lever to anchor it the lever. You will need to turn your barrel adjuster and locking nut to so that the slot within each aligns allowing the cable to route out through the adjuster and then out of the lever fitting. Place the new cable anchor into the lever fitting so it is secure then route the cable back through the barrel adjusters remembering to re-tighten the adjuster (leave about one full turn or so from fully tight for fine tuning adjustments). Run the cable through the lubricated or new housing system the re-attached the cable end to the brake arm anchor. When doing so, leave approximately 2mm of space between the pads and your rim (approx. 1mm or less between disk brake pads and the rotor). Cut off the excess cable (leave about 2" max) and clamp a cable end cap to the cable using your cutters. Test the brake, it should engage evenly well before the brake lever reaches the bar. Pads should not rub at all when the brake is disengaged. Make adjustments to the cable tension as required until a uniform feel is achieved.

## Properly aligned brakes

One of the most common brake problems is a dragging brake pad; one that remains against the rim or stays close to it after you've released the brake lever. **The most common cause of rubbing breaks is a misaligned wheel.** This can occur when you reinstall your wheel after removing it to put your bike on a roof rack or to fix a flat tire, and you don't get it exactly centered in the frame. This causes the brake to work

improperly because it's tight on the frame and has been adjusted to align properly only on a perfectly centered wheel. Now that the wheel is crooked in the frame, the brake can't work correctly. To correct the dragging brake pad, simply center the wheel in the fork or frame. For most wheels, all that's usually required is loosening, making sure they're fully inserted in the fork or frame, and tightening them. (If the bike is standing, just press down on the handlebars for the front wheel and the seat for the rear wheel to push them fully into the frame and center them.)

If your wheels are centered and the brake still drags, the brake may have gotten bumped and knocked out of position on the frame. Start by double-checking that the wheel is centered in the frame -- you don't want to ruin the brake adjustment if it's actually set correctly. To center side pull brakes (road bikes), loosen the attaching bolt behind the fork crown or brake bridge until the brake is loose. (It should move sideways when you push it). Now, squeeze the lever to hold the brake pads against the rim while you tighten the brake bolt on the back of the frame. If the brake needs minor fine-tuning after this, look for a small screw (it might be an Allen type) on top of the brake. Clockwise turns will move the brake shoe on the side of the screw away from the rim and vice versa. (This screw is not intended for major adjustments.)

To center linear-pull brakes like caliper or V-brakes, look for a small screw in the side of the brake arm. Turning the screw clockwise will move the arm with the screw away from the rim and vice versa. This adjustment affects both brake arms and allows you to center the brake evenly so both pads contact the rim at the same time. Mechanical disk brake systems commonly have pad position adjuster located on the sides of the caliper that allow you to dial in the contact point for the pads ensuring they touch the rotor at the same time. The entire caliper can also be loosened from its two fixing bolts and centered manually. Again, only make adjustments you are comfortable with! Do not adjust brakes if you are at all unsure of the process! Your safety depends on properly adjusted brakes -- if you're unsure, take it to your local bike shop for professional serving.

## Brakes that stick or bind

If your brakes are binding or sticking at all, it may be that they simply need some lubrication on the cables and within the housing system or your pads may need replaced (if they are grooved and sticking against the rim). Cable systems can be lubricated by opening the brake system (freeing the cable from the brake arms or brake lever). If the housing stops are split, open the quick release on side pull brakes or unhook the 90 degree cable guide pipe on linear-pull brakes (v-brakes). This should provide enough slack so that you can pull gently on the housing sections and free them from the frame stops. If you need more slack, squeeze the brake shut with your hand. You can lightly lube into cable housing ends and wipe lubrication onto cable sections that flow through housings to improve braking performance. **Be very careful not to get lubrication onto your brake pads or rims/rotors. Lubrication can ruin pads and seriously impact braking performance.** If you get lube onto your brake components clean it immediately with rubbing alcohol. Exposed disk brakes pads may need to be replaced as they are porous and soak up lubricants easily which ruin the pads. Reconnect the cables and test the brake to see if all binding/sticking is gone.

Brakes should operate smoothly and easily and the brake pads should snap away from the rims when you release the levers.

## Cleaning brake surfaces

For optimum braking, the rims and brake pads must be clean. As you use your brakes, however, the pads strike the rims picking up anything on them and sometimes transferring rubber deposits to the rims. The pads even pick up bits of sand and gravel that then grind the sides of the rims as you brake wearing them prematurely. This is another reason it's important to keep the pads and rims

clean (rim replacement is expensive). To clean them, dampen a corner of a rag with rubbing alcohol and scrub the rims to remove any rubber deposits or grimy build up. Then wipe the surfaces of the brake pads to clean them. Disk brake system requires very little pad or rotor cleaning but both can also be cleaned using rubbing alcohol on a clean rag. Remember that cleaned brakes will require a break in period again so power will be reduced on your first rides after a cleaning.

## the importance of bike fit

A properly fitted bike ensures you're able to ride more efficiently and comfortably and reduces the chance of injury. Bikes come in a range of frame and wheel sizes allowing you to get the fit that's just right for you or your family member.

### What to consider

When straddling the bike top tube, you should have adequate clearance -- typically at least an inch to two for road or commuter hybrid bikes and up to 4 inches for mountain bikes. Seat height should be adjusted to your leg while in the fully downward crank position, you should have a 10 to 15% bend at the knee. This allows for optimum power transfer while keeping you from fully extending your knees or rocking your hips. To achieve the optimum fore and aft riding position, sit on your bike with both feet in the normal position. Level the pedals so they are parallel to the ground. You should have an approximate 90 degree bend in your forward knee. If not move your seat forwards or backwards just enough to create an approximate 90 degree bend.

The other factors that affect your riding position are stem length and bar/stem height. If your stem is too long you will feel stretched out. If it is too short you will feel cramped or too upright. The general rule applied is that while you are in your normal riding position you should not be able to see the front axle of your front wheel, when you look down your handlebar should cover it. To adjust fore/aft fit you may need to purchase a new stem. Stem height is more to do with rider preference, riding style and comfort. If you are commuting or riding downhill trails you would want to be more upright than you would typically be if



on a competition road bike. Performance oriented riders prefer to be lower and more forward over their bars balancing their weight over the bike. Try a position and only make small adjustment each time until you find a position that balances performance and comfort to your liking. Those with back or neck injuries or pain should consider a more upright riding position that places weight over the saddle of the bike, not over the bars. There are great custom handlebar grips available to help fine tune your comfort on the bike. **Remember, a bike that fits you well is comfortable, fun to ride and makes you want to ride more often!** The same applies to kids bikes; don't put your children on improperly fitted bicycles!

In order for you to get the most out of your riding experience it's important that you have a properly fitted bike.

## Lights & other accessories

By law, all bikes sold in North America are required to come equipped with a front and back reflector and two wheel reflectors. If you are commuting it is a good idea to leave those reflectors on your bike and to consider adding powered light system if you may be travelling after dark. There are many types of bicycle lights available, each with advantages and disadvantages. There is no one "best" solution for any rider, and many riders mix and match different technologies to provide the balance that works for them. Systems are available to provide basic illumination to allow you to be seen, while other more advanced system offer strong illumination that will also light the way for you. **Today's modern LED based light systems offer the best balance of affordability, durability, longevity and performance.** Your local bike shop can help you choose a light set that will meet all of your riding needs. A common setup for a commuter might include a removable handlebar mounted front LED light that provides a flashing and steady mode (white light) and a rear seat post or back pack mounted removable LED

light with both flashing and steady modes (red light). Flashing modes are for use in high traffic areas or during dusk hours to help your draw attention to yourself from motorists in the area.

Many commuter cyclists choose to outfit their bikes so that they are prepared to handle a variety of weather conditions and are able to transport personal belongings, groceries, etc on their ride. Often commuter bikes are outfitted with full fenders, a rear utility rack and rear pannier (cargo) bags that are removable. Often bags are equipped with their own rain covers, reflective piping and carrying handles. Other common accessories include a water bottle cage and bottle (stay hydrated!), kickstand and if more utility space is needed, a handlebar mounted bag. As noted in the repair tips above, some common tools and parts are also carried by regular commuters and sport cyclists. These include a spare tube, tire pump, tire levers and a cycling multi tool (and that trusty cell phone just in case). Accessorize your bike to suit your needs and make it more useful for all trips.

## lock it or lose it!

Bike theft happens. Do what you can to ensure you're not a victim. Purchase and properly use a high quality bike lock when locking your bike in public. U-locks provide the most security. Remember, some bike parts are easily removed such as quick release wheels and seatposts so consider locking through these as well with a separate cable lock. Always lock to a secure feature like a proper bike rack, never to things that can be cut or things that your bike can simply be lifted off of or over. Be courteous and don't block walkways, ramps or doorways with your bike! Keep your bike's serial number and photos of it on file in case of a theft and always report a theft to police right away.

