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## Fix a Flat

By Tom Demerly



All the tools you need to fix a flat (as featured below) [here!](#)

**Step 1: Get off the road away from traffic.**



- Come to a controlled stop on the right of the road away from traffic.
- Change your flat away from the road. Be certain you are clear of traffic.
- Find a spot that is clean, free of mud and allows you to not lose parts if they are dropped.

<b>TIP</b>	<p><b>On a group ride let others know you flatted by raising your arm.</b></p> <p><b>Right arm to signify a rear flat, left arm to signal a front flat.</b></p>
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**Step 2: Open brake quick release, shift to outboard most gear making wheel removal easier.**

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- Stand behind the rear wheel. Open the brake quick release lever by rotating upward.

*This will enable you to remove the wheel by opening the brake pads allowing the tire to pass through without getting caught on the brake pads.*

- Make it easier to remove your rear wheel by shifting to your hardest gear- that is the smallest cog on the gears in the back of your bike.

*This cog is located at the most outboard (farthest right) position from the center of the bike.*

- Once you've shifted down to your smallest size cog located at the outermost position of your gears then pick up your rear wheel and use your other hand to pedal the bike.
- When you pedal the bike it will shift to the smallest cog, sliding the chain downward and outward away from the center of the bike. This will also make re-installing the wheel easier when you are finished.

<b>TIP</b>	<p><b>Technique is everything in flat changing. Take a tip from the pros and stand behind your bike when changing a flat so you can prevent it from tipping over by holding it between your knees.</b></p>
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**Step 3: Open quick release lever and swing derailleur rearward to remove wheel.**



- Open your rear wheel quick release lever. Use your entire hand for leverage.

*Brace the heel of your hand against the center of the quick release skewer. Wrap four fingers around the lever. If your lever is positioned correctly you can pull the lever open.*

*If your quick release lever is aligned with your chain stay it will be impossible to get your hand behind the quick release lever. Remove your helmet and loop part of your chin strap around the lever- then pull the lever open using the chin strap!*

*The best place to position yourself is to kneel on one knee behind your bike, supporting your bike with your shoulder and two hands on the rear wheel quick release skewer and rear derailleur.*

- While you are opening your rear quick release with your left hand, use your right hand to rotate the rear derailleur downward and rearward- toward you. This will open the loop of chain allowing the rear wheel and cogset to pass out of the frame.

*Top view: Rider's perspective. Kneel on one knee behind the bike and open your quick*

<b>TIP</b>	<p><b>If you only touch your derailleur your hands will stay clean- no need to touch your chain!</b></p> <p><b>If you've ever heard the term "dropouts" on a bike frame or fork, this is where that term came from- they enable the wheel to drop out of the frame when used correctly.</b></p>
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*release lever with your left hand as shown.*

- Use your right hand to rotate the rear derailleur back and out of the way. This will allow you to easily remove the rear wheel without getting your hands dirty.

*If you rotate the derailleur correctly back toward you your hands stay clean! No need to touch the chain!*

**Step 3.5: Use proper technique and body position to make wheel removal easier.**



- With the rear derailleur pulled fully to the rear the wheel often simply falls out of the frame once the quick release skewer is opened.

*Some wheels need to be nudged forward and downward to come out. You can gently strike the top of the wheel with your free (left) hand to knock the wheel clear of the dropouts.*

- Now you've got your quick release fully opened, derailleur and chain pulled back out of the way while keeping your hands clean and you tapped the top of your rear wheel with your left hand to knock it downward and free from the bike frame.

*The wheel often simply falls out of the rear triangle of your bike.*

- Using your left hand to hold the left seat stay of your bike frame just below your rear brake, your right hand can grab the rim and guide the rear wheel out of your frame and away from the chain.

*It is necessary to angle the wheel to your left to get your gears out of the loop of chain.*

<b>TIP</b>	<b>Don't be intimidating by the gears and chain when removing your rear wheel. It is more simple than it looks.</b>
	<b>Practice removing your rear wheel before you get a flat tire. After a few attempts at home you will be an expert!</b>

**Step 4: Remove wheel and set bicycle down on left side out of traffic.**



- Now simply pull back and out- your rear wheel is off and your hands are clean!

*Here's another angle on the proper posture, technique and hand placement for removing the rear wheel and holding the bike.*

*This technique enables you to easily control the bike and prevent it from falling over while simultaneously removing the rear wheel.*

*Lay your bike on the left side to prevent leaves and dirt from getting on your chain. Be sure to lay your bike down away of pedestrians, other cyclists and cars.*

<b>TIP</b>	<b>Notice the correct posture: Kneeling behind the bike, left hand on the left seat stay of the bike frame just under the brakes.</b>
	<b>Most of the skills required to change a flat tire easily are a matter of practice and using the correct technique. These are the techniques race team mechanics in the Tour de France use to do rear wheel changes i under 15 seconds.</b>
	<b>The quickest way to fix your flat will be to simply install a new inner tube.</b>

You should also carry a small self-adhesive patch kit to give you the ability to patch a 2nd flat tire in the unlikely event you get two flats in one day.

#### Step 5: Remove and ready your tools for use.



- Everything you need to change a flat can be carried in a compact bag under your saddle.
- Remove your bag and set out the tools and spares you need to change your flat.

*Here we see the spare inner tube, an extra CO2 cartridge, the CO2 filler device and the head for the filler as well as a self-adhesive patch kit and compact multi-tool allen wrench set*

Always keep your flat kit filled and be sure to replenish it after changing a flat tire by putting a new inner tube and CO2 cartridge in the bag.

**TIP** Especially on group rides it is your responsibility to have the necessary equipment to change your own flat tires. It is unfair to other riders to have to mooch inner tubes and tools from them: Be prepared!

#### Step 6: Let any remaining air out of tire to make tire removal easier.



- Let any remaining air out of the tire. This will make removing the tire from the wheel easier.
- Remove your plastic valve cap if you have one.
- Open your Presta valve by unthreading the knurled brass cap. Never remove the brass cap.
- Once the cap is in the open position press the cap inward to allow remaining air to escape.
- Some Presta Valves have a threaded washer on them to prevent it from moving.

*If you have this washer you'll need to remove it before you can take your inner tube out.*

- Unthread the washer and remove it completely.

*Be sure to set it somewhere so you can find it again.*

You don't need to use a plastic valve cap on a presta valve and most new bikes do come with them.

**TIP**

#### Step 7: Remove tire from wheel with a rolling motion using entire hand.





- Begin removing the tire from the opposite side as the valve stem.

*Use your entire hand wrapped around the tire to work the tire off the rim. Older tires will come off easier than newer ones since they have stretched.*

<b>TIP</b>	<b>Another reason to wear cycling gloves is they keep your hands clean and improve grip when removing tires.</b>
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**Step 7.5: Use tire levers if tire is extremely tight.**



- Some tires are a very tight fit. If you cannot roll the tire off the rim with your hands then use one or two tire levers to help pry the tire bead away from the rim.

*Plastic tire levers will not scratch your rims and slide easier against the rim and the tire.*

<b>TIP</b>	<b>Always work away and down from you when using tire levers.</b>
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**Step 8: Remove flat inner tube from tire.**



- Beginning at the opposite side of the wheel as the valve stem remove the flat inner tube from the tire.

<b>TIP</b>	<b>Be sure to set your flat inner tube well away from your new one to avoid confusion!</b>
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**Step 8.5: Pull out valve stem from the rim. Check tire for glass, wire, thorns, etc.**



- Finish removing the inner tube by pulling the valve stem up and out of the rim.
- **IMPORTANT:** Carefully slide your fingers completely around the inside of your tire to check for foreign objects that may have created a puncture; glass, wire, thorns, etc. Remove any foreign objects to prevent additional flats.

<b>TIP</b>	You only need to remove on side of your tire from the rim to change your inner tube.
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**Step 9: Get your new inner tube ready to install.**



- Remove the threaded washer to enable the valve stem to pass through the hole in the rim.
- Put a puff of air into the new inner tube to help the tube maintain its shape and make it easier to install. This also helps prevent pinching.

<b>TIP</b>	To get air into the tube don't forget to open the threaded valve on the inner tube!
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**Step 10: Slide new valve stem through hole in rim.**



- Slide the valve stem downward through the hole in your rim. Be sure your fabric rim strip inside the rim is in the correct position and not damaged.

<b>TIP</b>	You can improvise a new rim strip inside the rim to replace a damaged one by using an energy gel wrapper or dollar bill.
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**Step 11: Begin re-installing your tire at the valve stem. CAUTION: Do not pinch tube.**



- Carefully tuck your inner tube up into the tire and pull the tire over the top of the tube beginning the tire installation.

*Now your primary goal is to get the tube into*

<b>TIP</b>	While you are tucking your new inner tube into your tire you can double check the tire for any sharp objects that may
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*the tire without pinching it. Work carefully around the tire.*

**have caused your flat.**

**Step 11.5: Be sure entire tube is safely tucked inside your tire.**



- Use your finger tips to tuck the inner tube all the way into the tire.

*The farther the inner tube is tucked into the tire the less likely it will be to pinch.*

**Step 12: Begin replacing the tire bead onto the rim. CAUTION: Don't pinch your tube!**



- Begin to roll the tire bead back onto the rim. Use your entire hand to gently roll the tire back onto the tire bead.

*This is often the trickiest step of changing a flat: Your primary goal is to get the new inner tube into the tire without pinching it.*

**TIP** Try your best to put the tire back on without using tire levers. Using tire levers to install your tube almost always pinches the tube causing another flat.

**Step 13: Install the threaded washer.**



- Thread the washer back onto your presta valve stem. Thread it up to the rim and snug it, but don't over tighten.

**TIP** Not all presta valve tubes use a threaded washer. Some presta valve brands do not have any threads- no washer is used on these.

**Step 14: Prepare your CO2 inflator.**





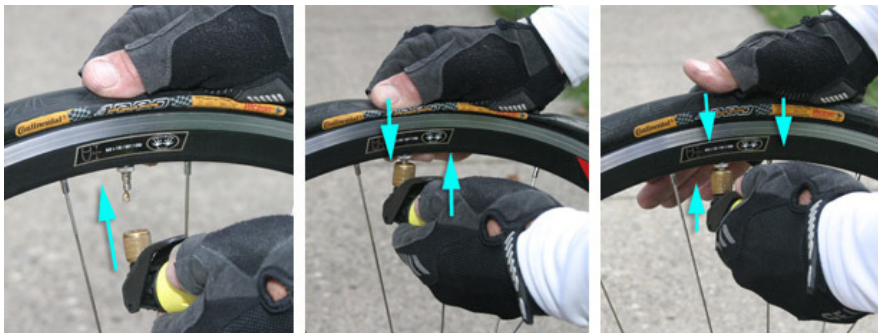
- Prepare your CO2 inflator by threading the inflation head onto the CO2 cartridge. This will pierce the top of the cartridge allowing the pressurized gas to flow into your tire.

*In the first photo above we show carrying the CO2 cartridge backwards to prevent accidental piercing of the cartridge. Simply turn the cartridge around when you are ready to prepare for use.*

**BE CAREFUL:** Never point the CO2 inflator or tip of canister toward your face.

<b>TIP</b>	<p>Always be sure your CO2 cartridges are fresh. carry CO2 cartridges in your bag or CO2 filler so they will not be accidentally pierced.</p>
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**Step 15: Inflate your tire using the CO2 inflator.**



- Double check that your presta valve is unthreaded and in the open position.
- Slide your CO2 inflator nozzle onto the valve and seat it firmly. Press upward with the CO2 inflator and downward on the tire, applying force against each other so they remain snug.
- Use the trigger unit on the CO2 dispenser to shoot short bursts of CO2 into your tire.
- Once the tire has begun to take air continue to fill it with short bursts from the CO2 inflator until at full pressure.

<b>TIP</b>	<p><b>CAUTION:</b> After your first burst visually check the tire/rim to be certain the tire has seated correctly against the rim.</p> <p>If the tire is popping off the rim stop immediately, remove the CO2 inflator and press the presta valve to deflate the tire. Then, re-seat the tire and begin the process again.</p> <p>Note: A 12 gram CO2 cartridge will inflate a 700 X 23c tire to approximately 100-110 psi. A 16 gram cartridge will inflate it to about 115-130 psi.</p>
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**Step 15.5: Remove CO2 inflator and discharge remaining CO2.**





- Firmly pull the CO2 inflator straight downward and off the Presta valve stem.

*The CO2 will freeze moisture in the air and may momentarily freeze the inflator to the valve stem. Don't twist or wiggle the inflator on the valve. You could damage the valve.*

*Be careful touching the valve stem or inflator nozzle- you could flash freeze your finger tips to it.*

- Once removed from the valve stem point the CO2 inflator away from you and pull the trigger to expel the remaining CO2 from the cartridge.

<b>TIP</b>	<b>It's not safe to carry partially discharged CO2 cartridges. Be sure to empty a cartridge that has been pierced. Never point a CO2 inflator at your face.</b>
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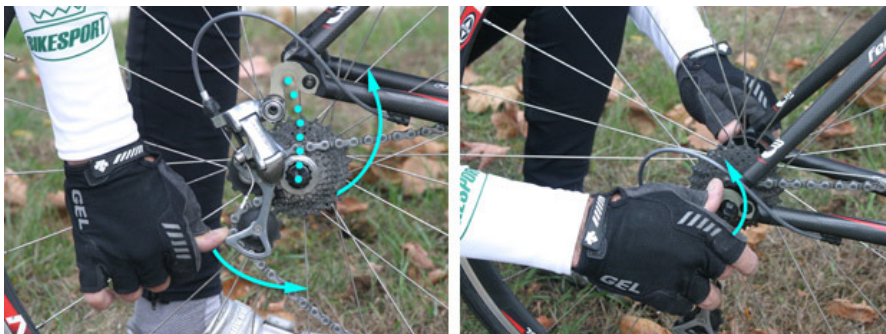
**Step 16: Replace your rear wheel.**



- Replace your rear wheel into the bike frame by standing behind the bike and holding it with your left hand on the chainstay just beneath the brake.
- Use your right hand to sweep the wheel into the frame.
- Be sure to locate the cogset inside the loop of chain on the bike.

<b>TIP</b>	<b>You may need to gently bounce the bike and wheel on the ground to firmly set the rear wheel in place. Be certain the wheel is centered in the frame.</b>
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**Step 16.5: Be sure your chain is back on the outermost cog/slide wheel fully into place.**



- Rotating the derailleur out of the way and setting the chain back on the outside (smallest) cog will make it easier to pull the wheel into place.

<b>TIP</b>	<b>Use both hands to pull the wheel rearward into the frame insuring it is centered and lined up correctly.</b>
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**Step 17: Close your quick release skewer.**



- You've check to confirm your wheel is centered in the frame.
- Now close your quick release lever firmly with the lever being located above the chain stay and below the seat stay of the frame.

<b>TIP</b>	<b>Remember to use your entire hand to close the quick release lever.</b>
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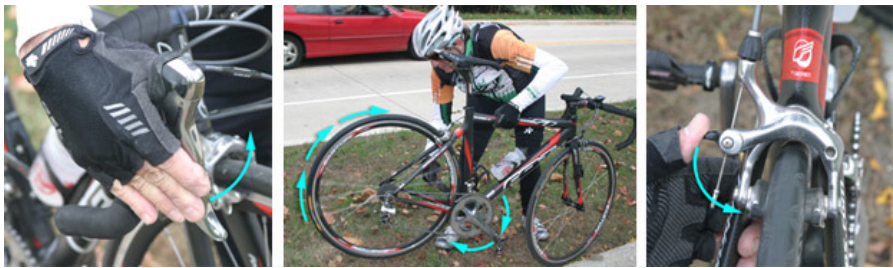
**Step 17.5 Close the quick release skewer (viewed from above).**



- A good view from the rider's perspective of closing the quick release lever.
- This also shows the correct position of the lever once it is closed.

<b>TIP</b>	<b>Notice how the fingers on his left hand are gripping the inside of the left chainstay to gain additional leverage. This makes it easier to close the quick release lever.</b>
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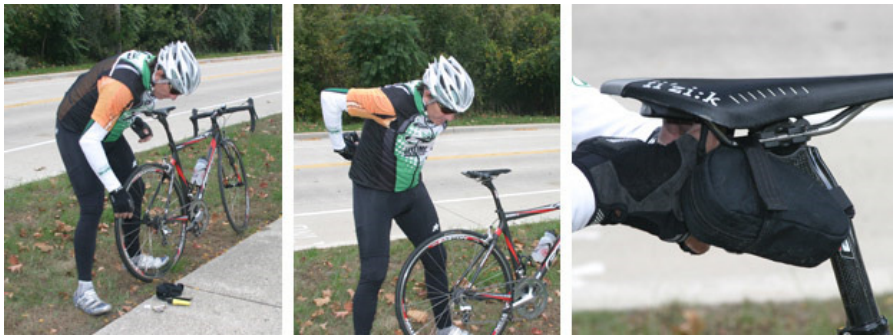
**Step 18: Shift up to an easier gear. Close your rear brake quick release.**



- Use your shift lever to shift up to an easier gear.
- Pick up the rear of the bike and pedal to shift the chain up the cogset to an easier gear.*

<b>TIP</b>	<b>Shifting to an easier gear will enable you to get back up to riding speed easier and will insure your wheel is properly aligned for good shifting.</b>
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**Step 19: Police the area and secure your spare parts: Don't litter! Re-install your bike bag.**

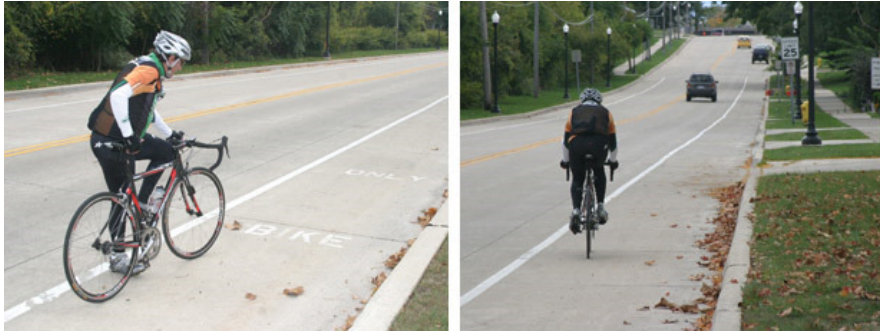


- Pick up your tools and flat inner tube.
- Re-Pack your bag and strap it back under you saddle. Be sure your straps are secure.
- Re-check the area for trash. Don't leave anything behind!

<b>TIP</b>	<b>If you pack you bag correctly using the inner tube as filler material it will prevent the tools from rattling inside the bag when you ride.</b>
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**Step 20: Be sure traffic is clear and get back on the road! You're done!**





**All the tools you need to fix a flat (as featured above) here!**

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