

## BCETS Tech Seminar: On the Road Repair, 2/6/09

### I. Flat Tire

The first and most important step in fixing a flat tire is to bring your bike to a *controlled* stop. Bikehandling with a front flat is especially important. Keep your upper body relaxed and slowly make your way to the shoulder of the road. Do not immediately swerve to the side of the road if other riders are nearby. Also be sure to find a safe place off the roadway, preferably in the shade, to fix your flat.

RELAX! Fixing a flat can actually be a fun and rewarding experience.

Before you begin, check the outside of your tire for sharp debris, and remove anything you find, as it can be hazardous to your fingers while dismounting the tire.

#### 1. Remove the tire:

Begin with one tire bead. Use the bladed end of a tire lever to pry the bead over the edge of the rim, then hook the lever on a spoke to keep it in place. You can repeat this step with a second lever to get even more of the bead removed before final dismounting of the tire. With your last tire lever, work around the rim prying off the bead until it's fully over the edge of the rim. You can now remove the **second bead** by hand, pulling it over the same edge of the rim you started with.

#### 2. Find the source of your flat:

Even if you found something on the outside of your tire, fully check the inside of the tire for a foreign object. Also check the surface of the rim that contacts the inner tube, as a failure of the spoke hole covering (rim tape or spoke hole plugs) can also cause a flat tire. If you cannot find an obvious source of the flat, you can inflate the inner tube and look for the spot(s) where air is leaking out, then find the same spot on the tire, hopefully exposing the object that punctured it. If you do not find any debris stuck in the tire or any problems with the spoke holes' covering, you may have had a **pinch flat**.

Pinch flats are the result of the wheel hitting something hard enough to bottom out the tire and pinching the tube between the edge of the rim and the object you've hit. The pinch flat usually makes two holes in the tube right next to each other, resembling a snake bite, and leaves no debris to be removed from the tire.

**BE SURE TO DETERMINE THE SOURCE OF YOUR FLAT BEFORE REPLACING THE TUBE, OR YOU ARE LIKELY TO HAVE ANOTHER PUNCTURE UPON INFLATING THE NEW TUBE!**

#### 3. Install a new tube and mount the tire:

Lay the tire flat on the ground. Inflate the new tube just enough to make it take a round shape, then insert it in the tire. Next, put the tube's valve through the valve hole in the rim and install **one bead** of the tire onto the rim, working your way evenly away from the valve and ending directly across from it. **Do not use tire levers to mount the tire, as it is likely to pinch your new tube.** Install the second bead in the same manner and your tire is mounted. Inflate the tire part way (about 20-30 psi) and check for any bulges, which indicate improper seating of the tire on the rim. If this is the case, squeeze the beads down into the rim and check again. If the tire doesn't show any bulges, inflate the tire to your preferred pressure and get back on the road!

### II. Shifting Adjustments

The shifting systems on your bike rely on very precise adjustment of the cables in order to function properly, and a problem with cable tension is the most likely culprit of shifting problems that develop during a ride. In order to remedy this situation on the road, shifting components are usually fitted with a **barrel adjuster**, a threaded fitting which allows tension to be added to or removed from the cable without the use of any special tools. Unscrewing of the barrel adjuster will raise cable tension, while screwing it in will lower cable tension.

The shifting problem you are most likely to experience on a ride is slack cables due to stretching of the cables and settling in of the housing and its endcaps if they have been recently replaced. The barrel adjuster is fully capable of fixing this problem on the road.

### 1. Rear Derailleur Indexing Adjustment

If rear shifting is problematic, first check to make sure the derailleur is not bent. Looking at it from behind the bike, the derailleur's two pulley wheels should be inline with the cassette gears. Poor alignment indicates either the derailleur body is bent, or the frame's derailleur hanger is bent. Realignment of a bent rear derailleur or hanger should be performed by a professional mechanic.

#### To check and adjust shifting:

Shift to the gear that uses lowest cable tension (this is your SMALLEST cog, also your HIGHEST gear). Next try to shift down one gear, which adds cable tension. If the chain is slow to shift or does not shift at all, more cable tension is needed. If the chain overshoots the cog, less cable tension is needed. Adjust the **barrel adjuster** on the derailleur body accordingly. Because the gears are evenly spaced, this adjustment should remedy shifting for all the gears. A problem with only certain gears on the cassette indicates other problems, such as poor alignment or worn components.

**The two screws on the back of the derailleur are the limit screws. They adjust the derailleur's range of motion only, and are not related to shifting problems that develop during a ride.**

### 2. Front Derailleur Adjustments

The front derailleur is less likely to need fine tuning, and therefore isn't always provided a barrel adjuster. If your bike does have a barrel adjuster for front shifting, it will most likely be found on the frame's downtube where the cable housing stops and becomes bare cable.

Because of differences in front shifting systems, no one approach covers all possible situations. As mentioned above, the situation you are most likely to be faced with on the road is low cable tension due to new cables and housing settling in.

#### To check and adjust shifting:

Shift to the largest chainring in front and smallest cog in the rear. These are the two outermost extremes of both derailleurs' ranges of motion. If the chain is rubbing on the outer cage of the front derailleur, more cable tension is needed to move the front derailleur far enough to clear the chain. Unscrew the barrel adjuster to add cable tension until there is no rubbing in this combination of gears.

(Note: you will find it easier to turn the barrel adjuster if you first take the tension off the cable by temporarily shifting to a smaller chainring.)

Any further adjustment of the front derailleur may require the service of a professional mechanic.

### III. Wheel Truing

Wheels that are out of true indicate possible structural problems and should be inspected by a professional mechanic. The procedure below is a temporary solution only, meant to make a bent wheel straight enough to clear your brake pads and get you home from your ride.

1. Find the spot(s) in the rim where contact is made between rim and brake pad.
2. At the point of contact, add tension to spokes opposite the interfering brake pad, and lower tension on spokes on the same side as the interfering brake pad.

Begin by evenly adjusting two opposing spokes as described, and only proceed to adjusting more spokes if the rim is still not clearing the brake pads.

Spoke tension adjustments are made by turning the **nipple**, which is best described as a nut at the end of a long, thin bolt (the spoke). Twisting the nipple onto the spoke increases tension, while twisting it off the spoke decreases tension.

NOTE: A spoke wrench is used to turn the nipple, and is not commonly included with popular bike multi-tools.