

## Maintain Your Bike

Bicycles are relatively-simple mechanisms that can go a long way with little or no attention. However, they can also be expensive to purchase and they can be expensive to bring back to standard, if not routinely maintained, that is, if let go beyond a certain point. In addition, especially with key parts such as brakes, steering and tires, safety can be affected by poor maintenance. Therefore, the RBC schedules clinics each year, open to all comers, which help cyclists learn more about this useful and rewarding activity: Bike Maintenance.

First, some of the principles of good maintenance:

- 1 -- All metal-to-metal contacts, e.g., where the seat post attaches to the frame or where the pedal attaches to the crank, need to be first treated with a thread locker such as Loctite or with a lubricant such as grease or oil; the choice depends upon the application.
- 2 -- All screws and bolts need to be tightened to the correct tightness. A connection can be weakened by tightening it too often or too much: There is a too-loose and a too-tight and a just-right. Torque wrenches measure this tightness, but experienced mechanics often go by feel. Ask a mechanic to show you.
- 3 -- All the expendables, e.g., brake shoes, tires, tubes, cables and housing, need frequent inspection and periodic replacement.
- 4 -- All metal and carbon parts of the frame, fork, seat post, handlebar, stem, crank, pedals, rims and so on need frequent cleaning and careful inspection for cracks and for scratches that can act as starting points for the propagation of cracks. Steel and titanium tend to fail over time, whereas aluminum and carbon tend to fail suddenly, therefore, aluminum and carbon need even more frequent cleaning and even more careful inspection.
- 5 -- All of the moving metal parts such as the chain, need frequent cleaning and proper lubrication, that is, with enough of the right lubricant but not too much of it. A clean drive train will be quieter, smoother, last longer and the shifting will also work better. Chains especially, wherein lie half of the bearings in your bike, need lubricants specially made for them, whereas most other parts of the bike are tolerant of a variety of lubes such that grease and oil can often be interchanged.

Second, let's look at those areas of the bike that have the most effect on safety: skewers, tires, steering and brakes.

### Skewers

These hold the wheels securely to the frame, but only if they are in proper working order and only if they are correctly adjusted. Ask for help to learn about this art.

## **Tires**

Tires have a life expectancy and one extends it at one's peril. Inspect the sidewall of the tire for cuts and cracks, and inspect the tread of the tire for worn sections. If the cord -- the cotton, silk or nylon fabric that forms the structure of the casing -- is visible through a hole in the tread, you need a new tire asap. Put the newest, best tire on the front, the second-best tire on the back and save the third-best tire as your spare, to be used only temporarily and only then when one of the others has gotten too bad to continue on. Moving the front tire to the back and putting a new tire on the front is the best way to rotate your tires for economy and safety.

The tire needs to be properly centered over the rim so that it does not wobble side-to-side as you spin the wheel. A tiny ridge of rubber is molded into the sidewall as a visual aid in aligning the tire with the rim. Do this with the tire inflated to about twenty percent of the pressure you intend to finally use; otherwise the tire is too tight on the rim to move by hand.

## **Steering**

Modern bikes have the handlebar attached to the steerer with a threadless stem. These stems are tightened with allen bolts. The headset itself is adjusted with an allen bolt and the stem holds the headset at the proper adjustment. If this component array is assembled without regard to the proper preloads, the steering may bind. Similarly, if things aren't tight enough, they may loosen even more in service. If the steering ensemble becomes loose enough, it may eventually cause permanent damage to the components and possibly even to the frame. At some point in its history, a steering system that's too loose or too tight will become unsafe.

A steering ensemble that is too dirty, too rusty, too loose, too tight or not properly lubricated may cause a bike to shimmy: At higher speeds, an annoying shimmy can become an uncontrollable, violent oscillation aka speed wobble. To check your steering, hold the bike off the ground and lean it from side to side as if rounding a turn in the road, no hands on the handlebar. The front wheel should swing easily from side to side when you do this. If not, the headset is too tight. Put the bike down and lock the front wheel with the front brake. Rock the bike gently back and forth. If you feel a click in the steering, the headset is too loose, or the front brake is too loose. (This is easier to learn and to teach in a hands-on clinic, which the club offers, than to describe in words.)

Stand in front of the bike and clamp the front wheel between your knees. Attempt to force the handlebar downward, and attempt to turn the handlebar side-to-side. If it moves in either case, the retaining bolts are not tight enough. Remove these bolts and lubricate them before reassembling. Counterintuitive: Lubricating the bolts enables you to make them tighter.

## **Brakes**

The modern caliper brake that's almost standard on road bikes has three parts that are expendable: the pads or shoes, the cables and the housing. The rim of the wheel is also part of the brake, and it can wear to dangerous levels. Clean the road grit out of your pads from time to time, because tiny bits of grit will score the softer rim and the aluminum of the rim will eventually crack along the score marks. Even with perfectly clean pads, the aluminum rim will eventually wear so thin as to be unsafe for riding. This usually takes tens thousands of miles, but it may only take thousands of miles riding in the rain/mud/dirt.

Once a brake cable has become frayed or a single strand of the multi-strand cable has broken, it's past time for a new cable. If you replace the bar tape once a season, you could take this opportunity to preemptively replace all the cables and housing. A weakened cable is unsafe, and if it requires replacement on the road, inconvenient at best.

Threaded brake bolts, which attach the calipers to the frame and fork, rarely break, but a failure here is catastrophic, and if your calipers are old or if the brakes are not working smoothly, these bolts would be worth inspecting for rust and cracks.

Periodically, perhaps before every ride, squeeze the brake levers hard to see if they bottom out against the handlebar. If they do, you have reached the limit of your brakes without reaching the minimum braking power that you need. Adjust the brakes as needed.

Third, some other issues:

## **Tire Pressure**

The optimum tire pressure is usually somewhat less than that printed on the sidewall of the tire. That value is a starting point. With your entire weight on the bike, you should have trouble seeing the degree of deformation in the tire where it meets the pavement. If it's easily seen, the tire is under inflated. Under-inflated tires will frequently flat, because the tube punctures when you ride over obstacles such as RR tracks.

## **Tubes, Valves and Pumps**

There are two common types of valves for inner tubes: Schrader are the rugged, heavy valves found on cars and trucks and on some touring bikes, and Presta are the slender, lighter ones found on the modern road bike. Each has its good points, but be sure that your pump will fit your valve. Also be sure that the valve of your spare tube fits the hole in your rim. While it might be possible in an emergency to use the smaller valve in the bigger hole, and indeed adapters are made for this, the bigger valve will never fit into the smaller hole.

## **Shifting**

New shift cable and housing will make your shifting work better, and periodically replacing shift cables will minimize the chances of one breaking while you are on the road.

Very likely, if your shifting is not working like it should, replacing the cables and possibly the housing will fix it. Often a bike will signal the coming of a broken cable by giving the rider a few hundred miles of balky shifts.

However, long before needing new shift cables, new bikes will slowly experience stretching of the cables, which will cause shifting to balk. Usually the designer provided you with in-line cable adjusters, which are really housing adjusters, which will allow you to effectively take up the stretch in the cable by making the housing longer.

Derailleur limit screws are provided to prevent the derailleur from jumping off the last sprocket and jamming into the frame. Some experimentation with the phillips screwdriver will disclose how these affect the position of the derailleur. Turning them clockwise brings the derailleur cage closer to the center of the range of motion. Two or three brands of chain watcher are available that help keep the chain from jumping off the smallest chainring and jamming into the frame.

## **Bearing Types**

Discussing the merits and demerits of cartridge versus cup-and-cone bearings is beyond the scope of this article, but they have a maintenance schedule, too, particularly the cup-and-cone ones. Like your bike, cup-and-cone bearings will last almost indefinitely, but only if properly maintained.