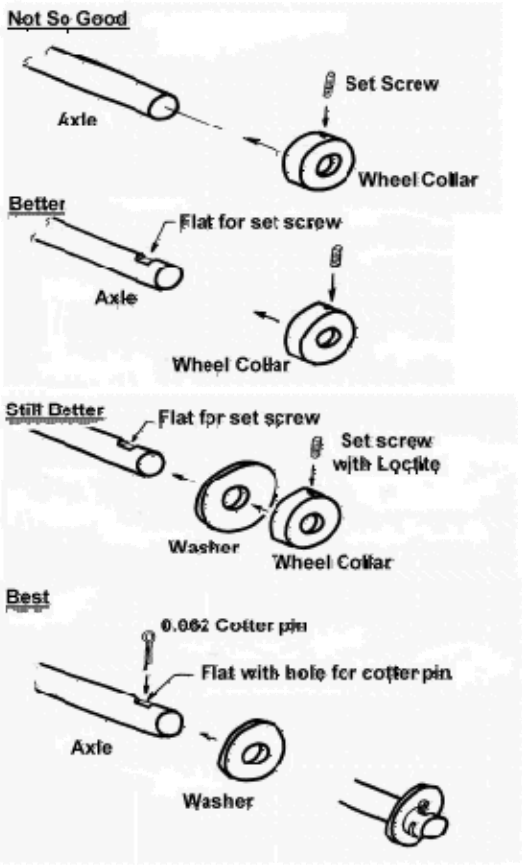
Keep those wheels secure!

by Roy Vaillancourt

There are a variety of methods used to secure wheels to their axles. The most widely used method -- the wheel collar alone -- happens to be the most insecure. This method's obvious drawback is that vibration loosens the set screw and the wheel collar separates from the axle. This situation almost always results in lost wheel collars, lost wheels and rough landings.

Most modelers would say the fix for this is a little lock-tite on the set screw. That may be fine for a while, but removing the wheel collar now becomes a chore. Stripped set screws are a real bear to extract!

The sketches at right show four progressively better methods of retaining the wheel. These are the most common methods employed today. As the sketches show, the cotter pin method is far and away the best and most secure method. Cotter pins are cheap, easy to install and remove, and they don't rely on torque or locking compounds. In short, they're a sure thing!



Although most modelers avoid the cotter-pin method because of the difficulty in drilling a hole through the axle, it's really not that hard if you know how. The main construction steps are:

1. File a flat on the axle where you want the hole to be.
2. Center punch the spot where the drill will start.
3. Use a good sharp drill run at a slow speed.
4. Use oil as a cutting agent to help the drill.
5. Use steady pressure on the drill and periodically clean away the chips.
6. And re-apply oil from time to time.

If you follow these steps, you'll find the drilling process isn't very difficult. To make the drilling even easier, you may want to anneal (soften) the area of the axle that will contain the hole. To anneal the axle all you need is a standard propane or butane torch like those used to solder copper water pipes.

Clamp the axle in a vise with only the last 1/4 to 3/8 protruding past the vise. The vise will act as a heat sink during the annealing process. This keeps the "heat affected zone" localized so that only the area that will contain the hole is annealed. Heat the protruding portion to a cherry red color then remove the torch. Don't over heat the material but let everything cool naturally. **Don't** blow on it or use a fan to cool it. *Be patient.* Let it cool to room temperature naturally before removing the axle from the vise. If it cools too quickly it will become harder and more brittle!

If you can't mount the axle in a vise, or don't have one, use a pair of vise-grip pliers as a heat sink instead. Two pairs back to back are even better! Once everything has cooled to room temperature you should be able to "cut" the axle with a file very easily. Then proceed as described above. You'll be surprised at how easily the drilling will proceed.

Go slow; be careful; and good luck!