

### Go with the Flow...

Every faceter will develop his or her own techniques, but there are a few general guidelines about the water drip that will help ensure consistent and successful results. First, make sure that there is a small but steady flow to wash away cutting residue. Too little water will allow build-up of swarf on the lap, produce scratches, and potentially overheat the stone. Too much water causes hydroplaning, just like on the highway, and water doesn't cut nearly as well as the diamonds embedded in your lap.



*Figure 5-34 Locate the water drip inward of the minimum radius of lap you plan to use, and ensure a steady flow of water to wash away cutting residue and prevent scratching. Wiping a clean finger from inside to outside can help distribute the water.*

Centrifugal force will carry the water and residue to the edge of the lap and over into the splash pan. Make sure that all of the usable area of the lap is getting wet: sweeping inward onto a dry area can produce nasty scratching (Figure 5-34).

You should also regularly examine your progress. I find that having a few strips of paper towel at hand allows a quick “clean and dry” before putting the stone under the loupe.

The paper towel strips will soon get wet. You can throw them out or be green and hang them up to dry and re-use. Needless to say, you should discard the paper towel strips when they wear out or when you switch to a finer grit lap.

Because the P1 facets are arranged symmetrically around the gem, their intersection automatically defines a point that is on the centerline or rotation axis of the quill. Think of a Native American tipi or the free-wheel pre-form described in Chapter 8.3.2 if you don't understand why such facets define a center point. By the way, you will see why this center point is called temporary soon enough.

Begin by cutting three of the P1 facets to the same depth with the finer lap. Three such facets, when distributed evenly around the stone, are enough to define the TCP. You will then have to cut the remaining P1 facets to this meet point.

GeM101 has six-fold symmetry, so selecting three symmetric facets is easy. The obvious choice is at indices 8, 40, and 72. Set the facet angle to  $42.6^\circ$ , fire up the machine, and start cutting at index 8. Because you have made a pre-form, this process should go relatively quickly. Stop when all evidence of the rough scratches from the coarse pre-form lap has disappeared. With experience, you will know exactly how far to go, but this is a first, learning gem, and it is better at this stage to cut away too much rather than too little (within reason, of course).

Switch to the 40 index and cut to the same depth. Your faceting machine may have a hard stop to help you here, or you may have a soft-stop needle or depth of cut indicator. In any

case, try to achieve the same depth while ensuring that all of the pre-form scratches have been eliminated. Move on to the 72 index and repeat. Your stone should look like Figure 5-35.

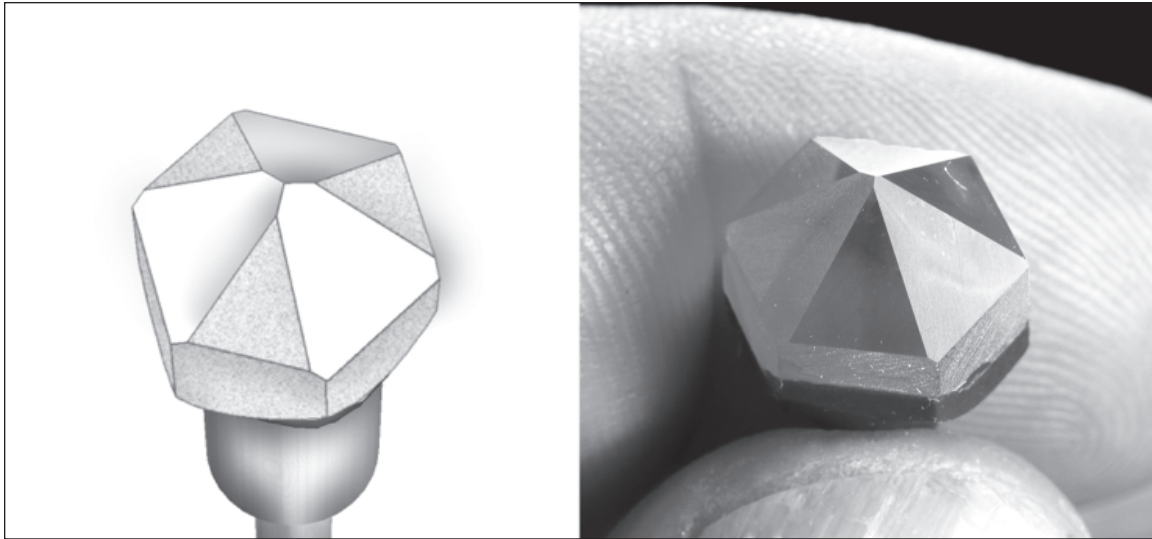


Figure 5-35 Three of the six P1 facets cut to a temporary center point.

Before proceeding with the remaining P1 facets, it is a very good idea to check the accuracy of this temporary center point. The easiest and best way to do this can vary from machine to machine. For example, a depth-of-cut indicator (see Chapter 20.7) can be very helpful, but the general procedure described here should work on almost any machine.

The basic principle involves raising the height of the faceting head and then lowering it (with the lap turning slowly) until the stone barely touches the lap. Just as the gem makes contact, imperfections and warping of the cutting surface will result in an intermittent “tick-tick” sound as the stone touches the highest points on the lap. You may have heard the expression “cutting by ear” thrown around in conversation with other faceters. Congratulations, you are now also an ear-cutter.

When you have found the right spot at index 8, move on to 40 and listen. Almost certainly, the stone will be making more or less contact with the lap, hence producing a different sound. Try again with the 72 index. The facet with the least contact has already been cut the deepest, so you should re-adjust the height and cut a little more on the other two. When all three match, you have achieved a very accurate center point. Note that the high points on the lap will almost certainly vary with radius. I mark a circle on the lap with a permanent marker and test the TCP at a constant distance from the nut (Figure 5-36).



Figure 5-36 Mark the lap with a permanent marker and always test for depth of cut at the same radius.