excellent finish. Its hardness also makes it very brittle and easy to damage. The diamond's hardness allows it to wear very well with almost no sharpening required.

Whichever tool you use, its height is crucial. Diamonds are especially sensitive to changes in height and angle. A minor change can make a big difference in the quality of the surface finish.

In either case, the tool must be set dead center to the commutator. Use the flat shim stock provided with your lathe and/ or make your own shims out of plain paper. If you don't have the instruments to measure cutting tool height and are eyeballing it you may err by a few thousands on the high side but never set the tool below center. It is best to experiment on an old stock armature until you get the quality of cut that pleases you.

The gibs are the plastic pieces in the dovetails on the carriage and cross-slide. The gibs both guide and take up slack, and they're designed to wear with use so the other parts of the lathe won't. In order for the lathe to work its best, all gibs should be kept clean, well oiled (use heavy silicone grease) and properly adjusted. The gib adjustments are the small socket head set screws found on the sides of both the carriage and cross-slide.

The gib adjustment for the carriage is located on the front of the lathe and below the cross-slide handwheel. The carriage should be adjusted so that it is free of play, yet guides smoothly so you get a clean, even cut on your commutators. These adjustments will be properly set from the factory, but you must fine-tune the adjustments as the gibs wear with use.

As you become proficient with your lathe, you may want to take lighter and lighter cuts to extend the life of your race motor as much as possible. To this end, when making a second or third cut, try moving the cutting tool in only half of 1/1000th-inch. This is done by looking at the indicator lines on the handwheel and only turning the hand wheel half a line. It takes practice and a delicate hand to know when and how to do this.

Keep in mind that when cutting a circumference (like a commutator) a .001-inch cut actually reduces the diameter by .002-inch. A new commutator measures about .292-inch, and you should never cut a commutator smaller than .275-inch. At .275-inch the commutator is too thin. You can snag a commutator segment and ruin both the armature and your diamond-cutting tool. Making two .001-inch cuts per rebuild (thus reducing the diameter by .004-inch) you will get 4 rebuilds per motor. If you are able to clean the commutator with 2 or 3 cuts at .0005-inch each (instead of .001-inch) then you can get 7 to 8 rebuilds per motor. Just remember that the final cut must have a