Use apparatus which allows a hollow brass cylinder, heated by two Bunsen burners, to expand against, and break, a hardened piece of ¼” diameter drill rod 2” long. (See Note 1.)

Place hardened (See Note 2) piece of drill rod through hole in 1” stainless steel rod, and turn the nut to tighten as much as possible by hand. Place shatter-proof glass shield between the drill rod and the students. (See WARNING.) Light Bunsen burners, turn up as much as possible, and wait for rod to break. It usually requires from 20 seconds to 2 minutes to break, depending upon how snugly the nut has been tightened.

Note 1: Because of an air space between the stainless steel rod and the brass cylinder, the rod is heated far less than the cylinder. Furthermore, brass has a significantly higher coefficient of expansion than stainless steel.

Note 2: The drill rod pieces have been hardened. They have been heated slightly hotter than a cherry red (until surface just starts to flake), quickly immersed in water, and left in water to cool.

WARNING: Occasionally, upon breaking, pieces of drill rod fly off with significant velocity. In addition to using the glass shield to protect the students, the instructor should always stand behind the nut end of the apparatus.