Subject: Re: That's pretty cool!
Posted by Wayne Parham on Thu, 10 Aug 2006 15:50:59 GMT
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The clearance between a new Harley valve and valve guide is about 0.0015". Older Harleys required more clearance but they were still pretty tight. The clearance is there to allow for oil film and not for expansion. Metals do expand from heat, so there is a tiny expansion, but the main reason for the clearance is that there be room for oil film.
Valve guides are designed to dissipate the heat from valve friction into the head. The best head designs have a large surface area contact between the valve guide and head so that heat transfer is good. Old Harleys are an example of a bad design, there wasn't enough surface area so their valve guides got too hot. New ones like used in the Evolution are better; They figured it out.The thing is, you can't make a valve guide larger hoping to account for heat expansion. If the valve chatters inside the guide, it will make it hotter than if the fit were closer. Ideally, you want the valve to ride on a film of oil and have basically zero clearance beyond what it takes to provide for the oil. So if you have a valve guide that gets hot enough to expand appreciably, then it has too much clearance and will get hot from chattering.Long story short - A new valve fits nicely into a new valve guide with very little clearance. After you apply a thin film of oil, there is zero clearance.