

Duke Williams comments re rocker arm ratio (1.5), taken from a NCRS Tech Forum

There are a lot of misconceptions about rocker arms. Many think that the ratio varies from piece to piece, but that is a myth.

The variation is over the range of lift - about 1.37:1 at low lift and about 1.44:1 at max lift with a 0.3" lobe, and most will measure the same total range within the accuracy of dial indicator measurements made at the pushrod and valve.

No rocker arm design that uses a rocker shaft or pivot ball like Chevrolet has a constant ratio. It's just a basic fact of geometry.

So there is no such thing as a "true" rocker arm - 1.5, 1.6...whatever. They all vary over the range of lift regardless of the claimed ratio because the rocker arm ends move in an arc, and on Chevrolet style ball-pivot rockers the fulcrum actually moves over the range of lift, but it's fixed with shaft mounted rockers.

It amazes me that in over 50 years of reading various car magazines I have only run across one article that alluded to this issue, but no details.

From high school geometry I knew the ratio could not be constant, but I didn't get around to actually measuring the variation until the mid-seventies. I have suggested to many to do it themselves, but only a couple have taken up the challenge over the years despite how simple it is to do while disassembling or assembling an engine. All you need are two dial indicators, a pad on a clipboard, and a little patience.

I'm not sure about the Crane rockers, but I think they are geometrically identical to OE rockers, so they will exhibit the same variation of ratio from zero to full lift, but then someone should measure them to be sure.

I made the same suggestion as Joe to Robert on the phone. The heads have screw in guide plate/studs, which is a no-no unless the pushrod holes are opened up on early heads, but a visual check comparing to an unmodified head showed that they had been opened up.

On early heads the pushrod guides are essentially the oblong pushrod holes in the head, and if you try to "guide" the pushrod at two points, the usual result is bent pushrods. If guide plates are used the pushrods MUST have hardened tubes, which early pushrods may not have. I believe the Crane pushrods have hardened tubes, but Robert has to confirm.

I always wondered how Flint formed those non-round pushrod holes and suggested to Robert that they were broached. He agreed and mentioned he has many years' experience in machining and broaching is the most likely way they were formed.

For all engine rebuilds I recommend using the original rockers/balls/pushrods assuming they have been bagged as matching sets off the engine and pass visual inspection for galling which most will, even a set you pull off a junkyard engine.

"Roller tip" rocker arms are a marketing gimmick and a total waste of money as are "high ratio" rocker arms. The money wasted on these heavily advertised hot rod parts would be much better spent massaging the heads for better flow. That's where real and significant power gains can be had in the upper third of the rev range without screwing up the idle behavior and low end torque.

For most engine restorations all you need is a new OE equivalent cam, lifters, and OE replacement valve springs, and you can buy a set of 16 Sealed Power VS677 (3811068 equivalent) valve springs for about 20 bucks. Depending on cam price, which can be as little as 50 bucks for the Sealed Power equivalent of the '67 up "300 HP cam", you can restore the entire valve train to as new with dead-on OE reliability for less than the cost of a set hot rod rocker arms.

The only application that I recommend roller trunnion rocker arms are serious racing engines that see sustained operation above 5000 revs, where the rules permit their use.

Duke