Model A & B

Valve Tappet Adjustment

Rule of Nine

Described below is a timesaving method for adjusting or checking the adjustable valve tappet clearances when the engine is in the car and you have to hand crank it. Original Ford valve tappets (push rods in Ford nomenclature) were solid and non-adjustable, but all modern replacements are adjustable.

First of all, it is not necessary to know where the pistons are positioned. The tappets (push rods as Ford called them) must be **adjusted** with thin wrenches when they are on the peak of the cam lobe, and the clearance must be **measured** when they are on the heel of the lobe (lowest point). Hand crank the engine a few times and watch the valve stems and you will see this.

The Issue:
Ideally, you would want to adjust the gap when the valve tappet was on the heel of the lobe and the gap could be measured with a feeler gauge. Unfortunately, the tappet adjustments are not accessible at that position, and the cam must be rotated and the tappet raised to make an adjustment. At that point the tappet can be adjusted, but the gap cannot be measured. Thus a lot of cranking is typically required, alternating between measuring and adjusting.

Here's the Trick:
Valves are numbered 1 through 8, from front to back. Regardless of which valve tappet is on a cam lobe peak (and can be adjusted) at a given instance, there is another corresponding valve tappet that is on its lobe's heel (and whose gap can be measured).

By understanding the relationship between the valves, **(Rule of Nine)**, you can do two things at once and adjust and measure multiple valves in steady progression (if you keep track of your actions). This will greatly minimize the amount of time spent cranking, measuring, and adjusting.

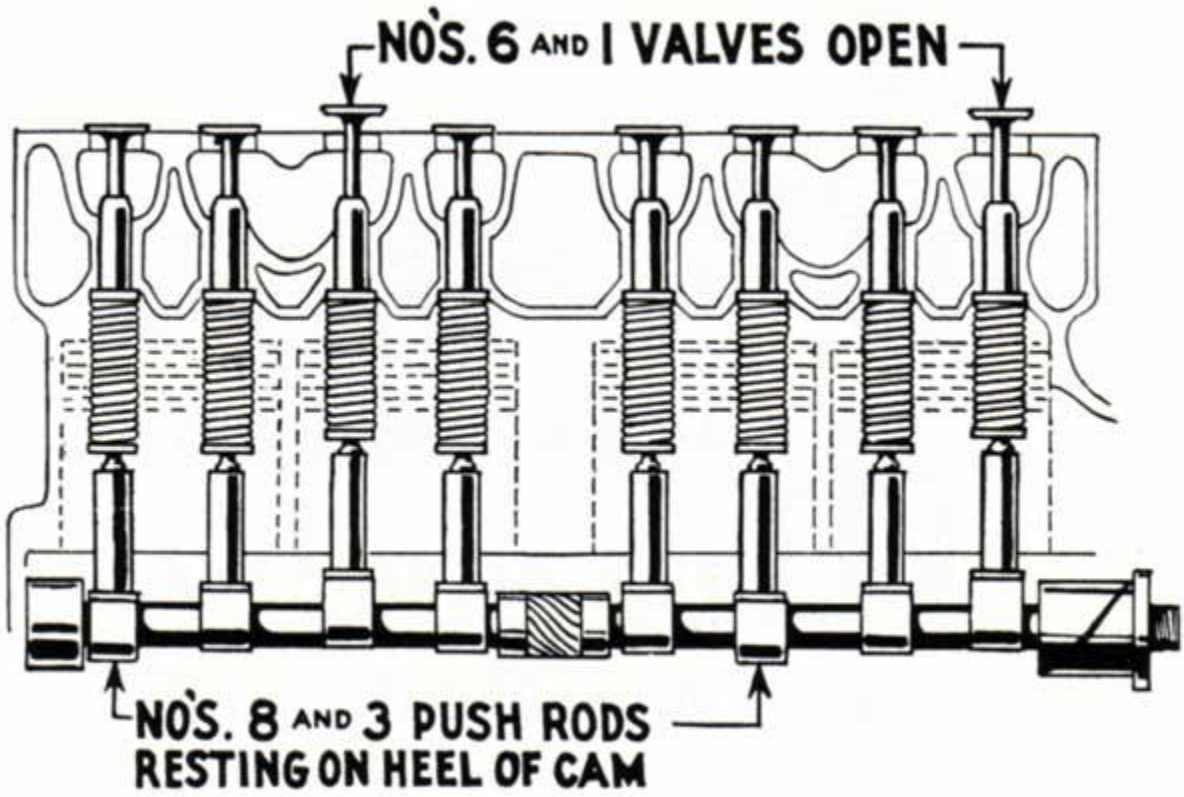


Fig. 685

The Rule of Nine relationship works like this:
If for instance the #6 valve is full open, then it can be adjusted with wrenches. Also at the same time the #3 valve tappet ("9" minus "6" equals "3") is on the heel of its cam lobe and its gap can be measured at the same time as #6 is being adjusted.

Now crank a little more until a different valve is full up and adjust it, and/or measure the gap on the other valve tappet whose sum equals "9" (e.g. if #2 is full up, then #7 can be measured, and #2 could also be adjusted if you know how much). Keep cranking until a different valve is up, and adjust it and measure the gap of the one whose sum equals "9".

Do the Math:
Adjustable self-locking valve tappets use a 24 TPI bolt, which equates to a pitch in inches of 0.042" (one revolution of the bolt changes the gap 0.042"). Since the bolt head has six wrench faces, it is fairly easy to estimate rotating the bolt 1/6 of a revolution, **which equals one wrench face, which equals a 0.007" change axially at the gap.**

Furthermore, with a little eyeball engineering, you can guesstimate **1/3rd of a rev of a hex wrench face** with the two wrenches in your hand. This is ~0.002" of valve gap adjustment per 1/3 wrench face rotation.

With a little practice, you can measure and record the gap when the valve tappet is on its cam lobe heel, and can adjust it to within 0.002" of where you want it the very first time that same valve tappet is on its cam lobe peak (and is accessible by wrenches).

This can really minimize the amount of hand cranking necessary when the engine is in the car. If the engine is on a stand, then perhaps a lot of cranking is not such a big deal.

This procedure works very well on Model A camshafts, and quite well on Model B cams, though B cams have a slightly different lobe separation angle and the 'down valve' is not as centered on the heel when the corresponding valve is at its peak.

Recommended Tappet Clearance (inches)

Camshaft Design	Intake Valve Clearance (gap)	Exhaust Valve Clearance (gap)
Model A A-6250	0.015	0.015
Model B B-6250	0.015	0.022
Stipe IB330	0.012	0.012
Stipe IB340	0.012	0.012
Stipe RR340	0.012	0.014

The table above shows the manufacturer's recommended design tappet (push rod) clearances (cold) for several cam profiles.

A typical clearance setting of 0.013" intake and 0.015" exhaust is also commonly used by many people, and is also used when the cam profile or the cam grinder's recommendation is unknown.

Important Note:
It is best to avoid setting the exhaust gap too small, as this can create insufficient heat transfer time for the valve on the seat, and can ultimately burn the exhaust valve.

The linear thermal expansion of a hot exhaust valve also has the effect of increasing its length and decreasing the clearance gap at a higher rate, compared to the expansion of a cooler intake valve's length.

When in doubt, err on the side of setting the exhaust valve gap larger, rather than smaller.