

1964 - 1965 Corvette: Technical Article: "30-30" Solid Lifter Cam Valve Adjustment

"30-30" SOLID LIFTER CAM VALVE ADJUSTMENT

By John Hinckley and Duke Williams

The traditional method of adjusting valves one or more cylinders at a time with each cylinder at TDC is fine for hydraulics and for most solid-lifter cams, but NOT for the factory "30-30" solid-lifter cam used in '64-'65 L-76 327/365 Corvette engines (and in '67-'69 Camaro 302/290 Z/28 engines); this cam has VERY long clearance ramps that are .020" high, and at TDC for any cylinder, both the intake and exhaust valve for that cylinder are still on their ramps, NOT on the cam's base circle, which is why the Service Manual for all cars so equipped says specifically to set them "hot and running".

There is, however, a better way to adjust the valves with a "30-30" - you can set them "cold and not running" by setting the intakes at 90 degrees ATDC and the exhausts at 90 degrees BTDC - so the lifters are on the base circle, not on the ramps. This has been confirmed with cam lift/crank-angle diagrams, and I've done mine this way - results in a nice mechanical "singing" sound, no "clacking", it runs better, sounds better, idle is more stable, and throttle response is improved. Several other Z/28 owners have followed this procedure as well since we developed it, and all of them have seen the same positive results.

Set them cold at .026"/.026". The actual measured (stamped rocker arm) ratio at the lash points is actually about 1.37:1 (not the design 1.5:1, which is a max lift measurement), so the clearance ramp, which is exactly .020" high on the lobe, is all taken up at .0274" clearance; .030" clearance with the valve closed is too loose - the ramp ends/begins before the .030" clearance is taken up, resulting in the valve being lifted off and returned to the seat at greater than ramp velocity. This will contribute to valve seat recession, and can cause valve bounce at the seats at high revs - it will also be noisy.

You can adjust two valves at each 90-degree rotation point, starting at #1 TDC, turning the crank 90 degrees at a time seven times (measure and mark your balancer first at 90-degree intervals from TDC). Removing the plugs simplifies rotating the crank, but you were going to change them anyway, right? Proceed as follows:

TDC #1 - 8E, 2I
90 deg. - 4E, 1I
180 deg. - 3E, 8I
270 deg. - 6E, 4I
0 - 5E, 3I

90 deg. - 7E, 6I
180 deg. - 2E, 5I
270 deg. - 1E, 7I

Start at TDC #1, then rotate 90 degrees at a time, setting at .026" cold. If you like, you can then go back after you're done to each cylinder's TDC position and check clearance on that cylinder's two valves, and you'll find that they've closed up to .024", indicating that both valves are still on the ramps at TDC, as I pointed out in the beginning.

This progressive procedure will ensure that you are on the base circle on ANY OEM Chevrolet cam for adjustment, and the factory-recommended clearance on other OEM Chevrolet small-block solid-lifter cams should be factored as well by the 1.37:1-vs.-1.5:1 ratio difference at the lash point and rounded-down to the next-nearest thousandth or two to ensure that the valves are picked up and seated at ramp velocity.

What about the original "097" Duntov (used from late '56 to '63)? The "097" Duntov was designed for .012"/.018" clearance with 1.5:1 rocker arms, but in 1963 the intake clearance was revised to .008", and this was also recommended in Corvette News back in the late 50's for "weekend competition events"; the tighter intake clearance gave a bit more effective inlet duration. Factoring the original .012"/.018" by the 1.37/1.50 rocker ratio correction yields .01096"/.01644, call it .010"/.016", so if you're already running the .008" intake clearance, it shouldn't be tightened any further. A complete crank angle/cam lift diagram in Corvette News, Vol.8, No.4, indicates that neither the exhaust nor the inlet is on the clearance ramp at TDC of the firing stroke, so it's OK to adjust both the inlet and exhaust at TDC with the "097" Duntov cam.

What about the later early-70's "LT-1" solid-lifter cam? In the case of the LT-1, it's OK to adjust the intakes at TDC (its closing ramp ends about 10 degrees BTDC, so it's off the ramp at TDC), but the exhaust is still on its ramp at TDC, so they should be set at 90 degrees BTDC. Both intake and exhaust recommended clearances should be factored down by the 1.37/1.50 rocker ratio correction here as well, from the factory spec of .024"/.030" to .021" for the intakes and .026" for the exhausts.

This MAY apply as well to aftermarket solid-lifter cams, as their clearance specs may also assume the published 1.5:1 Chevrolet rocker arm ratio (which only exists at full-open position, if at all). Check with the cam manufacturer's Tech line to be sure.

Trivia - the point of max inlet lift on the "30-30" cam is at 112 degrees, with a lobe separation angle of 114 degrees (angle between points of max lift, not the geometric center of the lobe - the lobes on the "30-30" cam are asymmetrical)

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