

APPLICATION OF GOOD PARTS ROLLER ROCKERS

Replacing the stock 1.46:1 ratio rockers with 1.55:1 ratio rockers will increase your valve lift by approximately 6.5%, while 1.65:1 ratio will increase the valve lift by approximately 13%. To calculate your net valve lift, multiply cam lift by rocker ratio, then subtract the valve clearance.

Valve clearance should be increased by the same percentage as the increase in rocker ratio to maintain the recommended clearance at the cam. To calculate a recommended valve clearance a cam manufacturer or re-grinder will multiply the clearance they want at the cam by the rocker ratio. Often, they will use a nominal ratio of 1.50:1 instead of the actual stock ratio of 1.45:1. When changing to a different rocker ratio, you need to change the valve clearance by the same percentage you changed the rocker ratio. If you have a specification for your cam showing the proper cam clearance you can simply multiply this by the new rocker ratio to calculate the proper valve clearance. If your cam specification only shows valve clearance then divide it by the stock rocker ratio of 1.45:1 (or in the case of a reground cam the manufacturer may have used 1.50:1) to calculate the clearance at the cam then multiply by the new rocker ratio to get the new valve clearance.

Increasing rocker ratio and/or valve spring pressure increases lifter pressure on the cam. Increased pressure on the cam may cause premature lobe failure. To minimize this possibility, choose valve springs with the minimum pressure required to avoid valve float at top engine RPM.

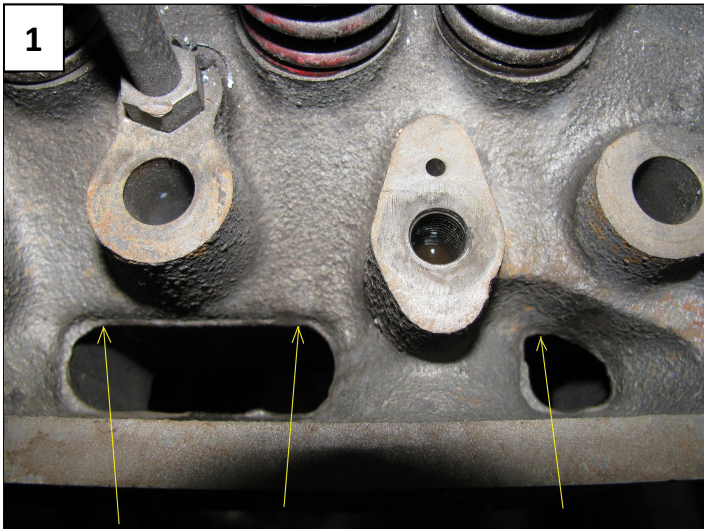
SPITFIRE ROLLER ROCKER ASSEMBLY INSTALLATION INSTRUCTIONS

CAUTION: DO NOT exceed 18 ft/lb. torque on adjuster nuts.

- 1) Remove the rocker cover and the original rocker assembly. Remove the push rods and check both ends for wear. Replace if needed. Turn all valve adjusters fully counter clockwise.
- 2) Align the pedestals with the mounting studs and lower the roller rocker assembly onto the head without the push rods in place. It may be necessary to remove the cotter pin in the end of the shaft to fit the pedestals onto the studs. The cotter pin keeps the assembly together during shipping but serves no purpose after the assembly is installed on the engine. Check the alignment of each roller to the valve stem. The bolt hole clearance around the stud may allow you to slide each pedestal slightly front or back to adjust the alignment. If necessary, shim washers may be added or removed from between a rocker and pedestal but always keep at least one washer between the rocker and pedestal and between the rocker and spring. Always keep the original number of washers in the end pedestals. The spring wave washer next to the front and rear rocker may be transferred from one side of the rocker to the other for roller alignment but always keep a steel shim washer between the wave washer and the rocker. The spacing from pedestal mounting stud to valve center does not seem to be symmetrical from front to rear of the Spitfire head so while one washer may be required for instance, behind pedestal #3, two may be required in the symmetrical position in front of pedestal #2. I have set up the shim washers based on a sample head but yours may vary.
- 3) After achieving best roller to valve alignment, put the push rods in place and add a drop of oil in each cup. Lower the rocker assembly onto the head while aligning the push rods onto the adjusters. Tighten the four nuts on the pedestal studs evenly so that the rocker shaft is not bent as it is pulled down against valve spring pressure. Some valves will be opening as you pull the rocker assembly down. Shift each pedestal front or rear in the stud hole clearance for best roller alignment then torque the pedestal stud nuts to 26 ft/lbs. Then tighten the small hex socket cap screws on the end pedestals to clamp ends of the shaft.
- 4) Before adjusting the valves verify that your valve springs will accept the increased lift. Turn the engine until the valve to be tested is fully open then turn the engine one full turn so it is fully closed. Turn the adjuster in until the clearance is just taken up then tighten the lock nut. Turn the engine carefully by hand while watching the valve spring until the valve is fully open. Stop immediately if the spring bottoms. If your spring is nearly fully compressed at full lift you may want to test all the springs since valve lengths and spring tolerances may vary.
- 5) Adjust the valve clearances in the normal manner but add 6% for 1.55:1 rockers or 12% for 1.65:1 rockers to the cam manufacturer's recommended valve clearance. Torque the adjuster nuts to 15 – 16 ft/lb. **DO NOT exceed 18 ft/lb torque on the adjuster nuts.**
- 6) Check that clearance exists between the shank of each push rod and the head. The high ratio rockers position the top of the push rod a bit closer to the rocker shaft than the stock rockers. This can cause the push rod to hit the head and may require minor grinding of the head for clearance. This condition usually does not occur with the stock push rods but can occur with the larger diameter tubular push rods. See the photos on page two. Photo 1 shows the areas of the head where the push rods may interfere. Only three

are shown for reference but any of the twelve push rods may interfere. Photo 2 shows the area after grinding for clearance.

- 7) Turn the engine very carefully two full turns by hand while checking that none of the springs are binding at full lift.
- 8) Start the engine with the rocker cover removed and check that each rocker receives oil to the roller and to the push rod. If there is an insufficient amount of oil feeding from the rockers, an external oil feed line can be installed between the main oil gallery in the block and the $\frac{5}{16}$ " threaded hole in the left rear corner of the head. This line can be restricted to meter the desired amount of oil to the rockers.
- 9) Install the rocker cover.



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