

250 Triumph/BSA Rocker Arm Mods

As a professional Triumph mechanic during the early 1970's, I remember the 250cc singles very well. These machines were built by BSA, with some being re-branded to Triumph. Models included the BSA B25 and Triumph T25. They were easy to work on and fun to ride because the engine would rev up effortlessly. However, they were highly susceptible to valve floatation and subsequent valve train damage. And since these engines performed so well at high RPM, loss of compression from valve damage was something we saw all the time.

Damage Repair

To repair this problem, the first step is to remove the cylinder head and both RH engine covers to inspect the entire valve train. The cam followers (tappets) should slide freely in the engine case over their full length without binding, and fall out from the fully-lifted position under their own weight. A bent cam follower will bind at its extreme lift point. Bent tappets must be replaced.

The exhaust valve can easily be checked for leaking by holding the exhaust port straight up and watching the combustion chamber while pouring in thin solvents. A bent valve will let solvent gush by. A valve in good condition should hold solvent for at least 3 seconds.



Photo 1. Stock rocker arms and the compression release lug

Future Prevention

After replacing valves and lifters you have repaired the damage, but not the cause. The real culprit is that the valve train weighs too much to sustain high RPM. You could install heavier valve springs, but that would simply wear out the cam and cam followers. The best prevention method is to lighten the valve train's reciprocating weight. Most of the excess weight is found on the outer ends of the rocker arms. Repair requires an electric bench grinder and/or a 1" belt sander. It does not require a lot of skill, just steady hands, time and patience!

The idea is to remove weight from the areas of the rocker arms traversing the greatest distance. Therefore, weight near the rocker spindle is not nearly as important as weight out on the arms. The boss used for the compression release is a special target. BSA used a common forging to make these rocker arms, but after the mid-60's the 250's did not have a compression release. Therefore the compression release lug can and should be completely removed. See photo 1.

Work slowly and let the following photos be your guide.



Photo 2. The same rocker arms after modification



Photo 3. Note the smooth blended surfaces

Here are some hints and tips to remember:

- To retain full rocker arm strength don't reduce the height of the arm, only the width of the arm. The finished arms should be somewhat oval in cross-section.
- The reciprocating weight is more critical the higher you intend to rev the engine, so for simple street use don't get carried away.
- The more material you remove, the smoother the final surface finish has to be. For street use, rockers can be sanded smooth; for racing, rocker arms must be polished.
- Leaving generous corner radii greatly reduces internal stresses. Stay away from making any sharp corners or deep score marks. Blend all the surfaces together.
- When the rocker gets warm, stop grinding and drop it into a bucket of water. Work on the other rocker arm in an alternating, tag-team approach.
- To protect the polished push rod tip simply knock it out with a small punch before starting. It's not installed very tightly. You can easily press it back in using a bench vise.

- These rockers have a drilled oil gallery. Do not grind into the oil line. By inserting a drill bit into the rocker, you'll be able to visualize the oil hole location much better.



Photo 4. A drill bit shows the oil passage location



Photo 5. The finished rockers reinstalled in the box

When you're happy with the result be sure to wash the rockers with plenty of warm soapy water and blow out the oil holes with compressed air. The abrasive materials used for grinding will remove as much metal from the inside of your engine if you fail to clean the rockers thoroughly.

The modified engine will be much more responsive and never again susceptible to damage from valve flotation. See the "Rupert Ratio Unit Single Manual" for more information.

Happy thumping,
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