

How **NOT** to Adjust 2RZ Valve Clearances



This shim's case hardening has been machined off which allowed the cam to wear a hole in it.



The shim was so thin, the cam broke the lip off the bucket.



We would like to thank Geoff, from All Head Services, for this technical knowledge & photos. www.allhead.com.au



Causing the hardening to be worn off the cam lobes.



This bucket has been machined internally to allow clearance for the recessed valve.



*This is what a bucket should look like. Shims and buckets should **NEVER** be machined.*

All Head Services had a 2RZ cylinder head from a Toyota RZH103 HiAce sent in with an issue of the valve clearances closing up and the customer having to adjust valve clearances at very short intervals due to a misfire and loss of compression.

The valve clearance for this engine is a shim and bucket design, and it is relatively easy to adjust the clearance without removing the camshaft. The cylinder head was dismantled, and when inspected it was found that the valves had recessed into the head causing the valve tip heights to be out of specification.

This engine had been converted to run on LPG which commonly causes the

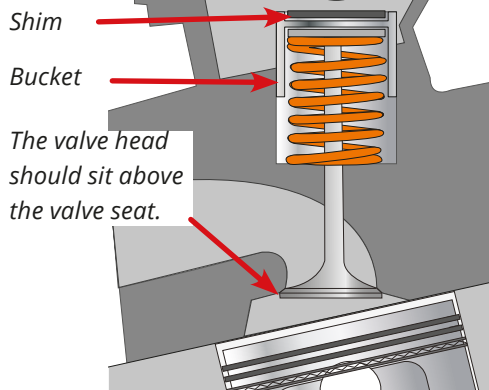
valves to recess into the head, which closes up the valve clearance. To correct the continual closing of the valve clearances, the owner had the shims machined down. Then, the next time they machined the inside of the buckets to gain some extra clearance.

Many engine components are case hardened which means that they have a very hard outer layer, but are relatively soft on the inside. Once this outer layer has been worn through, the components will degrade rapidly. In this case the machining process has broken through the case hardening and has caused the shim to wear through, damaging the buckets and has worn the lobes off the camshaft.

If the valve clearances on any engine continually close up there is usually an underlying issue and a vehicle being run with an out of tune LPG system can be a significant contributor. The cause of this must be investigated to stop further damage. 🚩

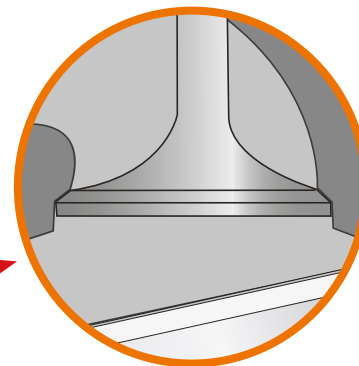
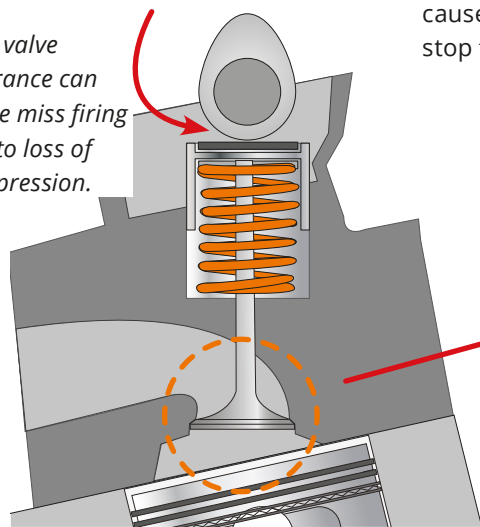
Correct Valve Clearance

Valve Clearances (Cold):
Intake 0.20 - 0.30mm
Exhaust 0.25 - 0.35mm



Zero Valve Clearance

Zero valve clearance can cause miss firing due to loss of compression.



The valve has recessed into the head causing the valve clearance to close up.

