

What's causing a rattling sound with an RV8 engine?

Andreas Gloor in Switzerland raised the question: "Are there members who experienced valve problems? More precisely who has experienced valve rattling as soon as the engine is heating up a bit? It sounded a bit like a 4 cylinder engine is running next to the V8." He provided a copy of a short report on this matter which was published in Sign Post, the Swiss Centre's magazine.

Problems with valves on MG RV8

A few years ago I had a somewhat strange experience with the engine of my MG RV8. One day I was waiting at a traffic light and I heard the sound of a 4-cylinder engine next to my V8. Strange. There was no other car standing nearby. I drove on and at the next traffic light I could hear the strange sound again. When I took the MG for a ride out of the garage again, everything was fine, but as soon as the engine was warm again, there was this strange rattling sound.

I took the RV8 to a workshop as I suspected that something was wrong with the valve train. It sounded to the mechanic that the valve clearance was too big. However, the V8 engine has a single camshaft and hydraulic tappets to compensate the valve play. So the hydraulic tappets were replaced and for a short time the problem seemed to be solved. Until, yes until the rattling started again. It increased to a really hammering noise.

In a further workshop visit the two cylinder heads were then removed and no defect was found. But there were **hard glassy deposits on the valve seats** and the valves were leaking. The valves and seats were reworked and also the cylinders and pistons were checked, but without findings. The problem seemed to be solved and for a while nothing rattled anymore.

But the joy lasted only two months and then the hammering noise was back again. Rocker arms and shafts were checked and a test run was made without valve covers, because there was the suspicion that something was wrong with the lubrication. Nothing. Only a **tar-like mass was found in the intake manifold and on the valve discs and valve shafts**. The question from where did it come? The workshop owners discussed the matter during a matter; but nobody knew what to do. The petrol tank was searched with an endoscope and the petrol filter was sawed open, but no residues were found.

I asked my mechanic if there were any rubber fuel lines that were dissolving. Answer: no. So it could only come from the tank. As a chemist, I know that there are deposits which are not necessarily visible, because they are gel-like or glassy. So I asked the mechanic to flush the tank but no brown or black residues or mucus were found. BUT: from then on the problem with the valves was gone.

Conclusion from the chemist's point of view

The MG RV8 had been in service in Japan for a long time and was operated with the gasoline available there. Now the MG was on the road in Germany and Switzerland for a longer time and the gasoline quality changed here: new additives and alcohol (keyword ethanol, E5 and E10). Possibly there were residues in the tank for a long time but they were quiet. The new additives and especially the ethanol slowly dissolved the dormant deposits and transported them through the injection system into the combustion chamber where they coked (tarry and glassy mass) and thus hindered the free movement of the valves.

Comments from Tony Lake

The symptoms reported suggest a loss of oil supply to one bank of hydraulic tappets, if the tappets are empty they clatter very loudly.

The blockage will be caused by quite a large object at the beginning in one of the galleries drilled the length of the block that supply oil to all the rotating and reciprocating parts. It seems to be able to move since the noise does disappear. Did the oil pressure gauge show a change in pressure? It maybe that since it is pumping against a dead end on one bank for a period that there is a sudden increase in pressure before the relief valve opens wider.

There is no history, so it might be that there has been a component failure in the past that left some debris. The debris must be located somewhere in the passages after the lub pump outlet, it might even be from a broken tappet, but it is hard to imagine what else could get in there.

In my experience this kind of complaint is not uncommon after a component failure. Unless oil galleries, sump, pipework and oil filter housing are cleaned properly another failure will occur. It often requires a complete teardown to account for all the failed bits.

Comments from Nic Houslip

Tony Lake's explanation seems to be most likely, but as an **alternative solution** the experience of a member at the last Aldon Dyno day may throw some light on the problem, as the member arrived with an RV8 that made an awful clattering noise, almost everyone suspected hydraulic tappet problems. On a dyno run it was down, if I recall correctly, to about 140BHP. The exhaust gas analysis readings indicated fuelling problems and then he mentioned he had **fitted aftermarket injectors**. Replacing these at a later date with correct OEM parts cleared the clattering tappet noise and returned the power to the correct BHP.

The condition of the combustion chambers and the valves in the attached pictures would indicate a slightly rich (* **see note below**), but different mixture in cylinders between banks, whereas we would expect them to be similar. As a **precautionary measure**, either replace with a new set of the correct injectors or if possible, take the old ones to a Bosch service centre and have them run a test on all 8. Then **check the injector rail for a loose part inside** that could temporarily block the fuel rail - an old injector grommet or similar.

The injectors are a Piezo electric crystal driven actuator, this opens the orifice very quickly and with great force (relatively). My suspicion is that **if there were an intermittent shortage of fuel pressure in the injector rail due to a blockage, the injectors may be noisy**. I would also suspect the fuel pressure regulator that maintains the fuel rail at a fixed pressure above manifold pressure (so the injection amount is accurately related to air flow) as this has a diaphragm and could be suspect and might give over rich running.

Footnote: replacing hydraulic tappets

When replacing Hydraulic tappets there is a requirement to check that the correct preload is on each tappet, although normally it is correct, but again might be worth investigating Searching on internet "Hydraulic tappet preload" will return several videos on how to do it. This is VITAL if the heads or Block have ben machined.

* **Note** - the mixture richness, carbon may be the results of not driving the car hard enough, the Swiss are very observant of speed limits and there are few motorways where you can drive hard, but it is essential to do so. RV8s tend to fail emissions at an MOT unless you drive to the MOT station via a motorway and have some decent acceleration periods to clear the cobwebs out - and bring catalysts to max working temperature.