

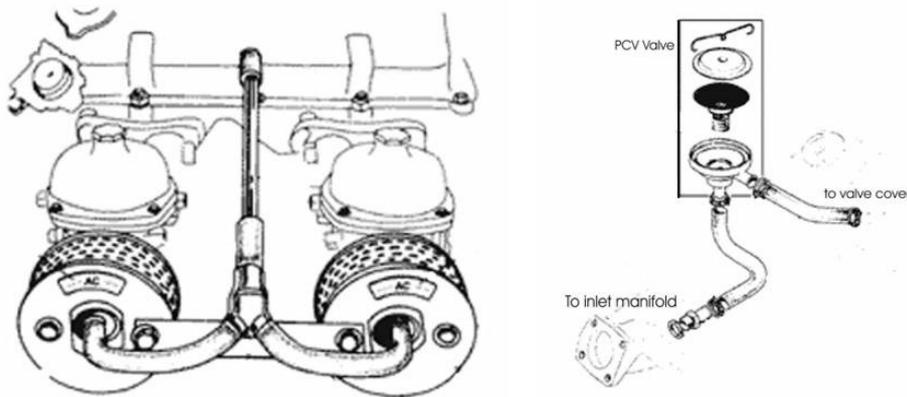
Crankcase Ventilation of the Triumph Roadster 2000 and how to improve it (Part II)

1960's state of the art

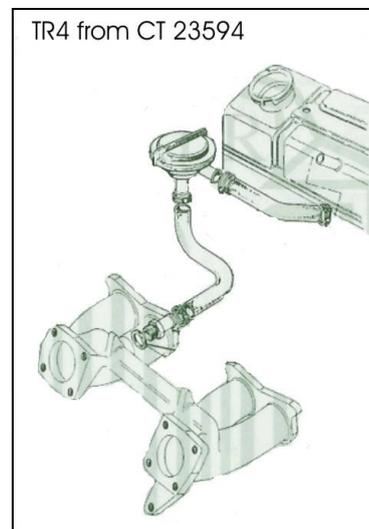
The control function of the PCV Valve described in Part I relies on the fluid flow through the valve and therefore this type of PCV is dependent upon the engine characteristics. It would need much trial and error to find the right one for the S4 Triumph Roadster engine.

However, when introducing crankcase ventilation in the early 60's in the TR4 model this ventilation system was based on a pressure-regulated PCV which is less critical to the engine characteristics because it simply limits the vacuum drawn in the crankcase independent of the actual fluid flow. This type of PCV has now become the standard on most motorcars.

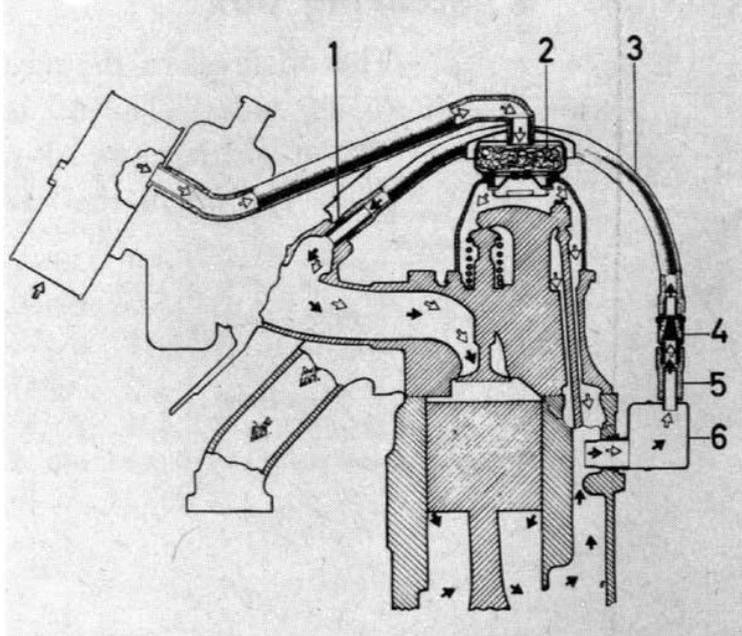
Below is the system used on the TR4 which, apart from the PCV, does in principle not differ much from the original Triumph Roadster 2000 system.



When compared to the Triumph Roadster 2000 crankcase ventilation system with an air inlet in the lower part of the crankcase (see Figure 1 in Part I) the fresh air inlet in the TR4 is in the valve cover (of course the inlet may become the outlet in case of a tired engine...). The direct connection for drawing off the fumes from the valve cover and taking it to the inlet manifold (black tubing in the picture relating to the Roadster 2000 below) comprises a PCV but it still lacks an oil separator (picture to the right for the TR4)



A similar system, but in which the fumes are being drawn from the crankcase, was used on the Volvo B18 engine as will be clear from the next picture.

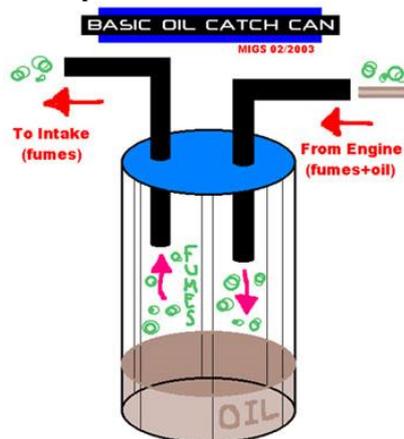


The conversion

It will be clear from the above comparisons that all that is needed for a conversion of the S4 engine to include a modern crankcase ventilation system is the addition of an oil separator to the PCV, which units are put in series between the valve cover connection and inlet manifold. Going from the valve cover the oil separator comes first and then the PCV with its connection to the inlet manifold.

PC Valves of the pressure-regulated type are easy to obtain, for example on EBay plenty are on offer. I used a VW-type used on Golf and AUDI engines. A multitude of different oil separators are also on sale on EBay (search for "oil catch" in EBay or Google).

Example of an "Oil Catch"



<http://members.shaw.ca/migsman/AE86info/PCVInfo/PCVInfo.html>

It was during trying out one of those that I found, in particular when using the car for shorter runs, quite some water accumulating in the separator. The accumulation of water made me abandon my initial idea of letting the accumulated oil flowing back to the crankcase, because also the water would then flow back into the crankcase. It would be better to just dispose of the accumulated oil-water mixture, which is in fact also done in most of the oil-catch devices found on EBay.

My first "Prototype" worked well but proved too big.

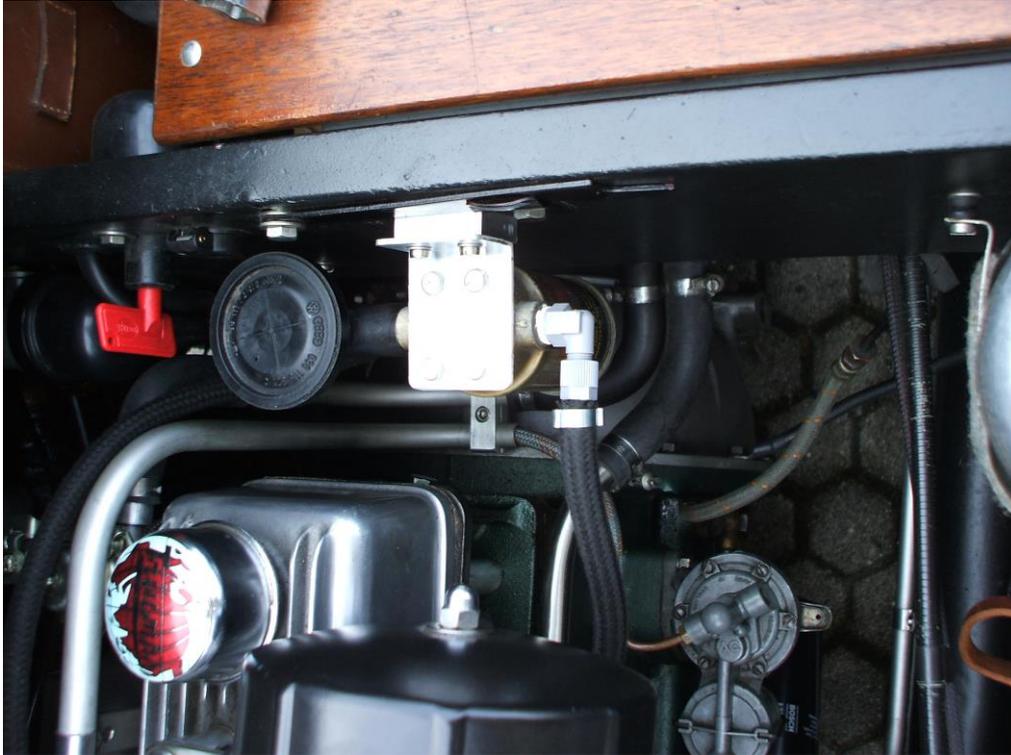


In an attempt to combine all the requirements in one device I therefore opted for a water-oil separator for a compressor also because it has a plastic receptacle so that you can see what is happening and it includes a tap for emptying the separator.

The following picture shows the conversion on my Roadster 2000, still in a somewhat provisional configuration but working fine!



This picture gives an idea of the system mounted in the engine bay.



Despite its small overall size the conversion works astonishingly well, as did the prototype I tried out last year. As could be expected only some minor adjustment had to be done to the carburettor because of the restricted air flow through the PCV and separator. In fact only the stationary setting of the air screw had to be altered. A positive side-effect of the conversion is that, because of the PCV, the amount of fresh air drawn into the engine is reduced. This results in less water vapour drawn into the engine and less oxidation of the oil in the crankcase.

Even after the short runs I made this winter, water and oil accumulated in the separator in small quantities which, because of the tap, is very easy to dispose off. Of course it would be more interesting to see what the conversion does this summer during a long and hot run. I'll keep you informed.

Best regards and good roadstering in 2008 wishes
Paul Alting van Geusau