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PAVE TESTING – draft extract from "MG RV8 THE DEVELOPMENT STORY" (research paper currently being finalised by authors Chris Allan and George Wilder, planned for publication by V8 Register – MG Car Club in 2017)

Pave testing

Early in the Adder development programme, Rover Special Products (RSP) had decided that the Chassis development car DEV3 should be subjected to a pave rig test, in lieu of "real pave" testing. In the early 1990's, Product Engineering only recognised a "real pave" as a "pass", and when they took over engineering responsibility from RSP in August 1992, in line with their normal practice, they added the 1,000 mile pave to the test programme.

Pave was a historic test started back with BMC to provide a structural accelerated durability test for the suspension and body. The 1,000 mile pave test was intended to provide the total number of peak suspension and body load inputs that would be experienced throughout the designed service life of the vehicle (100,000 miles). This meant that pave tested primarily body structure, suspensions, engine mounts and any other static component bracketry attached to the test vehicle. Movement imparted by the powertrain could also show whether hoses would rub/vibrate on other components and also whether they were of sufficient length. Damper and associated bushings failures were, within reason, acceptable. Pave was not a high mileage test for rotating parts such as engine or transmission, alternator, etc.

In the case of the RV8, probably the most significant issue which came to light as a result of the pave testing was the failure caused by the use of incorrect gauge steel for the steering rack mounting brackets fitted to the majority of the prototype cars (once the problem was identified, these would all have received replacement crossmembers). Pave was never meant to replace component rig tests, although over time component engineers realised that their parts would get a free test on pave so eventually pave became a sign off test for many mechanical component brackets and fixings.

Pave cars were normally painted white and both underseal and seam sealant, applied in the AB Paint Shop, were always requested to be deleted which made monitoring the body for visual crack initiation easier before micro cracks led to big cracks and before it was too late to prevent wrecking the body. Initially SDV204 was the main pave test car, hence the SDV204 vehicle build instructions stated "no sealer". All cracks would be reported to the responsible body engineer who would decide whether to allow the test to continue, or to repair, or just monitor for further growth. Sometimes they were just stress relief cracks and would remain constant size.

Real pave testing was carried out at MIRA which offered a pave and water splash/trough facility. The track was based on real European roads (measured and reproduced) and reproduced real life failures. The road surface consisted of granite setts embedded in concrete and was approx. 2.5 km in length consisting of three straights and an "S" bend. There was a water splash c. 70 metres in length which had a nominal water depth of 100mm. (this could be varied for specific tests).

Pave was set up to run at speeds that avoided any crashing through of the suspension due to metal to metal contact at bump stops as these would not be typical customer loads that occurred as frequently as every lap of the pave cycle. Depending on the specific vehicle model, the pave test was carried out between 25mph and 35mph. Initially the "worst vibration" condition within this range was identified and then the test proper carried out at this speed.

The other limitation of driven pave over rig test was vehicles, such as the RV8, with low ground clearance ground out more easily than saloons, etc., causing exhausts to fall off, sump and petrol tank damage and unrealistic load inputs to the body leading to premature failure.

It was essential to ensure that dampers were maintained within set temperature limits, otherwise they would weaken and cause crash through. Dampers on track pave were cooled via the water trough drive through and as many cooling laps as were required to get the dampers back to the working temperature window (maximum 90 degrees outer body temperature as specified by Koni, the damper manufacturers). For this reason water would often enter the interior due to lack of sealant (pave vehicles would not be fitted with carpets), this would not be reported as a failure. The cooling laps were not included in test mileage, only pave laps with inputs counted toward the test as recorded on a mechanical counter mounted in the car. To limit lost damper cooling time, Rover introduced artificial water cooling to try to keep the dampers "alive". The cooling method selected was on a model by model basis e.g. water cooling didn't work on hydrolastic/gas suspension, and although the method used on the RV8 is not known for certain, it is likely that in line with most models fitted with telescopics; foam was wrapped round the bottom two or three inches of the damper and a windscreen washer/pump used to constantly spray them with water. The dampers were thermocoupled (araldited and taped to the outer body of damper) with a digital readout...

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