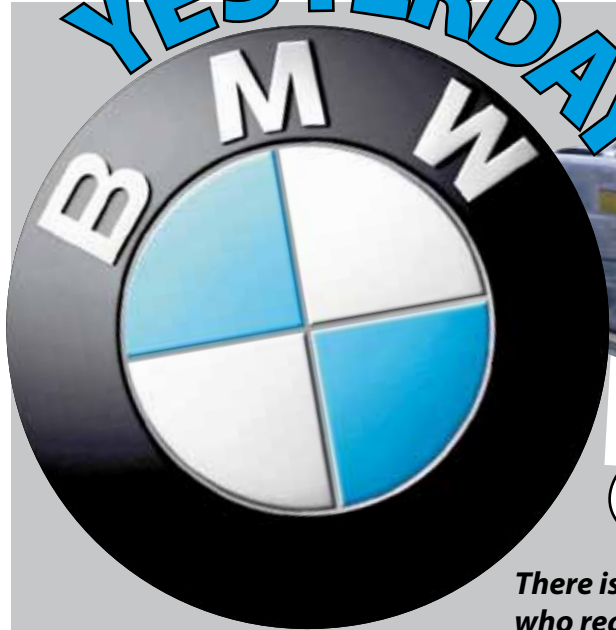


YESTERDAY'S HERO



There is a steadily increasing number of riders who really rate the air-head BMW boxer twins. Why? Duncan Cooper explains this. Part Two: MoT-time, and The Intermittent Fault...

Photos by Duncan Cooper



To get to the MoT I needed the bike to run properly. This was largely achieved by rebuilding each carburettor

In the first episode I described the circumstances surrounding my purchase of a forlorn BMW R100 built in 1981, my intention to go touring on it with more modern machinery and my efforts to get it to run properly. Having succeeded in getting the engine to run well enough, largely by rebuilding the carburettors, my thoughts turned to getting an MoT to allow some proper test runs and thus discover what else needed attention.

Before the MoT I thought there were maybe one or two jobs I should do to present the bike in a good light to the tester. The horn didn't work, so I replaced that with a 'universal' item from the local motor-factor. To make a good impression, I decided to clean and paint the subframe which, like the rest of the steel frame, came with a brushed black-over-rust finish. Unbolting the frame and using a wire brush in an angle grinder got the old paint and rust off pretty well, but putting paint back on didn't go quite as well.

I ran out of Halfords' spray paint and tried finishing the job with spray Smoothrite instead, discovering that these paints react quite badly. Despite this the subframe looked much better, so I decided to move on. To neaten up the wiring I cut out the cables to the non-functioning heated grips and covered the exposed element with insulating tape. I even went the extra mile and glued

the cracked lens of the rear light back together.

Possibly not an MoT fail, but very disconcerting, was the action of the centrestand, which made the bike lurch alarmingly to the right, away from me, as I heaved it up. The two legs of the stand curve round at the ends, a bit like short skids, so as you pull the bike up and back it rolls smoothly up onto the stand. Or at least that's what Mr Fritz intended. Unfortunately the tube sides which rest on the ground must have rusted away and someone had welded on patches. Rather chunky patches, with the left-hand one standing out more than the right. The tang was also missing.

On some types of bike the tang is so strong that you can push down on it as you pull the bike onto its centrestand, but not these BMWs. With these the tang is just to lower the stand, and then you put the ball of your foot on the end of the stand leg to heave the bike up. If you press down on the tang it will probably come off, as seemed to be the case here.

With a loop of wire and a screwdriver used as a 'T' handle, I unhooked the muck-covered springs and removed the bolts through the stand pivots. A process of adding weld and grinding made the heights of the patches more even and smoothed out the step between patches and the original tubing. I even tacked on a new tang. When everything

was back together and the pivots greased, it was much easier to get the bike up, and it seemed less of a mind to throw itself to the floor.

As I intended to ride to the MoT station, I decided that I had to replace the engine and gearbox oils. They were likely to be pretty old, considering the state of the rest of the bike. For this to be a fresh start, I also needed to replace the oil filter, which lives under a cover on the right hand side of the crankcase, very near a frame tube. Now this frame tube isn't a problem, but if engine bars have been fitted, which attach to the frame, the right-hand engine bar stops the cover coming off. This, in itself, should be no problem as there are just two clamps and a large nut holding the bar in place. Regrettably, I seemed to be correct in my assessment of when the oil and filter had last been changed, as the clamp bolts, exposed to the worst of the weather and road grit, had seized solid long ago and sheared as I tried to undo them. On the bright side, I'd got the engine bar off so could replace the oil filter and oils without obstruction. With one engine bar gone I can still carry on...

I set off for the testing station, on a wing and a prayer, and the five-ish miles there went fine. I took it pretty easily, as seemed wise, but it was really quite a pleasant ride, with the bike completely changed from when I'd had to fight and coax the thing just to get round a car park. The MoT test itself also went fine until my nerves caught me out when told to apply the rear brake and, unthinkingly, I pressed down with all my not inconsiderable weight. There was a 'ping', the sound of a ricochet and the pedal went limp. The cam operating lever on the rear drum had broken.

The end of this lever is pulled by the operating rod and has the form of two rings, side by side, with a trunnion sitting in these rings. The threaded end of the brake pullrod goes through the trunnion and the winged nut on the end of the rod butts up against the trunnion, so when the rod pulls the lever is moved. What had happened when I bounced on the brake lever was that the front half of each ring had sheared off and disappeared into the depths of the shop. A flashing runs along the centre-line of the alloy lever, creating a potential weak point at the tips of the rings.

From the remains of the lever it looked like corrosion or fatigue had caused twin cracks to form along the flashings, so the force on the cam lever wasn't being contained by two rings, just by two 'hooks'. The excessive force ➤



Checking the bike showed that I'd need a working horn before trying for an MoT, so I popped down to the local motor-factor and got this 'universal' one



Heated grips had been fitted, but the covering had worn through to the element and they didn't work. For a slightly neater finish I wrapped insulating tape around them, running out before quite finishing the left one



The curved tubes allow a smooth lift up onto the centrestand. Unless they have rusted through and had chunky patches welded on...

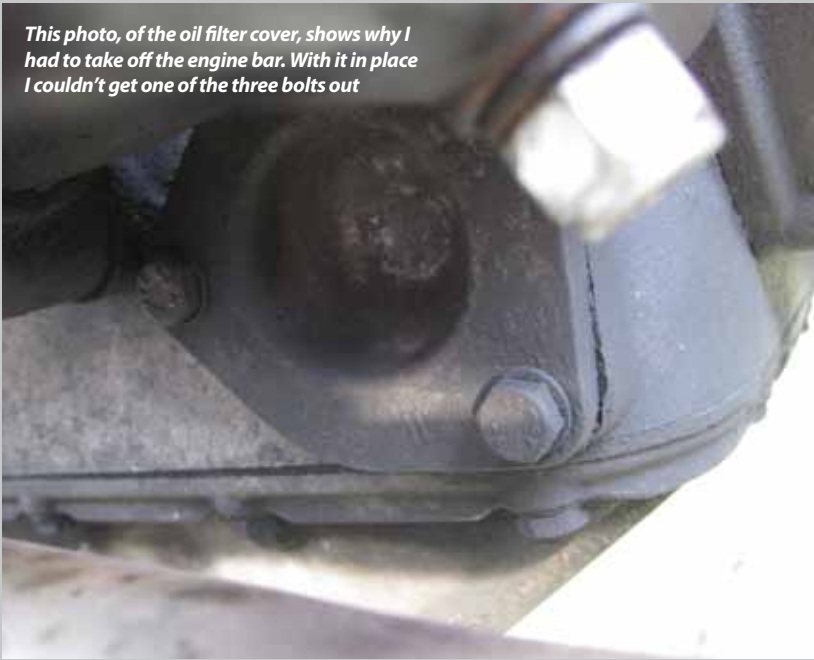


This is the bit of metal rod I welded on as a tang. The picture also demonstrates that one thick coat of paint is not as good as two light ones



The bolts (or maybe they're studs?) on the right-hand engine bar clamps sheared when I tried to undo them. This clamp's on the left-hand bar and the threads look OK. I'll leave it be for now though!

This photo, of the oil filter cover, shows why I had to take off the engine bar. With it in place I couldn't get one of the three bolts out



This is the brake cam operating lever that broke during the MoT. Those 'hooks' are meant to be complete circles...

I'd applied had sheared these off at the base. Not the best thing to happen during an MoT, but better there than on the road. The simple design of the brakes, and an understanding tester, allowed a repair sufficient to pass the brake test and with no other problems the bike got an MoT certificate. Yeh!

I now needed a permanent fix for the back brake, so was soon off to Motorworks, yet again, to check out their selection of secondhand cam levers. The one offered showed none of the marks of age evident on the failed original, even though they must have been made at more or less the same time. Maybe the replacement came from a bike that wasn't run through the winter – many of the bikes on the Motorworks 'Just broken' webpage look better than this R100.

I look at these pages with very mixed feelings. I understand that because those bikes have been broken it's easy for me to get parts for mine, but it seems such a shame, especially seeing the /5's and /6's as some look eminently fixable to me. But then I am a sucker for a lost cause.

Anyway, it maybe of interest to note that the failing alloy of the original cam lever doesn't seem to be a one-off. I've not undertaken a comprehensive study but I have seen other examples of serious alloy corrosion – a kind of

de-lamination – of certain peripheral alloy components on BMWs of this age and weather-beaten condition. I don't mean the big things like the engine, gearbox, bevel drive or forks, as beneath the weather staining, surface corrosion and scars these all seem sound enough, even on this battered and neglected old R100. But the small components (the brake cam lever, brake pedal, handlebar clamps, gear pedal and the clutch lever at the gearbox) all seem to be made of a different alloy, one more prone to serious corrosion if not kept clean and protected. Of course the cam lever that started me off on this had lasted for thirty years, a service life that could be considered reasonable if we weren't talking about an air-head BMW, a bike built for eternity in most other ways.

Moving on... With an MoT I could now do some proper testing, so decided to combine a test run with an errand across the border for more parts. There was snow on the ground but I had booked a touring holiday for Spring so had to get on with checking the bike out by getting a good few miles under its wheels. I'd need to do about 3000 miles on the tour so I needed to build up some confidence in the bike.

Getting to Meltham and back looked an easy enough first step, but it was with a mix of trepidation and excitement that I eased the BM off the kerb, the



Replacement for the broken cam lever. It's secondhand but shows none of the original's corrosion



I've seen significant corrosion of peripheral alloy components on other BMWs. This is the brake pedal on my R80. That notch on its lower side shouldn't be there

fork gaiters wheezing as the front wheel stepped down onto the road. I live about a mile from a motorway junction, so the BM was pitched straight into doing motorway speeds for about three miles of the M62 and then another three of the M627 before going through Oldham and being tried out in urban traffic.

After Oldham the road gets much better as it climbs up and heads across Close Moor. I treated the bike gently, but it seemed more than capable of moving with the traffic. On the motorway I'd fully intended to just sit in the slow lane but it wasn't long before the speed had drifted up and I was overtaking.

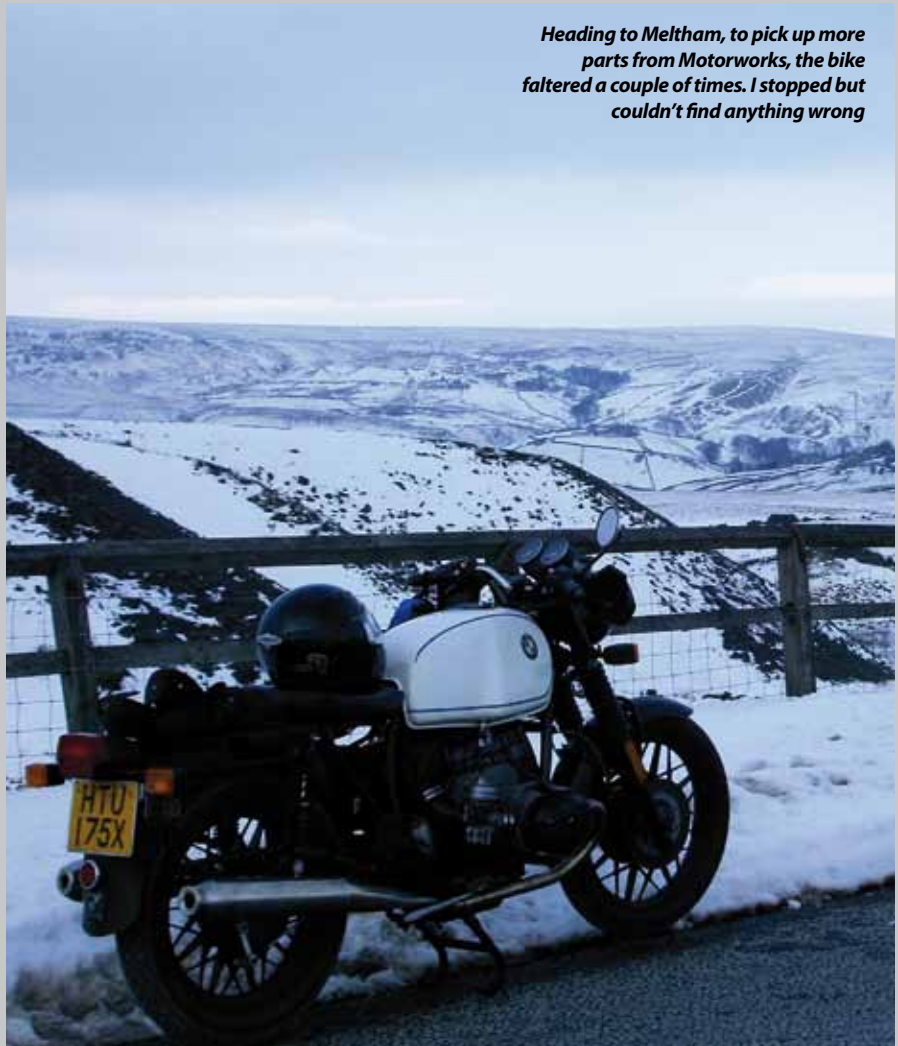
Heading across bleak moorland, pretty much where the road is crossed by the Pennine Way, the bike slowed and then picked up again. It did this a couple of more times. First I wondered if the engine was losing power, so I pulled in the clutch and blipped the throttle but the engine responded just fine. I stopped to check things out, starting by pushing and pulling the bike, but it rolled freely. Up on its centrestand, I turned the back wheel and then spun the front one. Both seemed fine with no foreign objects wedged anywhere and the brakes didn't seem to be binding. I tried wagging the wheels but couldn't detect any play. I wondered if all the rust coming off the iron disks was somehow causing the brakes to bind, but knew this didn't seem likely. I set off again and everything seemed fine so, taking it very easy, I went and picked up the parts before heading home.

Fixing an intermittent fault is very perplexing as it rarely manifests when you are in the back yard looking for it. It's out there somewhere, out on the roads, like a phantom choosing its moment to strike.

I decided to clean up the brake callipers and found that they were indeed covered in orange rust dust, the notches in the pads being packed with the stuff. I bolted the callipers back on and spun the wheel. It spun freely, but it did that before I cleaned the callipers up.

The bearings were another suspect for whatever made the bike falter out on the moors, so I gripped the front wheel, across its diameter, and shook it to try and discern any play or any resistance as the wheel was turned. There was none in the wheel bearings but I found some in the head bearings – though this was hardly going to make the ➤

Heading to Meltham, to pick up more parts from Motorworks, the bike faltered a couple of times. I stopped but couldn't find anything wrong



Horrid looking iron disks have been fitted that shed a lot of rust. In case this was somehow causing the brakes to bind I cleaned off the dust round the pistons and pads

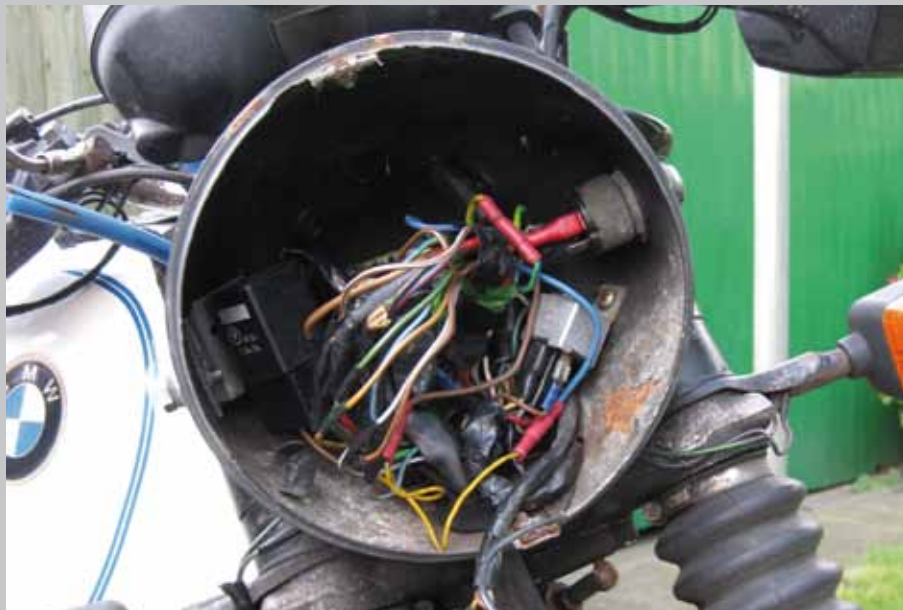
bike falter. This had appeared since the MoT (I checked them myself beforehand) so they must have loosened up after a bit of use. I tightened up the head bearings and then put the bike away until the next weekend. I also put the intermittent fault away in the back of my mind.

On the next test ride I got no further than the end of the driveway before everything went dead. The engine cut out and the instrument lights winked out. Now, the ignition key goes into the headlamp bowl and I know there's quite a lot of the wiring loom inside the bowl, so I suspected that my turning the bars, and hence the headlamp, at the end of the drive had pulled something loose. I turned the bars from lock to lock but didn't get a flicker from the instrument lights. I waggled all the wires I could see going into the bowl but to no effect. I pulled off my helmet and gloves and shoved the bike back behind the house for a closer examination.

With the headlamp removed, the hacked-about state of the wiring was revealed. It looked like someone had wanted to remove the headlamp and bowl from the machine but hadn't wanted to disconnect the wiring connectors. Instead they'd cut all the wires and then just twisted them back together again to re-connect. Under the loose and slimy insulating tape the twisted strands of copper had oxidised, increasing resistance and explaining the early signs of charring evident.

I spent an hour with wire stripper, soldering iron and insulating tape doing worthwhile work, but still not getting any signs of life in return. In despair I sadly searched out my multi-meter and discovered that there was no power to the ignition switch, so the fault must be upstream somewhere. I had to face the fact that I needed to look up the wiring diagram.

After puzzling over this for a while, I noticed that the power from the battery goes through the starter relay before going on to the ignition switch. I found this relay under the tank and also found that a wire was hanging loose, having corroded through just before the relay spade connector. With a new spade connector crimped onto the end of the wire and pushed onto the relay, the ignition was back on and the bike would run once again. By this time, however, there was no time to go for a ride so the BMW was put away again. The next chance I got, I decided to head for the Peak District using the M60 to nip round



Groping blindly for an electrical fault, I looked inside the headlamp bowl. It wasn't a pretty sight!



Although the hacked about wiring in the headlamp bowl benefited from some attention, the electrical fault was actually hiding here, under the starter relay

Manchester. Completion of the final section of this ring road a few years ago has made it much easier to get to this national park from my house and it's now one of my favourite destinations.

By this time it was about a month until the holiday I'd booked and, motoring round the M60, I wondered to myself how I could build the miles up quickly to check that the BM was now up to the job. I supposed I could ride around and around the ring road. Not long after this thought and still on the motorway the bike faltered for a moment and then picked up.

It seemed the intermittent fault was back, so I moved to the slow lane and dropped the speed to 60mph; not really all that slow but it seemed really slow on a motorway. The falter

came and went a number of times and I was sure it must be something up at the front as the forks dived a bit each time. I peered at the front wheel as best I could but couldn't see anything wrong.

Though keen to force the underlying fault to show itself, I also knew I should stop. I looked at the hard shoulder on the left and as I did so I glimpsed something silver fly out of the left-hand side of the wheel hub. The front wheel was suddenly shaking like a flag in a stiff wind, the bars too. I gripped the bars tight and pulled on the brake lever but couldn't get it back. Through my rattling visor I saw a concrete bridge column looming ahead.

Can I stop with the BM still upright? Do I die in a ditch? Will I have a nice holiday? To find out, tune in next time! **RC**