

FIVE ALIVE! Revitalising an old Boxer

Part Two: BING CV CARBURETTORS ON AN R60/5

Mike Fishwick

When the 'Five' series was introduced during late 1969, very few parts were carried over from the preceding Earles Fork range, such as the handlebar switchgear and – in the case of the two smaller models – the Bing slide carburettors. Perhaps these, too, should have been consigned to the dustbin of technical history, but they were to linger on until 1978 in R60/7 of the 'Seven' series.

Mike Sherlock's R60/5 had all the usual problems associated with old slide carburettors, with wear of the slide and body making the throttle action very heavy and the idle speed variable. Mixture adjustment at idle was erratic, and retention of accurate throttle synchronism all but impossible. When cold, the absence of a choke made pulling away a rather problematic procedure.

It was obvious that new carburettors were required, and rather than use the popular option of new Mikuni slide carburettors, we decided to fit a pair of used Bing 32 mm CV items.

At first glance this choice may appear strange, for the original carburettors were of 26 mm bore, and a smaller type such as the 28 mm size found on the R45 would seem more appropriate. A CV carburettor will, however, work well on a wide range of engine sizes, and the 32 mm type is more readily available.

I was also aware that such a modification worked well, for it had been fitted by BMW to several hundred R60 models owned by the Greek Police, which usually refused to start on hot days! This was due to the carburettors absorbing heat from the cylinder heads, and boiling the fuel in the float chambers. This filled the carburettor's jet systems with vapour, so causing pinking while running, and preventing hot starting.

We had first-hand experience of this problem during a ride to Budapest for the 1986 FIM Rallie. Neither John Coleman's R60/7 nor Roger Pasoe's R90S would start after lunch, until we realised the cause, and first poured half a bucket of cold water over each carburettor! In Budapest we learnt of the Greek police problem from BMW engineer Harald Schenk, John carrying out the modification on our return and being very satisfied with the result.

The basic cause is that Bing (and Dell'Orto) slide carburettors fit tightly onto the cylinder head inlet stub, their only protection from heat transfer being a thin plastic sleeve which makes only a token attempt to stem the flow of heat. By contrast, the CV carburettors are joined to the cylinder heads only by a rubber coupling, with no heat-conducting medium between them.

This, and the ability of a CV carburettor to provide optimum fuel atomisation at any throttle opening meant that their use had great appeal, being (compared to the Mikuni) made of better quality alloy and also preserving the Teutonic appearance. Other factors were their freedom from mechanical wear, and my familiarity with their settings and adjustment, not to mention a substantial saving in financial terms!

The first requirement was to design some new inlet stubs to match the 32 mm carburettors to the R60 cylinder heads. These were beautifully manufactured by SW Section member Don Rolling.

The carburettors were cleaned and rebuilt, using new needles, needle jets, and float needles etc. to the settings used by the R65. This means 45 pilot jets, 145 main jets, and 2.64 needle jets, with the needle fitted in its number 4 (highest and therefore richest) position.

At this point we found that the 'pattern' diaphragms Mike had purchased were made of a rather stiff plastic compound, rather than the very flexible nitrile rubber items originally fitted. In this case they were sufficiently stiff to hold the pistons at full travel, and so were replaced by genuine BMW items – at a price! We were once able to buy diaphragms identical to the originals at about 50 pence each, as spares for the Stromberg 150 and 175 CD carburettor used by Rootes, Triumph, Jaguar and SAAB cars, but these have now been consigned to history.

Removal of the old inlet stubs gave no problems, a Stilson wrench being applied to them while the heads were still hot. The new stubs were given a coating of Loctite 245 to seal the threads and prevent them becoming loose.

The only problem encountered in fitting the CV carburettors concerned connecting their inlet elbows to the air filter, as the 1980 model R80 elbows we had obtained were the usual tight fit. The problem was easily resolved by simply cutting away the enlarged section intended to fit over the air filter intake ferrules. The elbows were then joined to the air filter by rubber couplings, in the same manner as is found on a post-1981 model. They are therefore easier to fit, and also have the advantage that the carburettor is mounted on rubber at both ends.

We had decided to use the 1981-84 type of throttle cable assembly, in which the twistgrip operates a single cable, joined to separate cables from each carburettor by a junction box. On both my 1981 twins I found that while the cable running around the steering head stretched appreciably, the individual carburettor cables did not, so enabling excellent throttle synchronism to be maintained for thousands of miles. Why BMW reverted to twin cables in 1984 has always been a mystery to me. The single cable was connected to the original twistgrip in place of the usual lower cable, and the upper cable entry sealed with silicone rubber.

The R60 carburettors are not fitted with chokes, cold starting enrichment being provided by the time-honoured means of 'tickler' buttons to depress the floats and so increase the float chamber levels. We therefore obtained a pre-1981 choke lever, which mounted to the side of the air filter housing, as was used on the larger models. This control is typical of BMW and Megura at their best, moving each solid inner cable in a straight line by means of individual rack and pinion gear drives.

After fitting new fuel pipes and setting the float chamber levels – using the point at which fuel just begins to drip as the datum – we were ready to go. The engine started at the first prod of the starter button, then the carburettors were adjusted to give a slow and reliable idle, with an even pickup. As with the rest of this conversion, it was so easy that we began to wonder if we had missed something!

On his first ride Mike was amazed by the ease with which the engine now pulled at low speeds, the increased power at higher speeds, and the 'feel' that somehow he was riding a newer, bigger, and generally better machine.

These – and other less obvious benefits – are due to the maintenance of a high air velocity beneath the carburettor pistons, providing optimum fuel atomisation and also imparting the incoming charge with a high degree of turbulence as it enters the combustion chambers. Unlike slide carburettors, in the CV type this velocity is unaffected by excessive throttle opening or falling engine speed.

This results in improved fuel consumption and virtual freedom from pinking, not to mention the destructive high-speed detonation to which the R60 engine is so susceptible. This problem is due to a combination of poor atomisation, low turbulence, and the high compression ratio (9.25:1) of these engines. In extreme cases it can cause severe erosion damage to both pistons and cylinder heads, particularly in the lower areas of the combustion spaces.

The R65 settings also contribute, as the original carburettors provided a mixture which was excessively rich at the best of times, even without considering the effect of worn needles and needle jets. The R65 settings, incidentally, are also shared by the early R80G/S and R80/7 models, being the basis for their fabled blend of performance, economy, and smooth running.

These settings will provide similar advantages to the R45, and the later R80 variants, including the Paralever R80GS. My friend Dave Pearce, for example, found that his Paralever GS improved its fuel consumption from 38 mpg to 50 mpg, had improved throttle response, and also pulled better throughout the range.

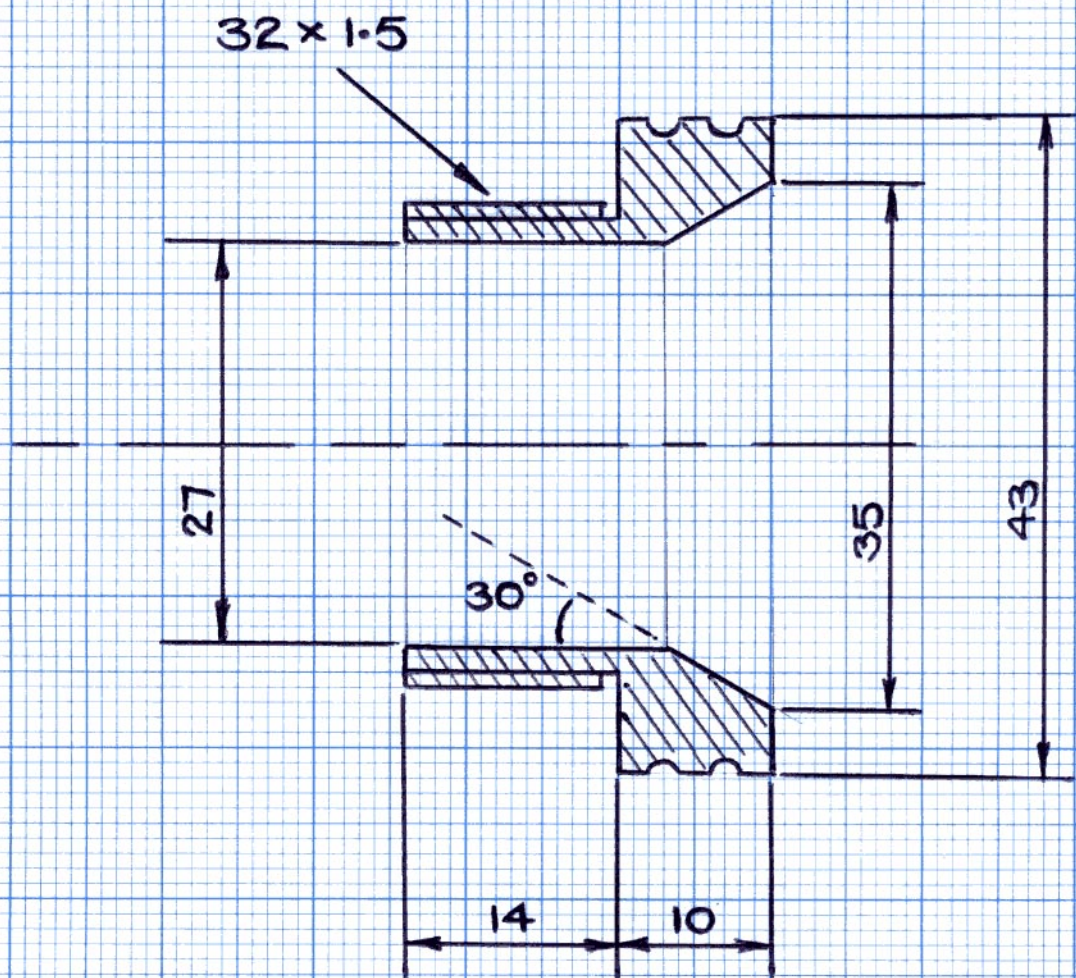
The R50/5 would also benefit from this modification, and it is highly probable that the 'self adjusting' nature of CV carburettors will permit this smaller engine to also operate on 32 mm carburettors. The R45, for example, runs very well on R65 carburettors, although this is due more to their leaner settings than the larger 32 mm bore. The R45 28 mm carburettors would also suit the R50/5, and in either case the R65 settings would again be suitable, but with a reduction in main jet size to 123, or perhaps even 105.

This modification is certainly worth adopting, and although some enthusiasts may feel that it degrades the neo-classic nature of these machines, we thought that the appearance had been enhanced by the CV carburettors, due to their peculiarly BMW appearance. For those who are more concerned with originality I would suggest use of the older CV carburettors, on which the vacuum dome has a square flange and is retained by four screws, so following the appearance of the R75/5.

Regardless of personal views, one thing is definite – Mike's 'Five' is now alive!

Photographs:

- (a) Original slide carbs.
- (b) Inlet stubs being removed.
- (c) CV carbs in position.



ADAPTOR STUB TO FIT 32MM BING CV
CARBURETTORS TO R60/5 IN LIEU
OF SLIDE CARBURETTORS