

J2 TECHNICAL ARTICLE

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VALVE TIMING - THE GREAT J2 LIBEL BY MIKE HAWKE

FACT. The J2, when tested by "The Autocar" in 1932, covered a flying quarter-mile at 80.35 m.p.h., (issue of 5th August 1932). A top speed of 82 m.p.h. was also reported back to Abingdon.

The sensation of this achievement may not be readily appreciated these days when almost any new car on the market can top 80 m.p.h. and the ability to exceed 100 m.p.h. is commonplace. In 1932, many cars of sporting character having engines of two or even three litres had top speeds of about 80. That speed was *fast*. The equal feat today would be if a new M.G. were to be introduced which could beat some models of Lotus and Porsche for top speed.

FACT. Many J2s could not attain this speed in practice. The regrettable slothful tendency may have been quite widespread among early examples of the model and some cases were very severe. The well-known trials driver Austen May bought a J2 (OC 1741) and had this to say in his book "Wheelspin":-

"It is ancient history now that the initial batch of this highly successful, and affectionately remembered little sports car suffered more than the average number of "teething" troubles, while there was, in addition, a conspicuous and most disheartening lack of the anticipated high range of performance. While being road-tested by the leading weekly motoring journals the new M.G. had been found capable of a maximum speed in the neighbourhood of 80 m.p.h., but the sample that came into my hands had a hard struggle to reach 65 m.p.h."

Austen May was a well-known figure in the motor-sporting world. "Wheelspin", published in 1945, is considered to be a classic and has been widely read. That 65 m.p.h. figure has caught on. It has been quoted in many motoring references.

Another well-known motoring writer and an expert on M.G.s, Wilson McComb has written in "The Story of

the M.G. Sports Car", (now, in later revisions called simply "M.G.") adds a new dimension to the story thus:-

"Kimber made one grave error of judgement. He told Jackson to ensure that the first J2 Midget was capable of at least 80 m.p.h. before it was handed over to "The Autocar" for road test. Jackson did so, S.C.H. David duly reported that he had achieved 82 m.p.h., and a few days later the crankshaft broke. A lower compression ratio had to be adopted for the production cars, and for the rest of the J2's life M.G. were pestered with complaints from owners whose cars would not do what "The Autocar" had said they would."

Put these two stories together and you get the picture of a 65 m.p.h. snail specially hotted up to do 80 m.p.h. and spoof the press. This is quite a tall story but now appears to be accepted by the specialist press designed to cater for the enthusiast, witness the "Classic and Sports Car" for May 1984 (p. 97) where, in a potted description of the J2, it is said:-

"Good for 65 m.p.h. but an awful lot of people broke crankshafts trying to emulate The Autocar's 82 m.p.h. test figures, achieved with a specially tweaked press car!"

The bit that really annoyed me about this was that the car illustrated beside this passage was MY J2. The cheek!

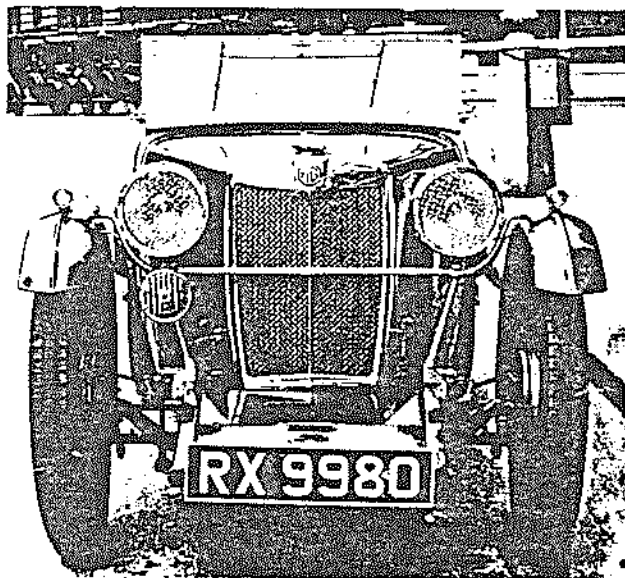
Gentlemen, this picture cannot be true. A moment's thought will tell us why.

Let us suppose that the top speed of a bog standard J2 really is 65 m.p.h. You are poor Jackson at Abingdon and the boss, Mr. Kimber, has told you that Sammy Davis is coming down to road test RX 9980 and 80 m.p.h. is required for the Great Man. The power increase needed to boost the top speed of the average unaerodynamic sports car of the early 'thirties by some 23% is between 50% and 80%, depending upon whether

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those pundits who say that power required increases as the square of the speed are right or whether it is those who favour the cube rule. Either way it is a bit of a tall order. Raising that compression ratio from that dizzy standard 6.2:1 is not going to be much help. With pump petrol commonly rating about 70 octane, any ratio over about 7.5:1 is going to call for a mixture containing benzole. Sammy would probably notice if arrangements were made to supply him with special fuel whenever he went to top up the car. Anyway, such an increase in c.r. would raise the power output by about 8%, good for about 2 m.p.h. and a bit better acceleration (see any text book on thermodynamics or the Triple-M Yearbook for 1973). Frankly this sort of thing is not the answer to our problem. The ONLY way to get the kind of power needed is to fit a blower. Again, we think Sammy Davis would have noticed this kind of modification.

But the test car did so 82 m.p.h. Therefore, hotted up or not, its real useable speed in standard trim must have been more than 65 m.p.h. In this respect we must remember that the car was in the hands of a most *The Prototype J2 (J0251) in the form as tested by Autocar in the summer of 1932. Note the non standard bodi parts.*



experienced and capable driver, it was at Brooklands which was much more suited to speed than most public highways of the day, and we have no word of whether the windscreen was folded flat, the method and accuracy of timing, if the times were two-way, etc.

We can come to a similar conclusion by considering the M-type. This car, boasting 20 b.h.p. compared to the J2s 36, having a similar size and frontal area to the J2 and therefore requiring a similar power to drive it through the atmosphere, was tested twice by "The Autocar" and the results reported in the issues of 28th. June 1929 and 25th. March 1930. On both occasions a top speed of 60 m.p.h. was reported. Using the "square" rule for increase of power with speed, the J2's top speed can be postulated at 81 m.p.h. Using the "cube" rule, the J2 should be capable of about 73 m.p.h. Again we have to conclude that a 36 b.h.p. J2 should be good for a lot more than 65 m.p.h.

Never mind that 82 m.p.h., what could have been the matter with Austen May's J2? He reports later in "Wheelspin":- ". . . my J2 Midget, now capable in full measure of giving the anticipated high range of performance, had been returned to me by the factory even before the "Land's End.", but he does not say what was wrong, or what had been done to cure matters.

My own thoughts centre around valve timing.

The valve and camshaft drive design of the o.h.c. M.G. engine is one of its strong points. Precise timing can be maintained up to very high r.p.m. There are no floppy timing chains to stretch, no flexing push-rods and timing can be adjusted to an accuracy as close as 1/2° of crankshaft revolution by adjusting upper and lower bevel gears vernier fashion even if keyways have been ruined and recut in a hectic 50-year life. But between the cam lobe and the top of the valve stem is a rocker of complex shape. Varying the position of rocker adjustment can alter the valve timing. If the rocker is to be in a position so as to allow the correct valve timing, then the valve stem must be adjusted for length. An incorrect valve stem length will give an incorrect rocker position and hence an incorrect valve timing.

How incorrect? This is a difficult question. The geometry of the system involves the eccentric bush

(which acts like a crankshaft), the profile of the rocker (two convex curved surfaces which act like a wedge of variable angle) and the movement of the rocker arm around the base-circle of the cam as it changes position across the top of the cylinder head. However, the indications are that the extreme variations on a J2 are—

Inlet opening up to 22° late or, at the other extreme, inlet opening up to 8° early.

Exhaust opening up to 18° late or, at the other extreme, exhaust opening up to 22° early.

These figures will be less for the large camshaft models.

Thus, it is possible for a J2 to be set up with a valve timing which is distinctly less promising than the M-type. See Fig. 1. Whilst I am not suggesting that an engine has ever been so badly set up that all eight valves were at these way out timings, the facility with which an engine can be robbed of power is easy to see. Then add the possibility of worn cams and rockers and even some non-standard bits, e.g. there are some "private" rockers about which are too long . . .

Now, the first M.G. to have rockers of this complex shape was the C-type with AB cross-flow cylinder head and the first production model to be so fitted was the J2. (See Infoletter 65 for a drawing.) It has been said that it took 200 man-hours to set up a racing cylinder head for the first time. True or not, Cecil Kimber could not afford to spend so much time setting up a production car's 'head when the showroom price was £199-10s, not even at 1932 wage rates. The need to get valve stem lengths absolutely right is stressed in the M.G. Service Information Sheet No. 7J dated April 1933. A method of getting it right using a toolroom gauge is explained. The

method could require the stripping and reassembly of the 'head several times and does not take account of tolerances which might exist in the camshaft and its bearings and the rockers and their shafts.

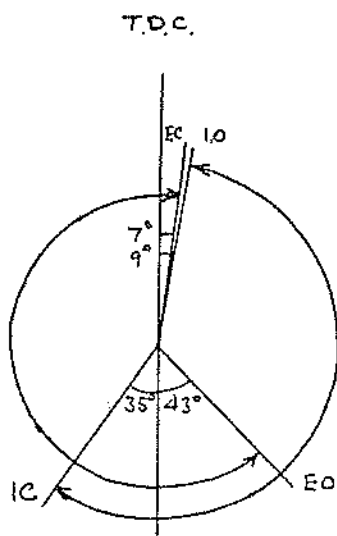
In the Service Information Sheet No. 13 dated June 1934 (which was reproduced in the June 1982 issue of Safety Fast) is described a different of adjusting valve stem length. It is quicker, takes account of all tolerances and variations and needs no special tools. The home mechanic with a 3-inch grinding wheel and an electric drill can easily achieve the required result.

The question is, "Were the teething troubles mentioned by Austen May really connected with the need in the works to develop a method of setting valve stem lengths quickly and accurately?" It looks a bit like it.

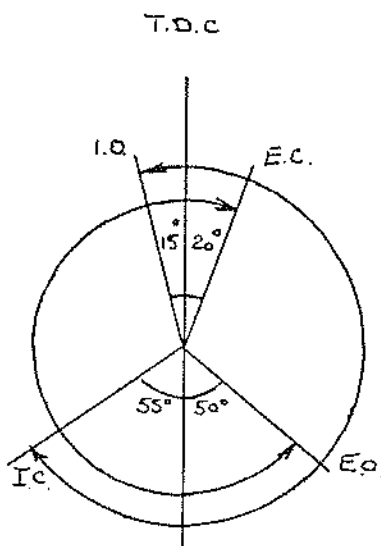
One can safely assume that the road test J2 was set up correctly, even if it took 200 hours to do it.

And so to the final question. "If one set up one's J2 with exactly correct valve timing, with full valve lift, everything else in the engine right and just a little on the loose side, no extra weight or built-in headwind such as twin spare wheels or spot lamps, no binding brakes, everything balanced, tyres well pumped up etc., could one hope to achieve 80 m.p.h. on the level?" 70 m.p.h. should be easily available; 75 m.p.h. will be, given a bit of a run at it (and confidence that the law is not looking) . . . but 80? If you go to Silverstone, just as Sammy Davis went to Brooklands, and get everything really warm you should see 5,500 r.p.m. in top – not on the straight so much but more likely on the run to Becketts. At that speed they purr.

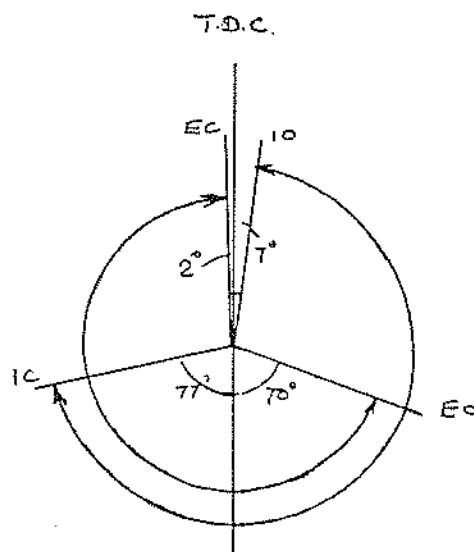
65 m.p.h.! Bah'.



M-TYPE VALVE TIMING



J2 VALVE TIMING



POSSIBLE MIS-SET J2 VALVE TIMING !!