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# Classic BRITISH TRIALS BIKES

Pre-1965 four-stroke trials irons –  
AJS through Velocette



BY DON MORLEY with Foreword by Ralph Venables

From: "Les Smith" <les.smith1@n...>  
Date: Tue Jan 29, 2002 7:57 pm  
Subject: Re: [AJS&M] Scrambles frame info?

Christian and all

I have contacted Don Morley and what a nice man he is. However despite his doing a lot of free work for various one make clubs he is not keen to have the book scanned for this groups use. He apologises but has had so much of his work plagiarised that he says even restricting it to our group leaves it potentially to be misused by someone. He is now semi retired and finds it galling to see his words and photographs used with out consent and credit. He appreciates I/we are not like that but.....

However the GOOD news is the call today was timely, as he has authorised 50 copies to be reprinted and they will be available any day now. This is of course the 3rd edition version and will be in softback. He is selling these from his home address at what is cost to him at £24 including postage and packing to anywhere in the world. This is obviously generous in itself.

The other good news is you are the first to know of their availability. So all you mud plugging guys who want a copy get your orders off to the address below.

Sorry to those of you having bought a second hand copy on Ebay at up to twiceas much. C'est la vie!

Also Don has confirmed that he is not able to take credit card payments. It would be nice to mention the group as the source when ordering.

Orders to:

Don Morley132.

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Les Smith

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## Foreword by Ralph Venables

As the owner of two classic British motorcycles, Don Morley's book has provided me not only with a great deal of pleasure but with behind-the-scenes factual information which will prove invaluable.

One of my bikes is a 16C 350 cc AJS (from the final batch of six assembled by Tom Arter in April, 1964), the other is one of the 250 cc Greeves Internationals made at the Thundersley factory in time for the 1965 ISDT.

Of the two, it would be a glimpse of the obvious to say that it is the Ajay which holds-for me-the greater appeal. Here is the perfect example of those classic British trials models upon which Don Morley has turned his spotlight in the ensuing pages.

Like me, Don has little or no interest in two-strokes. But his regard for four-stroke trials machines from the period 1946-1965 is nothing short of absolute adoration. Not a blind love, however, but an appraisal based on technical knowledge second to none. And, of course, on personal experience as a competitor.

In researching information for this book, he spared no effort to obtain first-hand accounts from factory mechanics and riders--and Don has a knack of unearthing the true facts from beneath an obscuring pile of publicity rubbish.

In those days, there was an acute need to promote the sale of trials bikes at a time when the British motorcycle industry was ailing. And for the same reason there was a need to cover up

dubious facts which would have discouraged the public from spending hard-earned money on so-called 'Works Replica' models.

Don pulls no punches. After some 20 years, the truth has been told about the wrangles which went on in the factories--about the crafty mods carried out by the jockeys when they were dissatisfied with their machinery. Allan Jefferies was not known as the Artful Dodger without, good reason !

But Morley's book does a great deal more than reveal home truths. It furnishes real enthusiasts with a wealth of valuable information on how to fettle an aging machine--how to bring a bike up to genuine works specification in order to give a good performance in today's Pre-1965 Four-stroke Trials.

I have personally been involved in motorcycle sport since the late 'twenties, and have been a writer on that subject for 50 years. In all that long time, I can call to mind no greater highlight than my reading of the manuscript for Don Morley's book and a sight of those fabulous photographs.

Ralph Venables  
World's foremost writer on trials motorcycling  
Swallowcliffe, Dorset  
October 1983

# Introduction

In today's age of high technology, it is important when looking back on past motorcycles to consider the ground rules which applied at the time of manufacture. The machines considered in this book were not even called 'trials bikes' but 'competition models'; they were, almost throughout the post World War Two period, simply roadsters that could also be used for all forms of competition. The manufacturer staked his reputation on a product which would not only provide a suitable means of transport, but also double-up as scrambler, roadracer, one day trials or even ISDT enduro mount.

Up until the late 1950s utility was the name of the game. Inevitably these 'comp' machines were the result of compromise, for the owner was going to ride the product to the event, compete, and then hopefully ride home again. No manufacturer could envisage designing a 'comp' model for that single purpose, indeed, its usage in trials form alone could involve up to 100 road miles during an ordinary weekend club event. Examples like BSA's competition B32 and B34 were equally adept, in Gold Star form, at scrambling, ISDT and roadracing and, with little more than a cam and tyre change, The Trophy Twin Triumph, 350 cc AJS and Matchless, Red Hunter Ariel and Bullet Enfield were almost as successful.

The name 'trials' stems from the pioneer manufacturers' desire to test adequately their products' reliability and stamina. Early trials were simply tests over the unmetalled highways on

which their customers would be forced to travel. Trials riding was most certainly not devised as a sport but as an immensely useful source of engineering feedback with which the maker could improve his product. Some test riders 'possessed more off-road flair than others and together with ample opportunity to practise in the boss's time (most of them were full-time test and development personnel) a competitive urge inevitably arose. So-called star riders could win prestige and publicity for their factories through test-riding a good machine and, more importantly, persuade a bad one to travel both further and faster. The more gullible members of the public were duly impressed. Local events were organised to show off these riders and neither the ACU, who organized these early events, nor the makers themselves, were quite prepared for the wildfire spread of public support. Large numbers of spectators would turn up after merely hearing about it on the grapevine, so that, whether they liked it or not, the organisers found themselves with a flourishing new sport.

As the sport progressed, it became clear that valuable publicity could be won, leading to increased sales abroad. The wastes of India, the outback of Australia, and the sheep and cattle ranches of America were crying out for a means of powered transport suitable for their rough terrain; they needed machines with greater ground clearance, lower gearing to tackle hills, air cleaners to save engine wear, heavier wheel

spokes and tougher tyres. The trials machine evolved as a result of these demands and the 'Colonial' models came into existence.

Such lessons in machine specification and rider control were forcibly learned when the military motorcyclists of the Great War practised their skill in the shellfire and mud of Flanders. Certainly the off-road motorcycle's future was assured by its military potential.

Peacetime dawned with more riders ready-trained for this new sport than ever before, yet far from trials machines or trials events expanding there was a period of decline. This was largely due to two factors: Britain's roads were rapidly becoming metalled and, as such, offered no challenge; and trials riding was still exclusively a British sport.

Throughout the 1920s, riders competed on machines fitted with town and country studded road tyres, the limitations of which made further machine development almost pointless until the early 1930s when the crude sporting tyre, designed for all forms of off-road use, made its debut. Then, as now, traction was the name of the game so that until the sporting tyre, even the simple between-section hills and mud slots were quite unassailable and when, in 1939, these tyres were banned in trials, the sport very nearly submerged. That factor, together with the sporting tyre reserved and improved in the 1940s for scrambling, significantly affected machine design and, indeed, riding styles. Everybody, once again, competed on the town and country treads produced by Dunlop, Avon, Goodyear and Firestone.

Trials' first purpose designed tyre was introduced at the 1949 Motorcycle Show. It was made of incredibly tough synthetic compounds in four-ply construction and behaved in much the same way when blown up or flat. Tyre limitations continued to adversely affect trials machine development throughout the 1950s and when the first of the softer, stickier two-ply components arrived in 1968, the heyday of motorcycle pro-

duction was already over.

Today, with the non road-usable supersofts also in danger of being banned, we have nearly come full circle. This is not before those British postwar classics, fitted with modern tyres, have proved themselves capable of feats undreamed of by the manufacturers and riders of yesteryear. As a result, modern pre-1965 events, even at club level, are harder than the nationals of only a decade ago. Even previously uncompetitive machines have been transformed.

It was only in the late 1960s, with the introduction of tougher sections and the loss of suitable urban venues, that the highly developed, single-purpose trials machine became necessary. Modern purpose-built machines juxtaposed with the multi-purpose bikes of the past can make us unfairly critical of the heavyweight efforts of such manufacturers as BSA and AMC. Today, manufacturers no longer need to supply large multi-gallon fuel tanks, decent road-legal brakes, or pillion space. Lightweight plastics have replaced metal to better effect, and potential road speed is of little, if any, importance. I, therefore, exhort the reader to remember that most of the motorcycles in this book are examples of a successful compromise between limited resources and overwhelming demands and, for this reason they deserve the accolade 'classic'. Far from being as dead as dodos, or worse, in honourable retirement, many old machines still give great pleasure to trials spectators, in the sort of fiercely contested competitions that would bring joy to their long-lost makers' hearts. That they are like rhinoceroses compared with today's antelopes, is beyond dispute. Thankfully, the big single lives on through an enthusiastic following known collectively as the Pre-65 Trials movement.

The heart of the classic pre-1965 trials four-stroke machine was of course its engine. The difference between the roadster's engine and that of its competition counterpart was usually little more than the substitution of an alloy cylinder barrel. This was primarily to save weight whilst aiding

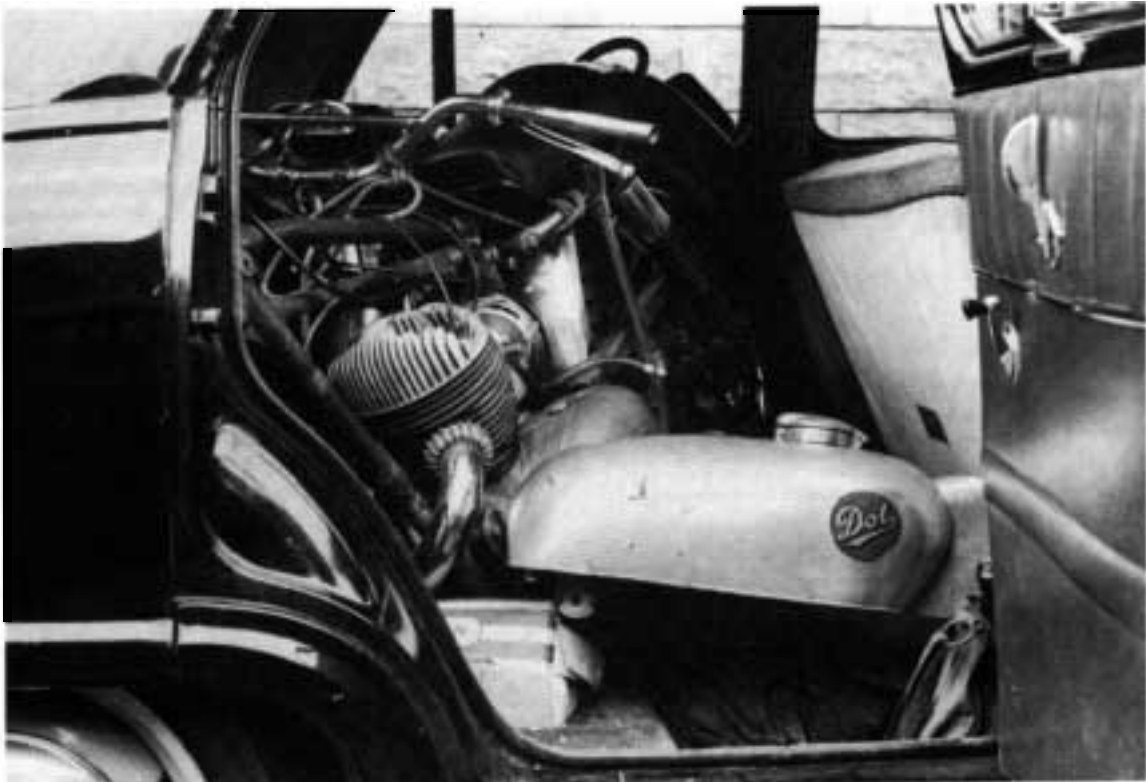
mud-splatter cooling. Cam design and even cylinder head porting and valve sizes remained identical and, therefore, interchangeable with the roadster units. This left, at least in the early days, the problem of competition fine-tuning to the carburation department, often meaning a smaller bore instrument for trials use.

During the postwar years many manufacturers, such as AMC and Royal Enfield, realized the potential for altering the power delivery characteristics of their comp jobs, simply by fitting heavier or lighter flywheels. The alternatives could usually be taken straight from other models in their own production range. The 350 cc Plumstead or Redditch trials engines were, for instance, fitted with the 500 cc roadster's flywheel rather than that of the 350 cc roadster as in previous years. These machines

then plonked as never before. BSA turned its attention to the lighter Gold Star components and Norton experimented with the heavier 600 cc flywheels.

As machines improved, so the sections got harder and trials organisers began to penalise more heavily. Successful engine characteristics changed accordingly and a winning engine in 1960 would not be the same as that of 1950. As the era came to an end and the revs and snap power of the Spanish two strokes became a threat, AMC responded by shortening their engines stroke and fitting dramatically smaller and

This picture sums up trials of the 1950s and early 1960s, even though the bike's a two-stroke. Contrary to popular belief, not everyone rode their bikes to the event; some went by Austin!



lighter 7R road-racing flywheels. The works Enfields reverted initially to their original light 350 cc roadster components before staking their future on the revvy 250 cc Crusader engine. Both BSA and Triumph followed suit.

Today, despite the charisma of an engine that plonks like a steam engine, modern supergrip tyres have made this former asset redundant. Undreamed of wheelgrip means that instant power has become more important than plonk. An occasional glance down the modern awards list of classic trials will confirm this. Those machines which opted for the shorter stroke or smaller, lighter flywheels are now dominant where even they were once outclassed. Fortunately, there is usually a simple answer for those machines on which the wheel of fortune has turned. Most classic heavyweights will benefit from a reduction in either the weight or the size of the flywheel (or, indeed, a reduction in both). This modification can be achieved by reversing the 1950s process; that is, by simply fitting the lighter roadster cranks and perhaps even machining those down to further affect performance. For plonk, outright flywheel diameter is actually more important to the trials engine than ultimate flywheel weight (compare the 350 Enfield with the 350 AJS). A compromise can be achieved by shaving the wheel side of the flywheel whilst leaving its circumference untouched. In this way you can gain revs and knock a few pounds off the machine's all-up weight. It is interesting to note that the difference in length of stroke between all of the 500 cc heavyweights amounted to nothing more than 12 mm but, as a result of those flywheels, their power characteristics varied enormously.

Make and model	Stroke	Flywheel weight	Flywheel diameter
AMC 350/500 late long-stroke	93 mm	22½ lb	7½ in.
AMC works short-stroke (7R)	85.5 mm	18 lb	7½ in.
Ariel HT5	95 mm	22 lb	8 in.
BSA BB34 (500) ZB34	88 mm	213 lb	8 in.
BSA BB32 (350) ZB32	88 mm	21.5 lb	8 in.
BSA C15T	70 mm	17 lb	6¼ in.
Norton 500T	100 mm	24½ lb	8 in.
Royal Enfield 350/500 Trials	90 mm	24½ lb	7½ in.
Royal Enfield Trials Crusader 250	64.5 mm	15 lb	6¼ in.
Triumph Cub 199 cc.	64 mm	10½ lb	5¼ in.

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