



PUSH START

THE BANTAM RACERS MAGAZINE

spring 88

Everyone else competing in the Bantam class this year will be graded as an Intermediate and can compete in the Inter Table (trophies for the first three at the end of the year). Good Luck.

M. Powell
N. Quirey
J. Sawyer
P. Tibbitts
B. Webster
B. White

Posters Advertising Bantam Racing

We have made up a number of posters advertising Bantam Racing which we hope to get displayed in Motorcycle Dealers' in various parts of the country. There are only a limited number of these posters, but if you think that a Dealer local to you would be willing to put one up in their shop - particularly if you think that their customers might be more likely to respond to Bantam Racing (e.g. a British bike shop) please get in touch with Colin or myself and we'll arrange to send you one.

Elaine.

Welcome to the first issue of the magazine, specially for Bantam racers and other interested parties. The intention is to publish quarterly with free issues going to active Bantam riders. If you'd like to receive a copy, just write to me at the address below.

You'll see that the mag contains the latest information on spares and a brief resumé of the recent antics of some of our best loved (?) riders. JS's Bit is back by popular request - well I requested it - and Colin Hall starts a new series of his once famed technical articles. One of our Antipodean members has written about racing a Bantam in New Zealand. I say "one of our members" as we have a number in Australasia. In fact, George Farenden's old Bantam was shipped out to Oz and is now famous the country over for its stunning performance. Just so that George doesn't get too big-headed, this is mainly because the state-of-tune down under hasn't quite reached our standards yet.

As some of you already know, Colin and I have been trying over the years to encourage new Bantam riders, but whilst there is a steady interest from newcomers, the hurdle of building or even obtaining a machine is usually the one at which most stumble. Even at the relatively recent beginning of my racing career, the 1978 season, there were over 100 different people racing Bantams, so where are all those bikes now? We've tried to get in touch with those people to produce a register of machines which could be available to new riders. The problem is that riders get so

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attached to their machines that they are loathe to let them go even when they have given up racing. So, if you know of anyone who has a Bantam tucked away which they would be prepared to sell or to let someone ride - even a partially built engine or bike could be a good start - do let me know. And again, if you're looking for a machine, I can let you know what's available.

Have you any suggestions for improving Bantam grids - apart from more MZs that is? Why not write me a letter for publication in our Summer issue? In fact, if you have anything interesting to say about racing or Bantams, or indeed, anything else that interests you (within reason - this is a family magazine), just scribble it down and send it to me before May 15th. Your comments on this issue, critical or otherwise will also be gratefully received.

I hope that you enjoy the mag, good luck for the new season,

Elaine

Technical Article

It seems to be a part of human nature to never be satisfied with our lot and in motorcycle racing this is certainly so. One of the most commonly heard Paddock comments runs along the lines of "if only I had another 2 or 3 mph top speed I could have got him".

The answer to this is simple - what you need is more power.

Now, let us say that you change something in the engine, and the bike goes faster. Then as you zoom into the lead the piston locks up solid. You have seized. The question is, what went wrong? Before we can begin to answer that we need to understand what it was that you did to make the engine produce more power in

the first place.

So, we need to go through some basics which often get forgotten. I have attempted to keep this short and to the point (and so have I - Ed.) and above all, simple. There are a few sums involved to emphasise a point, but don't worry if you can't get on with them.

FACT - All engines that burn petrol are HEAT ENGINES.

How do we get useful power out of heat? If we have an engine cylinder and fill it with a mixture of air and petrol, then compress this mixture by raising the piston towards top dead centre and light it by a spark from the plug, it will burn. Two of the things that happen are:

- 1) it gets hot, and
- 2) the pressure in this burning mixture increases due to the gas expanding. It is this rapid increase of pressure that forces down the piston and so turns the crankshaft.

FACT - You cannot get more power out of an engine than you put in.

So, if you put, say, 10 horsepower-worth of petrol into the engine, you cannot get more than 10 horsepower out. In fact, you will get far less as some of the energy in the petrol is wasted. There are 3 major areas where the power we put in goes.

- 1) Some of the heat produced by burning the petrol is converted to mechanical energy by pushing the piston down and so turning the back wheel.

This is what we want.

- 2) Some of the heat produced goes down the exhaust pipe and is lost.

- 3) The rest of the heat is lost in heating up the fins on the barrel and cylinder head on an air-cooled engine, or the radiator on a water-cooled one. It is this 'heat-loss' which if not properly allowed for causes the piston to seize.

Let us now put some numbers to these points and see if we can get a feel for the size of the problem.

One of the first things we need to know is how much 'heat' there is available from our tank full of petrol. Well, the answer is approximately 44 MJ/kg . Which is to say $44,000,000$ joules of energy for every kilogram 'weight' of petrol burned. "That's a fat lot of help" you say, so lets put it into terms we can understand.

So lets convert the kilograms into litres. Petrol weighs about 73% as much as water ($\frac{3}{4}$). A litre of water weighs 1 kg so a litre of petrol weighs 0.73 kg . By multiplying 44 MJ/kg by 0.73 we will get the amount of heat produced by burning 1 litre of petrol. That is, in round numbers, 32 MJ . Now $1 \text{ joule} = 1 \text{ watt} \cdot \text{sec}$ and getting rid of the seconds will leave us with watts. $1000 \text{ watts} = 1 \text{ kilowatt (kW)}$ which most of us will have a feel of from sitting in front of 1 kilowatt bar fires!

So, let us say that our engine running flat out uses 1 litre of petrol in 15 minutes (900 seconds). Dividing $32,000,000 \text{ watt} \cdot \text{s}$ by 900 s, we get $35,500 \text{ watts}$, or approximately 36 kilowatts . The total amount of heat produced by our engine is the equivalent of sitting in front of 36 single bar electric heaters.

Now, as we have noted earlier, not all of this heat is converted into useful power. If it was we would have a very fast Bantam as 1 horsepower = 0.75 kilowatts (approximately). That is a 48 horsepower Bantam!

Most petrol engines are only about 30% efficient, so less than one third of the energy put into the engine is converted into power at the crankshaft, the rest being wasted. So in our example our potential 48 horsepower engine is only going to give us about $14\frac{1}{2}$ horsepower, which is probably what many Bantams produce.

Having said that we put in nearly 36 kilowatts and only 30% is used to drive the crank, 70% is therefore waste heat, about 25 kilowatts. About half this is lost down the exhaust, but the other half has to be got rid of by the engine cooling system, which is about 12 kW .

It should be noted in the above that I have ignored a number of things, the obvious ones being the oil mixed with the petrol in two-strokes and also that some of the fuel is not burnt at all and is blown out of the exhaust with the hot gases.

At this point you will be glad to hear that I'm going to stop talking sums and numbers and hopefully come up with some more useful points.

As we have just seen, we have a considerable amount of waste heat to get rid of from our engine. A large part of this, about 40%, will be through the piston crown. In our example that is about 5 kW .

Now we all know that metal expands when heated and aluminium expands more than cast iron. So we bore and hone our cylinder so that there is a clearance between it and the piston when cold. This is where our seizing problem can occur, since apart from some cooling effect by the incoming air/fuel mixture, most of the cooling of the piston takes place by heat transfer between the piston's sides and the barrel.

It's obvious that if the clearance is too small it will seize, and if it's just right it will work fine. But the fact is that if the clearance is too large we're in for trouble as well. Too large a gap means that the piston skirt will not be close enough to the barrel for heat transfer to take place effectively and if it is much too large, hot gases will leak past the ring

and heat up the piston skirt even more. This may be fine as we accelerate up to top speed, with the heat building up slowly, allowing the clearance to be taken up sufficiently to get rid of the excess heat. Until, that is, we shut the throttle at the end of the straight and lose the cooling effect of the incoming fuel/air mixture. The piston will then nip up.

So, what's to be done?

Well, one thing that heat transfer is dependent on is surface area, which in our case is that of the piston. So if we arrange our piston so that at maximum engine power it is circular and parallel with a very small gap between it and the bore, we will get maximum heat transfer into the cylinder. Now, if we stopped this engine and removed the piston, measuring its dimensions we would notice two things:

1) it is oval, to compensate for the increase in material thickness, particularly around the gudgeon pin bosses, making it expand more in these areas,

2) it is tapered, as the top of the crown sees a higher temperature of combustion, which the skirt does not, and so expands more.

Unfortunately, the only way to arrive at the amount of ovality and taper rate for your engine is by careful trial and error, noting carefully the rapidity of seizure and under what conditions (e.g. shutting the throttle) and by careful study of the seize marks on the piston. But don't forget that if the area of the piston with seize marks is due to too large a clearance stoning down that area will only make matters worse.

Some final points: Get the barrel bored and honed by someone who knows what they're doing, and on air cooled engines make sure that the air flow around the head and barrel is unimpeded and well ducted. (NB See the way its done on a VW Beetle engine)

Race day 'Get you out of trouble remedies'. Reduce the amount of heat going into the piston by 1) retarding the ignition timing, which puts more of the reject heat down the expansion chamber, 2) increase the size of the carburettor main jet, to lower the combustion temperature and increase piston crown cooling.

Good Luck.

I would welcome comments and thoughts - of other topics for articles perhaps - via. the Editor. Regards, Colin.

Out and About on the Bantam Front

A guilty thought occurred to me whilst sweeping through a fast, downhill bend. I should not be out here enjoying myself in the sunshine, but sitting at home writing an article for the Bantam rider's magazine. It was a difficult decision. I carried on. On returning home and having stored the bicycle in the broom cupboard, I set about this great, and probably onerous task with customary vigour.

The object of this hopefully both short and concise article is to familiarise new members with those stalwart, and not so stalwart, members of our fraternity who choose to race the FORMULA BANTAM.

Decorated at the recent Dinner & Dance for Twenty-Four seasons of uninterrupted Bantam racing, BRIAN WHITE will doubtless be contending this season. Brian, ably assisted by his brother, has maintained steady and unswerving development of his machine throughout these years, without pandering to the modern Eastern Centre fashions (needless to say, Brian belongs to that centre) of water-cooling and excessively high centres of gravity.

Indeed, we can rest assured in the knowledge that nothing so radical as a successful period of winter development will result from this team, so comfortable are the leaves of laurel on which they repose. One possible exception to this could be the addition of a system of MZ proximity detectors for this season.

It will be interesting to see whether or not the 'Young Pretender' MICHAEL POWELL returns to the fray on March 5th. Marriage and house ownership at his tender age have in the past been known to present insurmountable obstacles to aspiring riders. Another occurrence which has been known to prevent, or should one say, deter a continuation of the sport, results from what I can only refer to in these august pages as a "biological interaction". Otherwise, I understand that the stoical TOM MITCHELL is preparing a new cylinder barrel for Michael's No.1 machine, an event which if it comes to fruition, will present a severe challenge to anyone attempting to wrest the coveted No.1 plate from him.

Well placed to do this, the current No.2, 'worthing's' youngest Geriatric JOHN SAWER will be commencing his twenty-first consecutive season of Bantam racing. While he has little to learn of on-track tactics (where do you think Paul Lewis got his act from?), more time spent on performance enhancement (I refer to his Bantam) would be reflected in increased mantlepiece furniture and retrogradely, in silver polish bills. The recent acquisition of a brand new IC350 (what lengths some people go to in trying to recapture their youth!) is not thought to have dampened John's enthusiasm to go for it in '88, although the petrol bills may have. The current spell of freezing weather reminds me of activities which are now probably taking place in deepest Sussex. Realising that he never got around to draining the water from his Bantam, John will be climbing over the discarded armchairs, jumble and brace-a-brac (must find out what that

really consists of) in his garage to reach the forlorn, never cleaned, let alone polished Formula Bantam. As usual he will have escaped any thermal stress induced fractures (the engine, not John) and will carry out what will undoubtedly form the major part of his winter preparation, namely the removal of riding No.4 and the affixing of riding No.2.

I have it on good authority that PETER TIBBITTS has been investing in thermal underwear recently. We can take this to mean that he will be making an appearance at the opening Snetterton meeting, presumably in an attempt to regain former glory. On the other hand, it could be down to those advancing years!

ELAINE GILLINGHAM and COLIN HALL look like taking in a bit of skiing in Val d'Isere and will thus be making use of the snow, rather than cursing it as we surely will on March 5th. When these two eventually appear at a BRC meeting it will be interesting to observe if any closed season preparations/modifications have been carried out. No preparation/modification will mean a high G&R bill for these two.

A return to Bantam racing may be made by MICK BRIDGES this season. Sale of the plumbing shop will release more spare time and if Jilly permits, we may see Mick around.

DAVE OUPRED is another with more spare time, having done a splendid job with the trophies at the recent D&D. In between doing up washing machines, Dave may even get the short stroke motor under way this season.

Doubtless having got over the embarrassment of the Dinner & Dance, MATTHEW BALDWIN may now be concentrating his efforts on winning the Intermediate Championship having finished third in last season's event.

STEVE HALL (no relation to Colin) was in two minds as to whether he would be racing this season, following the theft of his car. Evergreen JOHN MARKS will be back, presumably to continue

his programme of piston reliability testing! Also aiming to improve reliability, and refrain from foot-in-wheel acts is MIKE BARNSLY.

On the periphery, so to speak, GERRY PELL was rumoured to have retrieved his extremely rapid Bantam from a museum. Perhaps we will see this machine in motion soon, although former rider BERNIE WEBSTER is known to have his hands full with other, faster machinery this season. Former "British 250" Championship winner JOHN SENIOR has bought his nephew DAVE THORLOW's old Bantam, and as a result is considering "having a go" this season.

Well, that's about all folks. Hopefully there will be a few new names around this season so I will depart with the now traditional bottom line.

Seizure at Snetterton!

Your valiant scribe, Jonah.

Letters to the Editor

Fancy seeing your name in print? Incensed by what Jonah has just written about you (or did he leave you out altogether)? Why not drop me a line at the address on the front page and fame could be yours, Ed.

Advertisements

For Sale or Wanted: all those bits of Bantam you've got tucked away in your garage which are just what somebody else has always wanted.

All adverts free to Bantam racers or subscribers, drop me a line now, Ed.

From Our Own Correspondent

Greetings from the ? Southernmost Centre. Due to the pressure of hospital work and running the first New Zealand National Classic Motorcycle rally, the Formula Bantam has only had two outings so far this year. I scraped knees with the "bucket" racers (50 and 100cc, based on road hacks) for their National GP at the local air force base. Even with 14/54 gearing I was well behind especially on the tight bends. Our Classic club race day was a brief but fast encounter with the longer runways, but I only managed a couple of laps as the gearbox kept jumping out of second, then first under full power. So the whole bike is now apart to get it in pre-'63 trim for the big Classic Register meeting after Christmas. To keep to pre-'63 rules I shall have to hide the Motoplat ignition and remove its rev counter.

Another racing class that is becoming very popular here is the Bears (British, European and American). It is more relaxed and interesting than BOT or Formula TT. A lot of hybrid singles based on speedway engines are appearing rather than expensive exotica. The 250 class is small and mostly post-classic with a few Greaves Silverstones etc. So my project for next years evening classes is to build a short-stroke, water-cooled Bantam engine. Probably based on the Suzuki RM125 as there are many old MX bikes locally. I would be interested to know if any BRC members have used this basis for a short stroke.

I hope your racing is going well with the warm summer, it gets very hot here in leathers at 25°C plus.

John Sandall

(Warm summer, he says, huh! and it was written in November! Ed)

JS's Bit

Life Begins at Forty

It's happened. That Great watershed in life has been passed. I refer of course to my 40th birthday. Has it changed my life-style? Well yes, I'm afraid it has - you see I'm having this affair with Elsie. The realisation that I'm no longer in the first (or even second) flush of youth suddenly persuaded me that it was time I had some excitement in life before it became too late. And so Elsie came into my life - a rather fast young lady with a tendency to lead men astray. In case you think I'm being unfair to my long suffering wife, perhaps I should explain that Elsie is a shiny new 350LC (an F model to be exact). My arrival on this has caused a few raised eyebrows, since my previous two-wheeled transport, for the past 17 years, has been a 200 Zundapp. "A what?" you say. Well I admit that the average High Street is hardly lined with Zundapps, but 30 years ago the 200 was quite a popular bike being markedly superior to the Villiers powered creations (or, dare I say it, the Bantam) that were the alternatives. The west German bike has given faithful service but its not exactly exciting.

I suddenly realised that, unless I was careful, I'd spend my entire life riding nothing but the Zundapp - so - enter Elsie. Are we happy together? The answer is an unqualified yes.

Not only is it breathtakingly fast (by my standards anyway) but is incredibly flexible. It's this latter aspect which particularly impresses me, with the ability to go from 2500 RPM (about 30 mph in top gear) to the red line (10000 RPM) without hesitation.

Handling is something I will explore when I get a dry road

(whenever I wheel out Elsie at the moment the heavens open), but to make the adrenalin flow there's nothing like hearing the howl from the exhausts as the front end goes light and the needles race round the speedo- and tachometer dials. Yes, with the aid of Elsie, life does begin at forty.

Bantams and Things

I'm sure I write something in this vein every year - but why be different in 1988. This will be my twenty-second year of racing and throughout I have campaigned a Bantam. This doesn't make me the oldest Bantam rider (in either sense) but I have been around long enough to see how things have changed over the years. In most respects Bantam racing has improved steadily with the machines becoming faster, more reliable and closer to 'real' racing machinery. The one area where things are not too healthy is numbers. The gradual process of dwindling grids has been evident over the last ten or twelve years and, I believe has two root causes. The first is the overall reduction in the number of people racing motorcycles. This results from the lack of young motorcyclists on the roads, itself a function of the raising of the age to ride 'real' motorcycles, the two-part test, new bike prices and the pressing to go straight to four wheels. The reduction in the number of road racers is not helped by the diversification in racing classes. This produces small grids for almost every race. Despite the (relatively) small number of Bantams racing at many meetings they still outnumber 125s, 250 singles, 250 production and 500 single entries.

The spread of riders on machines does not conceal the underlying lack of competitors, but it emphasises the problem facing a newcomer to road racing in "what machine do I buy?". There are no classes that are guaranteed a long term future other than

those for production and open machines.

The second reason for the decline in Bantams is their lack of relevance to racing in the 1980's. Whilst spares are obtainable, the basic machine is not exactly numerous and its emergence into the quasi "classic" class is unlikely to help. This is one area in which the MZ has a great advantage. They're numerous, cheap and bits are readily available. My concerns are firstly that the Formula Lightweight Racing Club can enforce a suitably restrictive formula, and secondly the suitability of the MZ as a basis for a racing machine. However, the way some of them were going at west Raynham, perhaps my second fear is unrounded. I wish them luck.

Awards

One of my local pubs has mottos written on the beams, one of which says "The chances are - nobody remembers the runner up" to which I would add that the chances of anyone remembering the winner are pretty remote too. The point of awards is that the Championship trophies have the names of former winners on, hence these people are recalled, at least by the new holder. Secondly a trophy reminds the winner of a particular event and the "Third at Lydden" may hold more significance for the recipient than the multi-award winner who has a string of first places. Anyway, congratulations to all those who are receiving trophies, big or small.

Thanks

Firstly, can I thank Colin and Elaine for the chance to bore you all with JS's Bit, also for their tireless efforts to keep Bantam racing alive. Secondly, to all those on the Committee without whom there would be no BRC, and especially to Jim

Portsmouth who has done sterling service as treasurer for the last five years or so and suffered my endless questions (at the AGM) with great fortitude.

Thanks also to the Marshals, especially those at the March Snetterton meeting - how you avoided perishing of hypothermia I don't know. Thanks again to Elaine for the 40 piston birthday cake she presented me with at Alexander's party.

Thanks to you if you've read this far and a Happy New Year to you.

JS

(Just in case anyone is wondering who Alexander is and why he should be celebrating, it was his 25th birthday in November, and I thought that such advanced years in a VW Beetle warranted a party. Ed.)

Bantam Intermediates for 1988

In my usual autocratic way I have decided to alter the rules for this year to accommodate the (unfortunately) smaller Bantam grids.

Instead of the first three in each of last years Championship races being graded as seniors, I'm only including the first two. The same will apply to upgrading through the 1988 season. A second change is that only the top five in the 1987 Championship will be seniors. As a consequence the list of seniors for 1988 is as follows:-

M. Carkeek

M. Cashmore

C. Hall

S. Hall

M. McDonnell

M. Potter

(contd)