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The ISDE observed

Once a machine has been thrashed around the countryside for a week under scrambling conditions it is not fit for much more than blocking a hole in a hedge

ONE of the first things which I noticed at this year's ISDE in mid-Wales was the complete lack of any "Classic" involvement. True, there was a group of Vintage lads with a fair assortment of elderly machinery alongside the parc fermé on the Sunday before race week, as it were, but neither among their machines nor those of the other spectators was there any sight of anything to do with previous Internationals. Yet, when you think about it, the event carries as much weight in FIM circles as the TT, and has been going on every bit as long.

Perhaps this is due to the fact that once a machine has been thrashed around the countryside under scrambling conditions for a week it is not fit for much more than blocking a hole in the hedge. Perhaps it is because there is so little spectator interest in the sport, in comparison with road racing, but if you think about it, there is a following for Classic trials, itself not a popular spectator sport, and there is no real interest in Classic dirt-track although speedway is probably the branch of motorcycle sport with the greatest grandstand appeal. Perhaps, then, it is something to do with the sport of enduro itself, which becomes less and less of a sport the more professional and international involvement there is.

I do not say that skill, courage and determination are not required to finish the event. I do not say that enormous efforts on the part of machine designers, builders and mechanics count for little in determining who lasts the week, who wins the medals. I do not say that there is never a hint of funny business at any other major event. What I do say is that the ISDE is associated so closely with cheating that everyone expects nothing but cheating. What remains of the weekly press shows it quite plainly, as can be seen from the headline "How to win in Wales — don't get caught".



The noise test . . . carried out under the precisely controlled conditions laid down by the FIM, wink, wink, nudge, nudge

Against this pathetic background, then, a glance at the machines. Overall, the various models have many things in common. Every one has telescopic forks at the front and swinging arm at the rear, every one has tension spoke wheels, every last one is a single. Almost every one is a two-stroke, but, ah, relief, there is a special class for over 500 cc four-strokes, and a surprising number of makes are represented. The Yamaha 550 will be known, at least by name, to many of our readers. Four valves in a pentroof combustion chamber, single overhead camshaft driven by roller chain, twin exhaust pipes so that the hot spot between the valves can benefit from a whiff of cooling heat from time to



By the final morning competitors are quite used to changing tyres. This is Kevin Hughes struggling with his 500 Husqvarna. Colour picture, right, shows Neil Battery chatting with his back-up while Polish rider Ryszard Ganchewski (Simson) checks his time. Rhymney Nant Glas, day four

time. Bit clever round the other side of the engine, though. Both inlet valves open and close together in the old fashioned way, but they are fed by a clever carb. At high speed, both barrels of the carburettor feeds jungle juice as usual but at low revs or low throttle openings, just when doubling up the valves is of no advantage to speak of, the carburettor feeds only one port. It's all done by using a slide control for one port and a diaphragm for the other, so there is no sudden change-over; as the revs rise and the engine pulls harder, the diaphragm moves and opens the second port. It's not done, of course, to relieve the second valve of any loads; the valve still has to pop inexorably in and out. It all boils down to turbulence — stirring up the mixture in the cylinder by sending it in at one corner ensures that the flame front travels quickly and smoothly throughout the chamber. Too much stirring would tend to centrifuge out the heavy petrol, leaving a weak mixture in the middle where the plug is and thus making ignition difficult. This is the point at which the

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second port starts to open, so that at full throttle the two streams of mixture whirl against one another and prevent the centrifuge effect. It does seem to work too, as the 550 has considerably more top end and more lowdown power than its old fashioned elder brother the XT500.

Honda machines also figure among the big bangers — a section of the field referred to by one of our party without any disrespect at all as "The Ralph Venables Brigade" as if that revered elder statesman was somehow the only one concerned that suck squeeze bang and blow should occur one at a time and in that order. As you might expect, by the law of tweedledum and tweedledee, Honda have also done some clever work on their four valve machines, and clever work in the inlet department at that. However much you may scorn their recent claim to be first with radial valves in the XR350, newly announced on the British market to accompany their successful two valve XR200, it is certainly different.

Indeed, you might even call it a mechanical marvel but that would be unkind to their copywriters, who nevertheless should be reminded that the Honda is preceded not only by Excelsior but Rudge, BSA, and very nearly AJS, and no doubt a host of foreign machines and aeroplane engines, perhaps even the odd motorcar.

What is, I think, new is concealed by a bolt-on cover on the side of the cylinder head, alongside one inlet port. No-one at the event could tell me



Ready for business. Timekeepers are needed at every control to stamp riders' soggy cards and note time and number separately, to avoid "complications"

what was behind it. "I just kick it and it goes, me old mate, that's enough for me." The cover appears not only on the 350, but on the 600 versions used by Gerrit Wolsink and Simon Schram of the Dutch teams, and the American Drew Smith. Hours of research and investigation, well, anyway, a phone call to Honda GB, reveals the truth. Under the mysterious lid is a compartment linking the two ports, and separating them with a reed valve. Yes, on a four stroke. The carburettor arrangement is rather similar to the Yamaha, a two stage affair. At low speeds the left carburettor opens, and feeds its own port. As engine speed rises the suction across the reed valve increases, and the right port begins to draw mixture through it. Then as the throttle

opens further, the right hand carb starts to operate and begins to take over from the supply through the reed. As the pressures in the ports become more equal, the reed closes, until at full throttle both carbs are fully open. The result is very similar to the Yamaha idea; only time will tell if either gives really significant results for you and me.

"Oh, and while you're there, can you explain how you manage to operate radial valves from a single overhead camshaft?"

"Well, it's a mechanism which is very difficult to explain over the 'phone, but it's done by putting an extra rocker between the main rocker and the valve."

"The same idea as is used on the Rudge 350 four valve motor, you mean?"

"Oh, I don't know anything about that. . . ."

O tempora O mores.

Just in case there is anyone out there who thinks that most of the entry, like the great majority of bikes on the road, are Japanese, a quick sum reveals that in an entry of 382 machines only 54 are from Japan. Even among the 500s there are machines from Sweden, Czechoslovakia, Austria, Italy, Holland, West Germany and England. Among four stroke designs, though, there are only two other engines to consider. The Husqvarna is a very light four-valve head and barrel grafted on to what is quite obviously a two-stroke crank. Very professional looking, for all that, and for all its tiny flywheels it performs remarkably well. Well enough, indeed, to help Sweden into first place and France into third place in the Trophy. With such a light engine there seems little point in

using tricks and dodges to improve the low down performance, as there is not enough inertia to sustain it.

All the other four strokes used Austrian Rotax engines, including one Jawa and one Armstrong, just for old time's sake. Again, a four valve design, with symmetrical porting and no nonsense, with a cylinder head whose shape is strangely reminiscent of the late KTT Velocettes. I wonder what happened to the special 600 KTT made for the ISDT in the late '30s — but that's where we came in!

The popularity of two-stroke engines for cross-country machines is overwhelming, indeed I suspect that were it not for a special class for over 500cc four strokes there would hardly have been a poppet valve in the whole entry. Only one rider, number 179 Chris Linham from Bristol, was prepared to lumber round with the added weight of all that valve gear on his XR200, but he finished in fine style.

Looking down the entry, there does seem a preponderance of Husqvarnas and KTMs in the field, too. This could be due to the fact that both these factories have specialized for a number of years not only by competing in cross country and off road events, but by making over the counter machines which closely follow their works models at prices which the clubman can afford. There is rather more to it than that. Many of the Swedish and Austrian machines at the event were on hire. No, not from Hertz or Avis, but straight from the factory. Very sensible, too, when you consider the cost of transport from such far away places as Australia, New Zealand, and Canada. The bikes were collected by the vanload from the factories, already registered and ready to ride. The riders coughed up their hire charges, ran the bikes in, and here they are in droves. No-one seems quite sure exactly how the factory gets the bikes back, but back they certainly go.

"We had to uncrate them all very carefully and we've got all the crates stacked up ready to send them all back again."

"And what happens if you break something?"

"Break — what do you mean break? This baby ain't going to break nothing, too damn right she ain't."

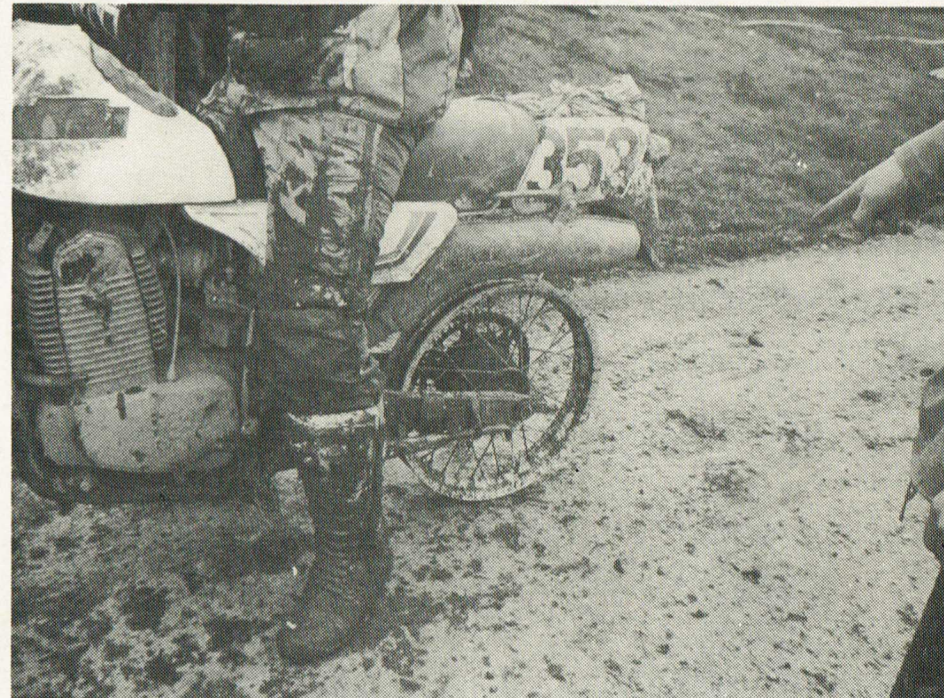
They might not have strings of corks round their hats but they do talk a bit funny, these colonial chappies.

What a splendid idea, though. Just fork out about £250 for the use of a 250 for the event. What an excellent way for the factory to ensure that their manufacturers teams have a reserve of bits and pieces to hand in case anything goes wrong with a top rider's machine. There are 16 Husqvarna manufacturers teams, and five from KTM. And what an excellent way for a factory to get some return from rows of unsold motorcycles in the middle of a world recession.

The idea which seems to be catching on in the two-stroke enduro world is water cooling. We have already seen the general adoption of reed valve controlled inlet ports, sometimes with reed valves about as large as the cylinder bore itself. One or two machines did sport disc valves in the SWM mould, with an inlet tract curving sharply backwards so that the carburettor could be tucked out of the way behind the cylinder. Another universal fitting was a resonant exhaust system. Often at least as large as the complete engine unit, without including the silencer on the end. And generally speaking, considering what cacophony can be produced by such systems, most of the machines were respectably quiet. Not silent, you understand, there was



No chance of these Simson riders being disqualified for receiving outside assistance. Their technician leans casually against his car . . . at least, until observers' backs are turned



Fritz Witzel suffered rear-tyre problems towards the end of day four. Here he is clocking in with his 500 KTM Rotax. Two outriders on KTMs accompanied him to the finish but were fended off — literally — by travelling marshals

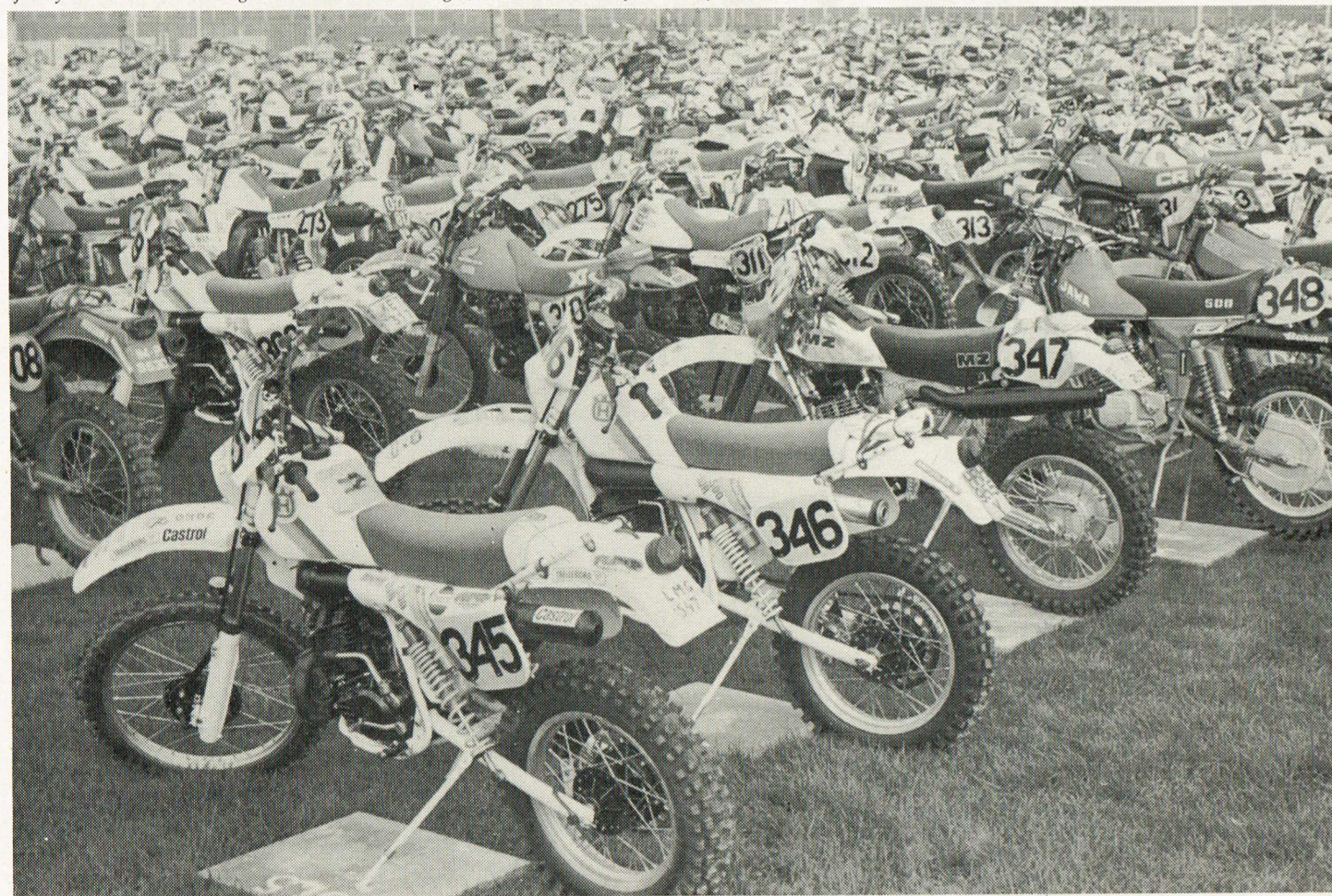
always a background of whirring and tinkling, but quite acceptable for a competition machine.

The odd exceptions were all British registered machines, and the ACU should be ashamed to have allowed some of the noisiest to compete. There was a noise meter and all machines were checked, but on more than one occasion a machine which registered more than the allowed figure was allowed through. Bikes were sent back because the lights didn't work, because they hadn't got ACU pattern numbers on, because the horn didn't work, because they were too light, but no-one was sent back for too much noise.

Noise, of course, is one of the major reasons

for fitting a liquid cooling system. Now that very light aluminium radiators are readily available and reliable, the weight penalty is not so pronounced as it was. The other major advantage is reliability combined with extra power. Any two stroke engine runs on the borderline of imminent seizure, it must do if oil consumption and the associated problems of poor combustion and blocked ports are to be reduced to bearable levels. Water cooling extends the range of tricks in porting available, and allows the compression ratio to be shoved up yet further, and at the same time it allows the cooling system to be lifted out of the mud. This can be vital for two reasons. First the thermal

If only we'd had a wide-angle lens we would have got them all in. Parc fermé, day zero



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shock when a stinking hot barrel is dunked repeatedly into peat bog, river water, or forest mud can play havoc with the proper fit of a piston in a liner in a barrel. Second, the fins lose heat by air passing over them. No forward motion means no cooling; fortunately most of the time that this occurs under large throttle openings the engine will be pretty well submerged in wet peat or mud. Once this layer has dried onto the engine, however, it forms an excellent insulator. Seizure through lack of cooling can easily occur in the forest or road sections of the course as a rider makes up for the time lost in the mire.

From a technical point of view, the International cannot be as interesting to those involved in running the event as a major road race, especially in comparison with the TT. Because time allowed for maintenance is very strictly controlled there is little chance of riders doing anything other than change tyres. At least not where anyone remotely official can see. Overnight the machines are locked away in the parc fermé. There is no chance, then, of peering down cylinder barrels, into crankcases, or gearboxes, to see what is new and different.

No-one seemed to spend much time on ignition systems, neither on plugs nor points — not surprisingly as there are very few machines now available which rely on bashing bits of metal to and fro to obtain sparks. Electronic ignition has come to stay, and not before time. In the rest of the electrical system very little innovation has taken place. Most of the lights were only in the bobby-dodger class at the beginning of the event, most of them had ceased to work at all by the end. No penalties could be lost for broken or failed lamps, so it hardly seems worthwhile going to the trouble of checking them all so painstakingly at the start. In enduros, bulb horns are still *de rigueur*. On day one, anyway.

I have left the most obvious of design innovations till last. Over half the entry had some means or other to provide a special combination of springing and damping at the rear of the machine. The various systems of levers and links all meet two major requirements — technically they provide for both springing and damping to be automatically varied in strength depending on the nature of the going,



Trying to staunch a leaking crankcase with duct tape — a West German Kawasaki ridden by Bernhard Brinkmann



Jens Scheffler busy not receiving outside assistance at the Rhymney Nant Glas check on day four

and visually they make the swinging arm look rather different from run of the mill machines. The technicalities deserve an article to themselves — perhaps next month, eh, ed? — but only time will tell whether the fashion for super-trick suspension will become general and

lead to an attack on the bastions of telescopic forks, or whether in a few years the marketing men will decide to relegate such sophistication to its place under the workbench of history, alongside split singles, nail catchers, pudding basin helmets, and old enduro machines. T.R.S.



A very early arrival for scrutineering — and almost the only British machine in the event. The Armstrong's engine is the popular Rotax four-valver