

# MOTOR CYCLE MECHANICS

AUGUST 1975 25p

## TRAIL 5 TESTS

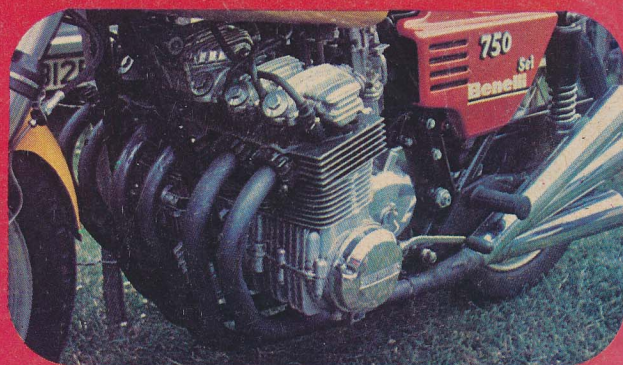


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## VIBRATION: CAUSES AND CURES

ROAD TESTS **MOTO-GUZZI 750 S3**  
**KAWASAKI SI 250**



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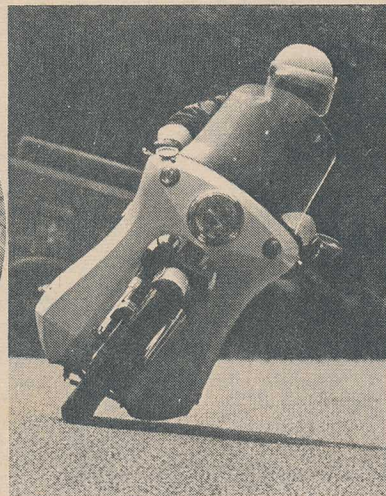
## TT TRENDS



A story of five trail bikes . . . page 29



At the TT . . . page 43



Eliminating risks . . . page 58

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- 13 WIN A GOLD WING**  
We've ordered the first UK specification 1000cc Honda Gold Wing and it could be yours for only 10p if you win our easy-to-enter competition.
- 15 MOTO-GUZZI 750S TEST**  
Shaft drive, linked disc brakes, 130mph performance, excellent handling — it all adds up to one of the world's top superbikes.
- 25 AERODYNAMICS MOTORCYCLING'S LOST CAUSE**  
Did you know that a flat plate, food side forward, parts the air more efficiently than a motorcycle? Well it does and David Vizard wants something doing about it!
- 29 TRAIL DRIVE**  
How do the Suzuki TS250, CZ 175, DKW 125, Kawasaki 125 and Suzuki TS100 trail bikes compare? We find out.
- 36 VIBRATION**  
Some types of vibration can be cured if you can find the cause. John Robinson explains.
- 39 SIMPLE SERVICE**  
How to do your own service on the Yamaha FS1-E sports moped.
- 43 TT TRENDS**  
John Robinson takes a cool, calculating and unemotional look at this year's TT and its technicalities.
- 51 KAWASAKI S1-C 250 TEST**  
Uneconomical on petrol but fun to ride with sure handling and adequate performance.
- 56 SUPERSTARS CALENDAR**  
Five times a TT winner — the amazing Slippery Sam.
- 58 LEARN ADVANCED RIDING**  
George Denton visits the police advanced riding school at Maidstone.
- 64 THIS MAN BICKERS**  
One time world moto-cross champ, Dave Bickers, talks about his CCM sidecar scrambler and his plans for the future.
- 76 NICE ONE, CZ**  
Mike Cazalet rides CZ's new 250 Enduro and likes it.
- 80 FIVE-STAR CENTENARY**  
Honda's 100th Five-Star service centre was opened this week — what does it all mean?
- REGULAR FEATURES**
- 9 READERS' LETTERS**
- 71 SIXTEENER SPECIAL**
- 75 INSIDE LINE**
- 85 SERVICE SCENE**

# TT TRENDS

KODAK SAFETY FILM



## JOHN ROBINSON TAKES A COOL AND UNEMOTIONAL LOOK AT THIS YEAR'S TT AND ITS TECHNICALITIES.

Friday June 6 may have been the day on which Hailwood's eight-year-old lap record was shaved by 12 seconds by Mick Grant, but in the months to come we'll probably look back on this year's TT as being of much more significance in many other ways.

While the TT's fate as a world championship meeting hangs in the balance, the new formula production race took a lot of the interest away from the classic events. It showed, among other things, that the Tourist Trophy is quite capable of standing on its own as a unique race. Development of production racing machines is a lot closer to home than the highly specialised GP racers and is, after all, what the TT was all about when it was first introduced.

This year's TT may also go down as the year in which everyone had to pay more attention to frames, suspension and tyres than ever before. With the excesses of power currently available the road racers are discovering what the moto-crossers found out last year.

The Island circuit is more demanding in every way than GP circuits, so highly specialised equipment becomes less and less desirable. Like the tyres which only work under exactly the right conditions and bear little relationship, other than shape and colour, to the ones we all use. They may be fine for Daytona but are less practical on a circuit which can have one half drenched in sunshine and the other just as drenched but by a thunderstorm!

Chassis and transmission reliability are as important as engines; Mick Grant's record breaking Kawasaki snapped its chain in the Open Classic TT when the wheel moved slightly out of line. And in the same race, 46 retirements out of 69 starters should give an idea of the way development must go.

Now engines are giving the power the problems come in

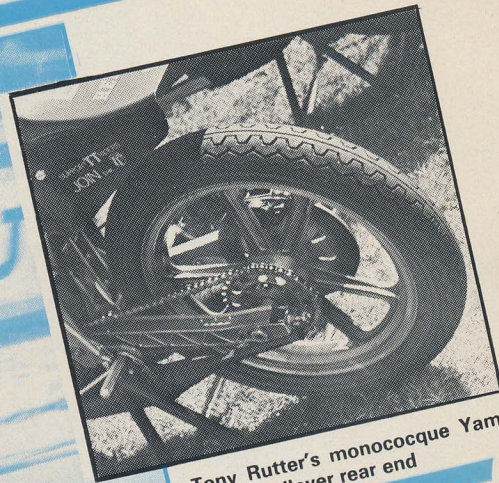
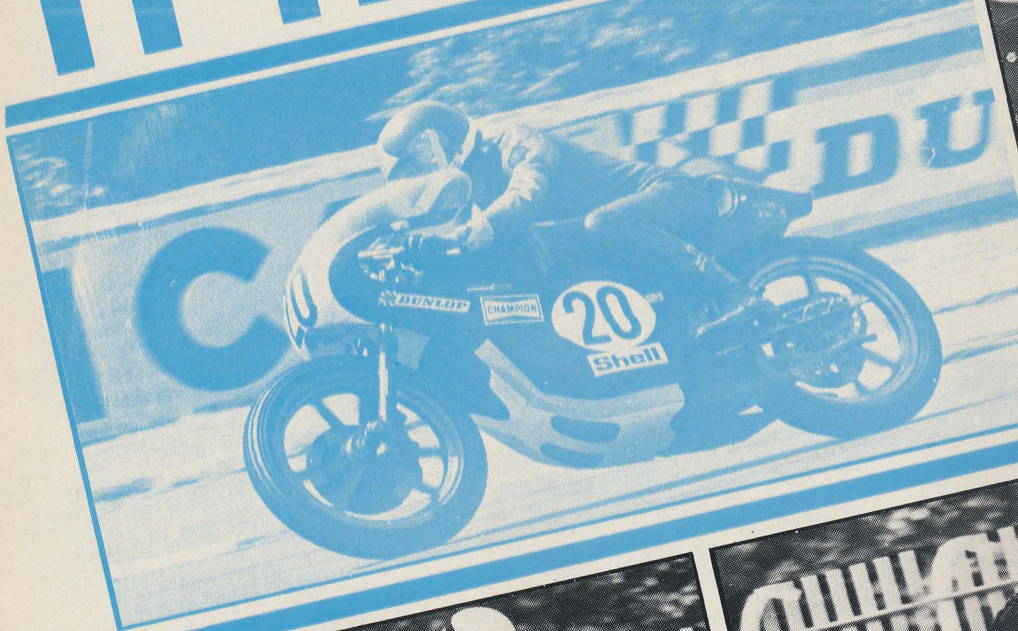
being able to use the power and the age-old one of keeping the machine in one piece. This can only be good if it means that the knowledge gained and the subsequent developments are passed on to road bikes.

Highly specialised tyres and almost rigid suspension provide an answer on most of the GP circuits but this introverted development is as much use on the Island as it is to the every day rider. So where can we expect to see developments which will be worthwhile? The biggest ought to be in suspension because no more power can be used until the wheels can be kept hard on the ground; even that is no use if the suspension movement causes the transmission to destroy itself or makes the handling worse. And the tyre designers will also have to keep abreast of any new advancements.

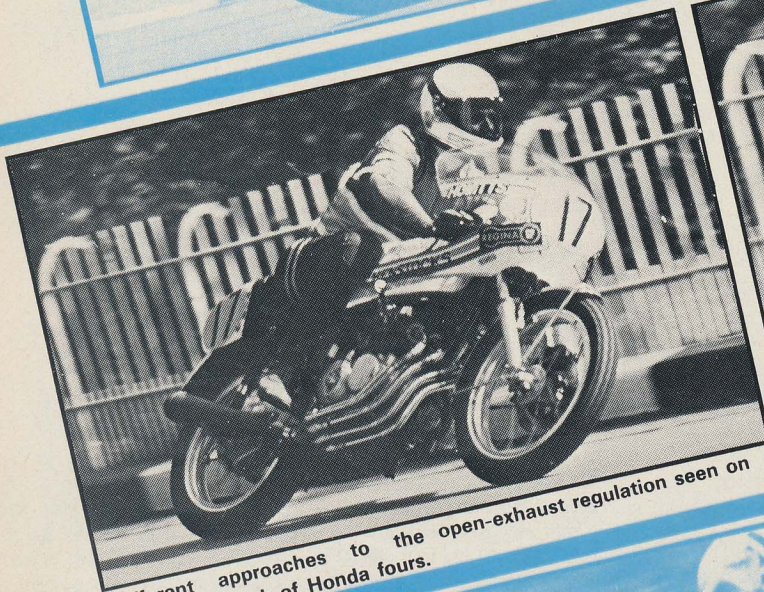
One other aspect is aerodynamics. Look at it this way: when the outright lap record was finally broken there was criticism because it had taken so long to do and because even then it was on a machine more than twice as big as Hailwood's Honda. I'd have said that that was more a tribute to Hailwood's skill and Honda's engineering, but that's by the way. The thing is that at these speeds — 160 plus — it takes a lot of horsepower just to get one more mph. To *average* one mph more means you have to go that much faster all the way round or to keep the same speeds on the corners and difficult bits, and to go a lot faster along the straights. Not only does this require still more horse-power but it assumes you have a rider and a chassis capable of using it.

I'm not saying we've reached the finite limits of engine development, but pretty soon the designers are going to find it's a lot cheaper to stop fighting the airstream with brute power and to start cheating it with decent streamlining.

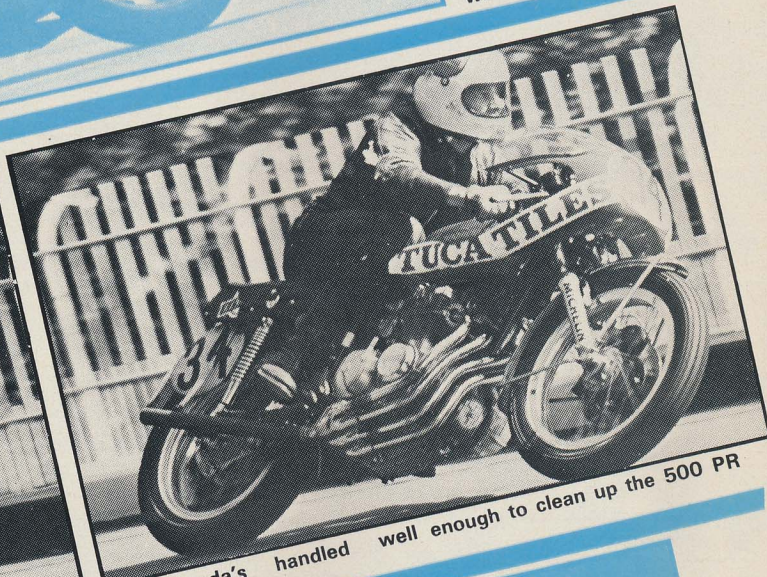
# TT TRENDS



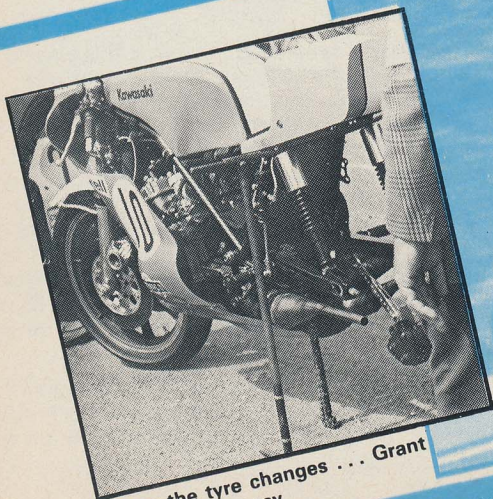
Tony Rutter's monocoque Yam with cantilever rear end



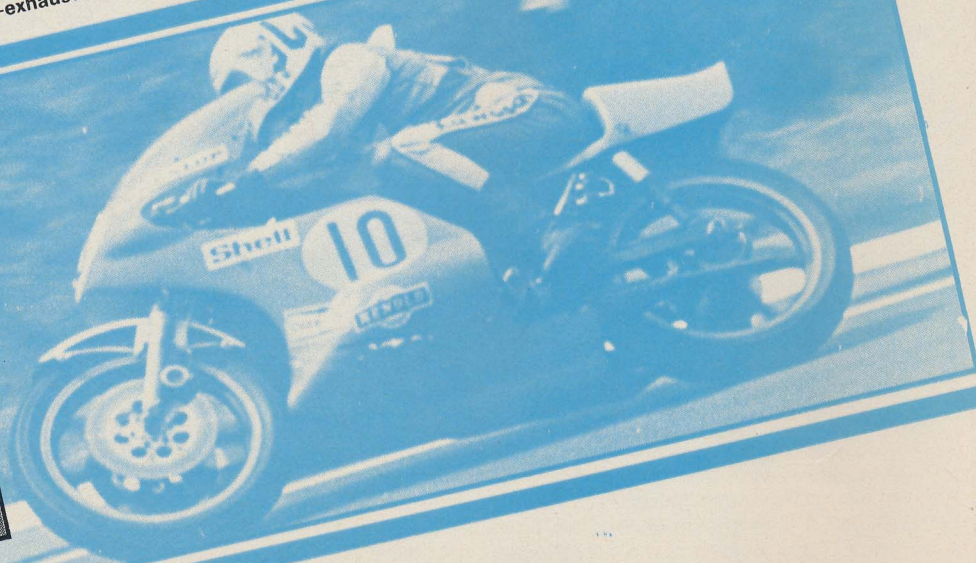
Different approaches to the open-exhaust regulation seen on two of the flock of Honda fours.



The Honda's handled well enough to clean up the 500 PR class.



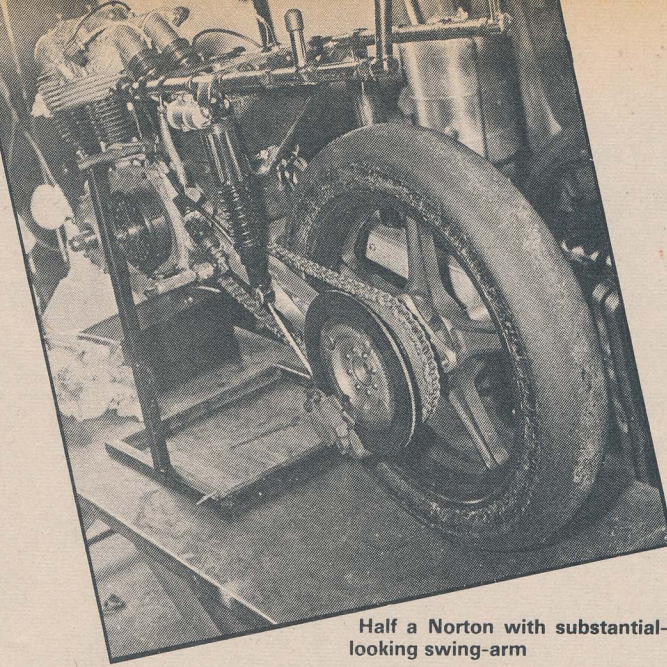
After the tyre changes ... Grant made it look easy



The highlight of this year's TT was, for me, Saturday's production race. Not that there weren't plenty other moments of spectacle and drama, like Mick Grant's 109mph lap which was even more impressive because he made it look so easy. Or the sheer impression of speed watching Steinhausen's outfit skimming over the mountain's bumps.

But a 400-mile production race which keeps spectator interest all the way through to the last lap has to be a good thing, especially when it's arranged so that a 250 can beat most of the 1000s.

By having three le Mans type starts the spectators were given real racing to watch as each group went through, without having to wait twenty-odd minutes before the next lot appeared. Then as the three classes began to straggle into a long convoy, interest was maintained because the bigger bikes were catching up with the smaller ones. The drama was prolonged again when the 250s were credited with an extra lap half-way through and it became obvious that the timing of pit stops and rider changes was



Half a Norton with substantial-looking swing-arm

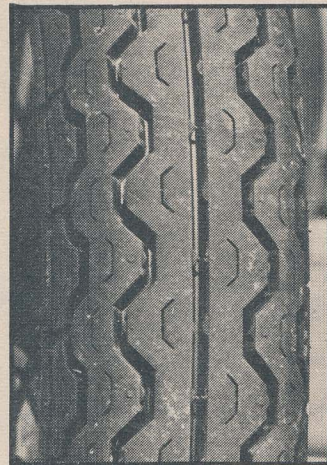
the handicappers got their sums right and the whole thing was rounded off by the excellent commentaries which managed, via the PA-Manx Radio link-up, to keep a fair picture all the way through the race.

This is getting back to what the Tourist Trophy is all about and for riders, manufacturers, organisers and spectators it must be a step in the right direction. It would be nice to see it extended further, making the race longer by enough laps to

admits that there's even less room for mistakes on the Island than on other GP circuits and from this point of view no rider should have to race there in order to pick up championship points.

The TT can easily stand on its own merits but the emphasis will have to be switched. The long distance production race looks like the way to go and the UK needs an endurance event anyway. I would like to see an additional class for prototypes, like they have in the continental coup d'endurance events because this would allow factories — and individuals — to use what Peter Williams describes as the world's best testing facility without getting bogged down in homologation rules. A heavy handicap would remove any criticism of works' specials walking all over the privateers.

The production race is likely to extend development, too.



Tread pattern of the new Avon

allow one more rider change but this would be too much of a gamble as it would be that much more difficult to handicap and bad weather would soon destroy spectator interest over such a long period.

The TT's fate as far as World Championship status is concerned now seems of much less importance; the TT needs the FIM even less than the FIM needs it. The spectators will go no matter what the status and the riders who do turn up do it because they like it. Everyone

Seven different makes figured in the first fifteen places, which made Tuesday's procession of thirty-odd Yamahas, a Honda and an Aermacchi seem pretty drab.

The tyre companies also seemed to be doing a brisk trade, vying with Renolds and Champion for positions in which to fit their stickers. Michelin and Dunlop were busy checking pressures and treads, most of the large number of BMWs were wearing Metzlers while a select few, including the Knight/Walsh R90S were running on the new Avon tyres. This kind of competition is a lot healthier and less costly than continually monitoring the barometer to decide which slicks to use.

The new Avons, which seemed to fare well enough through the TT, are called Road-runners and are essentially high-speed road tyres, as opposed to racing tyres. The sizes range from 3.60 to 4.70 in the 18 inch diameter, 3.60 and 4.10 at 19 inches and a 5.10x16. Recommended prices range from £13.90 up to £22.83.

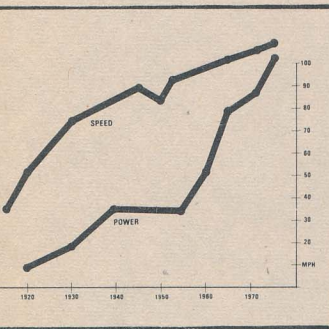
As the pre-race tension built up on Saturday morning, the Agrati mechanics had a few extra anxious moments when they couldn't find the Benelli six that Keith Martin was to ride. This probably had the greatest curiosity value of all the production machines and everyone seemed surprised to find that it actually handled quite well. Keith certainly looked tidy on it but its performance remained an unknown quantity when the oil pressure switch blew its seal and dumped all the oil early on in the race. Later in the week Keith switched from his Suzuki to ride the Benelli in the open classic and took it to a pretty creditable 18th place.

A slight change in the regs allowed the proddie racers to use open or megaphone exhausts. This seemed to benefit the four-strokes most and they turned out with all manner of plain pipes, siamesed pipes and megas, while the two-strokes looked sedately standard, although some didn't exactly sound standard. This was another good move; there's something appealing about the wail of an open exhaust especially across the Island's open countryside. And there's a chance that something more will be learned about exhaust systems.

Although the handicap was too much for overall placings, Honda cleaned up in the 500 class. I was mildly surprised to see the 400-fours doing so well, mainly because I didn't think their top speed would be high enough. In standard trim the four is good for just over 100mph,



Les Williams — owner and preparer of Slippery Sam



What you need to go faster — a comparison of power and lap speeds

going to be critical. Just how critical, and how well the handicapping has been worked out was shown by the close finish between Alex George on the Trident and Chas Mortimer's 250.

Just over 15 minutes covered the first 20 finishers — six 1000s, six 500s and eight 250s — which is pretty fair handicapping although the low placings of the 500s meant that they had been over-estimated by some nine or ten minutes. It also compares well enough with the Junior and Senior when the first 20 finishers were spanned by eight and 11 minutes respectively — on corrected time.

There are several areas in which such a race could fall flat — the handicapping could have been hopelessly wrong, it could have been utter confusion. But

# TT TRENDS

with a lower riding position and a fairing you could expect something like 112 and a bit more down the hills but the Kawasaki production racer we ran a couple of years ago would pull something approaching 130mph.

Having said on several occasions that top speed just ain't the whole answer, I guess I should have known better; in a short circuit scratch the 400s may have been blown off but the Island circuit needs handling and comfort just as much as power. So it was nice to see the comments we've made in road tests coming true as the handling and general rideability of the Honda fours paid off.

For the same reason it wasn't surprising to see so many BMWs nor to see Dahne gracefully leading the biggies until he knocked a hole in one rocker box ... Dahne, who worked for BMW and recently transferred to the closely-associated Metzeler concern is not works sponsored and actually owns his BMW. Apparently the 900 motor is fitted into a stock /5 chassis, which he considers to handle well enough (he is larger than most of us) though most of the other BMs appeared with extra bracing pieces bolted on to the frame.

Attention to frames, suspension and tyres seemed to be a major thing this year. The works Nortons (for want of a better name) had some impressive-looking swinging arms including one which looked as if it had been machined from solid. It was a pity that their total race mileage barely exceeded one lap — a duff battery putting Jack Findlay out while Dave Croxford's machine got an oil leak. Perhaps they're developing a Son of Sam.

The Maxton cantilever frames appeared to work quite nicely, judging from where we watched at Creg-ny-baa and the Bungalow and from their frequent appearances in the results lists. Tony Rutter's monocoque cantilever, built by Eric Offenstadt, also looked impressive; the most noticeable points were that these machines seemed to be going just that little bit harder through the corners — which, of course, is only an impression — but the exhaust noise certainly came on sooner showing that they were consistently getting power on earlier into the turn, something which is quite noticeable at a clearly defined corner such as the Creg.

Now that ample power is on tap, one way or another,



The Stevens/Casey RD250 ran Avons and finished 9th in the production race.

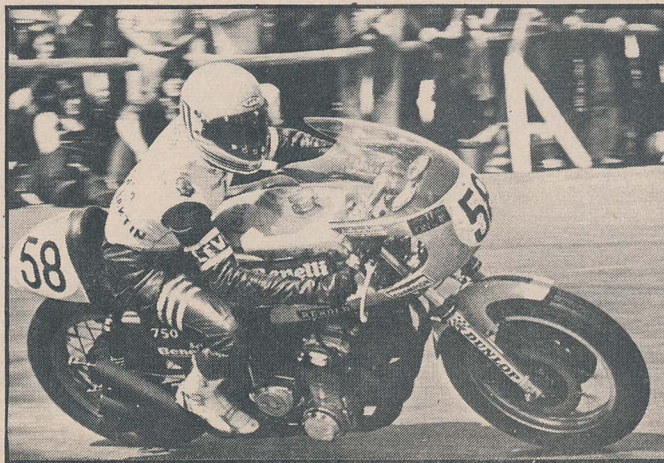
changes in frame design will become more and more necessary. Not only for handling sake, but to transmit more power more of the time and to keep the transmission in one piece. Watching Mick Grant win the 500 race, it seemed that he was going appreciably slower through our corner than many other riders — whether this was because he was that much smoother and made it look easier or whether he was rolling it off a bit and using his Kawasaki's performance along the straights, was difficult to tell. Certainly if it was the latter then Mick could have knocked several seconds off his times just by scratching a bit harder — as it happened he didn't need to.

Mick could be seen having head-scratching sessions with the Dunlop people and making suspension adjustments before each race, but in the Open clas-

sic his chain snapped when the back wheel got slightly out of alignment. Rutter also had chain problems when his Yam touched down after Ballaugh. Renold had produced a special thick-wall chain with a considerably increased breaking strain but making stronger chain links has a limited future because more strength eventually means more weight which, when flinging around sprockets, means still more stress. He who has the best suspension will find he doesn't have to spend so much on chains.

All this may be the answer to those critics who somehow can't appreciate that knocking even a few seconds off Hailwood's record is an achievement. Eight years of development is only worth 12 seconds is what they are saying — and it will continue to be a game of diminishing returns. We've produced a graph

Keith Martin wheeled out the Benelli six for the Open Classic



spanning the history of the TT which compares the horsepower available to the winning speeds; obviously it cannot take into account poor weather conditions, track resurfacing and so on, but the general trends are very clearly shown. Once the lap speeds had got up into the 90s, enormous power increases were needed just to go a few mph faster.

The higher the speed, the more the problem compounds itself and reliability, tyre problems and transmission problems become more acute.

Many riders opted for 350 Yamahas in the Open Classic, presumably preferring their manageability to the sheer power of the 750 TZs so it was interesting to compare the progress of the two. After John Williams' heroic ride (on a 350) Percy Tait came in some four minutes down on the first 750, followed by Charlie Sandby's Suzuki and four more 350 Yamahas before the next TZ700.

There are two other areas which will come in for improvement eventually. One is fuel consumption — a guy could save 20 or 30 seconds every time he didn't stop for fuel ... It is also something the organisers could make more of; at the le Mans 24-hour car races there are prizes for what they call the index of performance and the index of thermal efficiency. These are worked out by complicated formulae which take into account engine size, distance travelled, fuel used and other relevant factors. It is useful as an alternative method of handicapping but its importance is entirely dependent on the prize money attached to it.

The other area is aerodynamics. The kinds of speeds the big machines are reaching will make sure of this because they won't easily find the power necessary to go any faster and even if they do the machines will get less and less stable.

Probably the FIM will have to change its regulations about fairings — although a nose fairing would seem to be less important than a tail fairing — but to get an idea of the potential effects, look at what happened to car racing. Speeds and handling improved considerably during the few years between the Chaparral wearing aerofoils and F1 cars adopting them as general practice.

This is one of the few "specialised" areas which could have a beneficial feedback to roadsters, simply because roadsters have no shell or aerodynamic surfaces and the designers could start with a clean sheet of paper. Which is all back to what the TT is about — let's hope some of it actually happens!