

CIRCUIT

MARCH/APRIL 1981 50p



YAMAHA YZ465 GUEST TEST



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Whatever the SR500 hasn't got, she certainly has more than her share of character.

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But for our engineers, building the SR500 was a labour of love — an act of homage, if you like, to the great traditions of motorcycling.

She doesn't bristle with new-fangled gadgets. (If you can't kick-start a motorbike, don't fool around with an SR500. It'll only end in tears.)

But when you do start her, she certainly lets you know about it. Big singles generate a lot of torque in widely-spaced bangs, and you'll notice a difference if you're used to multi-cylindered machines.

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And while there's a definite knack to kicking her off, a manual compression release and electronic ignition eliminate a lot of the frustrations of yesteryear. After a bit of practice, you should be able to start her first time, even on cold mornings.

Her cast wheels have no spokes to tighten and her designers were not such purists as to leave off the self-cancelling indicators and the quartz halogen headlamp.

In their excellent review of the SR500, 'Cycle Magazine' compared her to an old castle: "A chunk of an exciting past brought forward to the present."

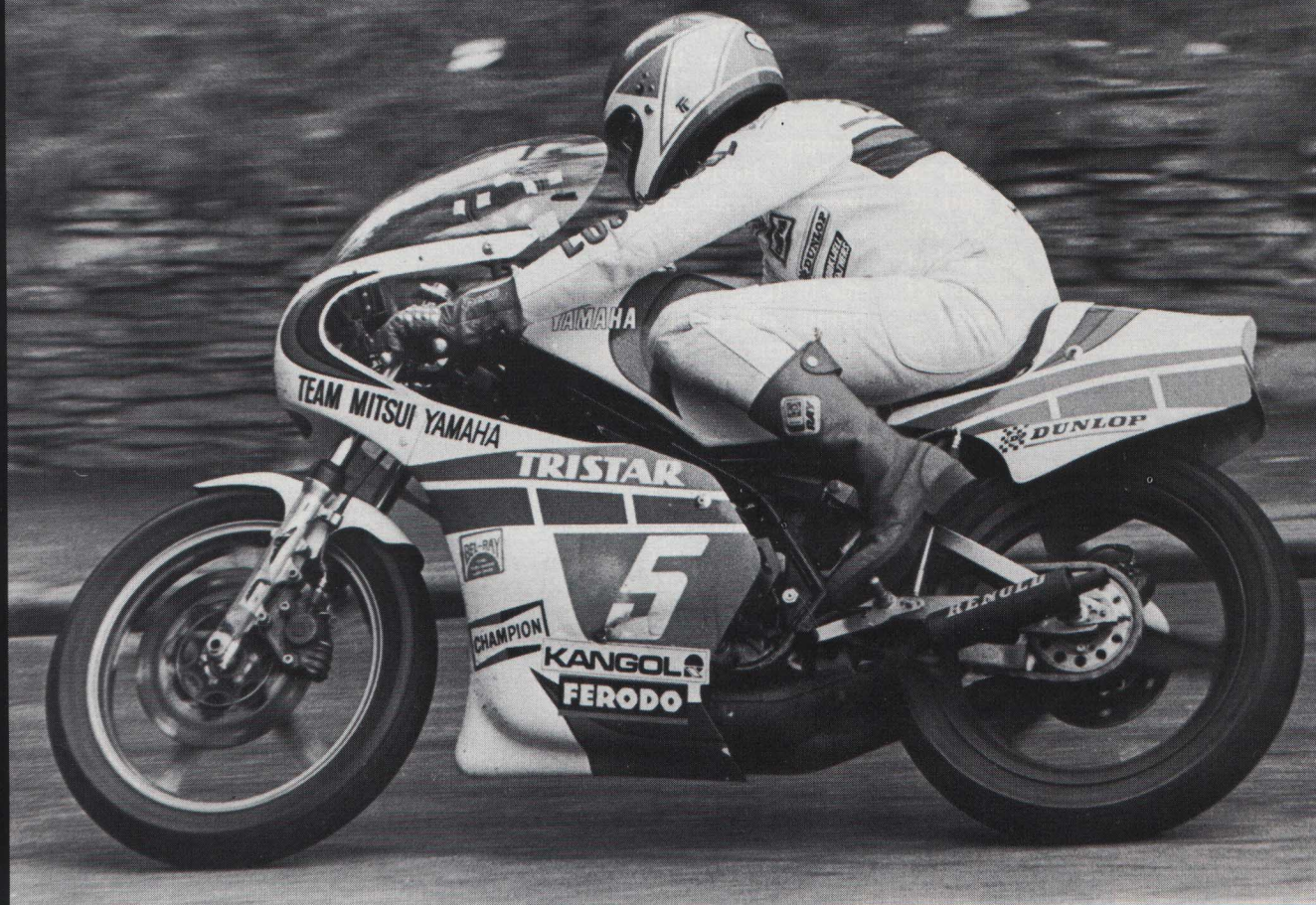
But they summed her up perfectly when they wrote: "If you had a castle, you'd want it to have modern plumbing."

"Yamaha's SR500 has the plumbing."



YAMAHA

TEAM MITSUI 1981



Charlie Williams will pilot the new TZ250

Following a highly successful 1980, during which they took one World and one British road-race championship, plus high placings in championship series in both motocross and trials, Team Mitsui have decided to build on that success in the coming year. Under the guidance of Competitions Manager, Robert Jackson, they have assembled a team of no less than twenty riders in a determined assault on World, European and British championships in all branches of the sport.

As the two forms of motorcycle sport most in the public eye, road racing and motocross obviously take the lion's share of the team with thirteen riders split between them, but other forms of motorcycle competition are far from ignored.

A "formidable foursome" of experts will be bidding for honours in the trials world, led by newcomer to the team, Rob Shepherd, and veteran, twice World Champion, Mick Andrews. Also lining up for Mitsui in British Championship events will be Norman Shepherd and Ady Morrison. All of the team will be

riding specially prepared TY trials irons, virtually identical to over-the-counter models.

Mick Andrews will be doubling-up his commitment to Mitsui this season, as he is also a member of the new Enduro team. With an impressive five wins in the Scottish Six Days Trial and six gold medals for the ISDT he should be well in contention for honours at the end of the year.

Another former champion switching sports this year is Welshman Andy Robertson. A successful member of last year's motocross team, and runner-up in the British Championship, Andy feels that after fifteen years in motocross it's time for a change, and after finishing third in last year's Welsh Two Days Trial (Mick Andrews finished close behind in fourth) he is obviously confident of doing well. Also doing battle for Mitsui in the British Enduro championship will be newcomer to the team Derrick Edmondson who, like his more experienced team mates will be riding Yamaha's new production

Enduro II machines.

The big news as far as road racing is concerned must be the signing of ex World Champion Barry Sheene. After a season of mixed fortunes on his privately sponsored Yamaha, Barry can look forward to the full support of Mitsui in a bid to add to the World titles he held in 1976 and 77. Barry starts his assault on Kenny Robert's World Title in Argentina in March and by the time the Grand Prix circus reaches Silverstone in August British fans could well be cheering on an English World Champion. That vast army of Sheene fans need have no worry about only seeing Barry in action in the Grands Prix either. In return for the full backing of Mitsui, Barry is proposing to fit as many British events into his calendar as World Championship commitments will allow.

Mitsui's only World title last year came from the world of road racing, with Charlie Williams clinching the Formula 2 championship at the Ulster Grand Prix. It was a memorable season for Charlie, who as well as taking the World Title, added to his

TEAM MITSUI 1981 (cont)

T.T. wins with an amazing one-day double in the Junior and Formula 2 events. This year should see him add further wins to his already remarkable record in the Isle, and he will also be competing in British Championship events and several Grand Prix.

With Charlie in the Isle of Man last year was the 1979 Yamaha/Marlboro Clubmans Champion David Dean. He finished a creditable 11th in his event and had several good results throughout the season. This year he will, once again be taking part in domestic championships, and with the invaluable experience gained last year he could be in with a chance of honours at the end of the season.

Although winning the Yamaha/Marlboro Clubmans series does not automatically mean inclusion in the Mitsui team, last years winner Tom Drury begins his first season as a works rider later this year. Despite being only twenty, Tom has a wealth of experience on British short circuits and, in fact, notched up an incredible 99 wins during 1980. His reward for his efforts over the last couple of years is a chance to campaign both TZ250 and 350s in British Championship series.

The other new recruit to the Mitsui camp is Steve Parrish. This seasoned campaigner will be contesting the 500cc British Championship aboard a TZ500.

It is the sport of motocross that attracts the largest number of riders to the Mitsui team this season, and the good news as far as British fans are concerned is that both Yamaha contenders for the World Championship will be based in this country.

Neil Hudson, although only twenty four, already has several years experience of the Grand Prix circuit. After coming second in the British title in 1978, he followed that up by being runner-up in the World Championship the following year. Last year was eventful, to say the least, and Neil hopes, with the help of Mitsui to put all his earlier problems behind him and finally lift the World crown. Alongside Neil in the World Championships will be David Watson who despite being only nineteen can boast eight years experience in motocross. His first championship win came as a schoolboy in 1976, and two years later he followed this up by taking the under 18 title. This will be his first full year in Grand Prix

racing and it should be a valuable starting point in what promises to be an outstanding career in motocross.

Mitsui will also have two experienced riders contesting domestic championship this season. Roger Harvey is the most experienced with fifteen years of motocross already under his bodybelt! During this period he has finished well up the placings in several championship series, including eighth in last years British Championship and fifth overall in the 1976 125cc World Championship.

Pete Mathia is not far behind with ten years in the sport and his recent wins include the 1980 Isle of Man Grand National and the Pembroke Grand National.

Mitsui have always backed the A.M.C.A. riders, and this year is no exception. The team of four riders is headed by last years 750cc champion Mike Frost. During last season he also finished second in the Superclass series and was the best British rider (fifth overall) in the I.M.B.A. international series. Backing him up will be a trio of young riders, Gary Embleton, Alan Scott and Barry Shakes, all of whom can boast championship wins in AMCA events.



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Operating on the lines of a Club, with a twice yearly Newsletter, we will be using, on a regular basis from March 9th, 1981, Silverstone, the home of the British Grand Prix, in Northamptonshire, Cadwell Park near Louth in Lincolnshire, and Donington Park near Derby.

Due to the tremendous interest shown by Northern enthusiasts, we will also be going International for the first time, and opening at Knockhill in Scotland.

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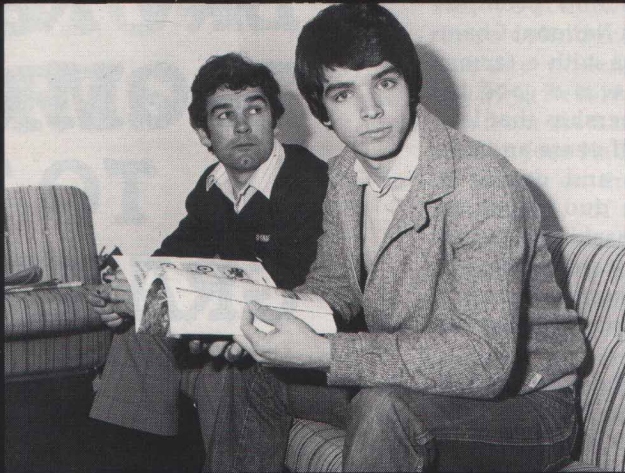
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TEAM MITSUI 1981 (cont)



Enduro teamster Andy Robertson (left) and young Motocross star, Dave Watson.

Barry Sheene - Road Race Team Leader.

So as you can see from the impressive line up of riders this is no two-or-three man team merely "showing the flag" but a determined effort by Mitsui to back home-based riders in their various title bids, and it doesn't even end there.

As well as backing individual riders, Mitsui are also doing a variety of things which can only benefit the sport as a whole. They will once again be backing the Yamaha/Marlboro Clubmans Championship, a series that has done so much to spotlight home produced talent, and they are at the moment considering some form of involvement in the new M.C.N. "Streetbike" race series.

Everyone saw, last year, the race winning potential of the water-cooled RD350 and a new series with a format possible unique to British racing should demonstrate the machine's potential even more. The RD350 Cup will be contested by twenty riders throughout the season, (ten professionals and ten club riders) and to ensure that the full-time professionals gain no unfair advantage over the "shoestrings" racers all the bikes will be factory maintained.

So at the beginning of each race riders will "draw straws" for their machines, so at the end of the day outcome of the race will depend entirely on rider ability and not on the money they are able to invest in special equipment.

With a full-strength team contesting all championship events in every branch of motorcycle sport it's almost certain, come the end of the season, Yamaha will be well placed in the various championships and, even if your favourite rider happens to be on some other make of machine there is a good chance that Mitsui's involvement in motor cycle sport has helped get him where he is today.

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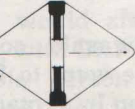


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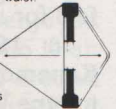


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Softspoken, ace two-stroke tuner Erv Kanemoto has several things in common with outspoken, top-notch road racer Barry Sheene. They both really like road racing and they both have an intense desire to win. Kanemoto, a 37-year-old American-born Japanese, will be tuning Sheene's factory-supplied Yamahas during the 1981 season. Between them, they plan to do some winning!

Kanemoto is well respected and highly rated by riders and tuners alike. "He is one of the very best tuners in the world, in my opinion," says his former partner and ex-American National Champion, Gary Nixon.

When Kanemoto first began working on road race bikes in 1968, he already had over ten years of experience tuning two-stroke engines.

"I've been around racing all my life," Erv recalls. "My father was involved in racing boats so I grew up going to the boat races and helping my dad. I became interested in go-kart engines and began building modified engines and chassis. We would buy quite a few engines in a year, modify them, and sell them to racers. I raced karts myself through the late 1950s and into the middle 1960s. That's when I developed a feel for racing.

In 1968, Kawasaki contacted Kanemoto and he went to Daytona to tune Walt Fulton Jr.'s rotary valve twin for the 250cc lightweight race.

Kanemoto became hooked on tuning the fast motorcycles and turned all of his talent from 1968 onwards to racing bikes. He came back to Daytona in 1969 with a privateer 500cc three cylinder Kawasaki for Jim Rice. His reputation as a tuner began to grow over the next few years. He built a couple of fast single-cylinder Suzuki 250cc short track engines for top U.S. national dirt-track racer Don Castro.

One of Erv's most satisfying dirt-track ventures came at the Houston Astrodome in 1973. The AMA had just changed the displacement limit for short-track racing (less than quarter-mile ovals) to 360cc.

"The American BSA-Triumph/Rickman distributor called and wanted me to build two engines for their factory riders, Gary Scott and Gene Romero. They only had 250cc Montesa engines in the Rickmans at the time. So I built the engines and Scott took second in the National Championship event to Kenny Roberts, who was on a 360cc factory Yamaha. That was pretty satisfying.

In 1973 Kanemoto and Gary Nixon got together and promptly won three American National Championship Road Races with a factory Kawasaki triple. It was a good beginning to the partnership that lasted for five and a half years and saw some amazing ups and downs in Nixon's career. The duo stayed together on both Kawasaki and Suzuki factory teams and came within a scoring mixup of winning the 1976 Formula 750 Championship for Kawasaki.

Erv and Nixon then ran a privateer Yamaha in the American Nationals until mid-1978 when "we had to give it up due to the cost," said Kanemoto. At that period he also tuned for a young Californian by the name of Randy Mamola! The partnership ended, however, because Erv just couldn't handle the workload imposed by two riders.

Nixon and Kanemoto remain close friends. "We had a lot of fun and I certainly learned a lot during those years," says Erv.

By the mid-seventies, Erv had tuned an amazing array of fast two-stroke machines, among them—Kawasaki 250cc road racers, Kawasaki 500cc road racers, Kawasaki three-cylinder air- and water-cooled 750cc road racers, 250cc Suzuki and Rickman-Montesa short trackers, Suzuki three-cylinder 750cc water-cooled road racers and, of course, Yamaha 250 and 750cc four-cylinder road race bikes.

"I can't really say which of the machines I've worked on had the best potential," says Erv, "because I've never had the time and money to go as far as I would really like with any of them and they were in different eras. If I had to answer I would say maybe the Yamaha four-cylinder 750. But I'm not really sure. That's why I'm really excited about working on genuine factory Grand Prix bikes this season.

"In the past I've done a lot of development work, within the limits of time and money. I enjoy working under controlled circumstances, with a flow bench and a dyno. When you make subtle changes with port shapes and timing, with exhaust pipes and so on, you can tell immediately on the dyno if the change was for the better and how much of an increase you have achieved. At the race track, of course, there are constantly changing conditions which affect the bike. Therefore, it's much harder to measure your effort on the track. However, I figure the only way to judge it is by whether your bike is winning or not!"

ERV KANEMOTO FROM GO-KART TO THE GRANDS PRIX

By Susie Mann



Erv Kanemoto pushes Gary Nixon out to the Daytona starting grid, reflected in a trackside pool of water left after one of Florida's notorious tropical cloudbursts.

KANEMOTO— D-KARTS THE PRIX!



Erv also worked on the controversial 750cc two-stroke Kawasaki three-cylinder mile dirt-track machine ridden by Scott Brelsford in 1974. Best result was a heat race win from the back row of the grid at the San Jose National Mile. He worked closely on the project with Doug Schwerma, of Champion Racing Frames, the chassis builder.

Remembers Erv, "We ran into a lack of time and money on the project. I was also involved with Nixon's Suzuki road racer then so the dirt-tracker perhaps never got the attention it deserved. We did feel the multi-cylinder two-stroke engines had fantastic potential in dirt track racing." (Kenny Roberts won the Indy Mile that year on the amazing Yamaha TZ700 four, which Schwerma also built the chassis for, and then the AMA banned the controversial two-stroke multitis at the end of the season.)

"I don't know if that ban was good or bad," says Erv. "One year later Goodyear came out with the DT series super-wide and sticky tyre for dirt-track use. If they'd had that tyre one year earlier it would have made a big difference to us. We had so much power that the riders just couldn't get any traction. They'd just spin the wheels and burn up the tyres we had then."

In 1979, Erv hooked up with the whiz-kid from Louisiana, "Fast Freddie" Spencer. Spencer had seven years of road racing experience behind him by the time he was 17 and had actually beaten Gary Nixon at a local race in Ohio three years earlier! Kanemoto tuned Spencer's 250 Yamaha in 1979 and his TZ750 in 1980. Then came the choice at the end of 1980.

"Basically, I had a choice for 1981 between working for Honda on American production street-style superbikes and a special dirt track racer, or on Grand Prix racers for Yamaha. To stay in the States and continue working with Freddie or to go to Europe and work with Barry Sheene. I really wanted to do the Grand Prix races. The challenges and the rewards are greater to me personally. I like road racing and the 500cc World Championship is the ultimate.

"Freddie signed with American Honda to do the whole Grand National Championship circuit with them. He would like to be U.S. National Number One." (Editor's note: The American National Championship includes mile, half-mile, short track and TT Steeplechase dirt-track racing, as well as road races for a

total of 30 events during the year.)

"He felt there was a lot of good things for him in the programme Honda is putting together this year. It was the right decision for Freddie now as he has always dreamed of being 'number one.' I really like and admire him as a rider and Honda made me a good offer. But the programme wasn't right for me, now. Working with Barry this year is better for me. I'm really happy."

"It will seem a bit strange, however, not to be working with the American Team (one of whose riders is sure to be Spencer) at the Easter Transatlantic Trophy Match Races. Ideally for me, Barry will take the top individual honors and the American Team will win the event!

"Barry and I first met in 1971 at Daytona and got to know each other in 1973 and the following years when I went to Europe with Nixon. The two are close friends. In fact, Sheene will be flying Nixon to the Match Races this year to spectate."

Erv was asked recently if there were any other riders he would really have liked to work with during the last decade.

"I would have really enjoyed working with Kenny Roberts; he has an amazing mind and always seems to know where he is going on the track. I would also have enjoyed working with Dick Mann, who is an incredible person and all-around rider. And when I was at Kawasaki I would have liked the chance to work with Yvon DuHamel. From what I know of these riders I have a lot of respect for all of them."

Of the present crop of up-and-coming riders, Spencer heads his list, and Erv also rates Mike Baldwin very highly. "Mike has a very professional approach toward his racing and a very positive attitude. I really admire him for that."

Of his own thoughts on racing, Erv says, "Racing is winning. Whatever it takes to win has to be done. One reason I enjoy going to races so much is to see the best men in their field, reacting to situations and handling a lot of pressure. To see racers making the right decisions and doing their job well. I can't imagine all that they are going through, but I can certainly appreciate what they do—the part I can see."

And on the other hand, you can be sure that Erv's talents are viewed just as appreciatively by both his riders AND their rivals.

Call Him

In the 30-year history of International motocross there are really only two or three significant "milestones" that actually changed the face of the sport as we know it today.

One of those must be that period in the mid-fifties when a lanky Englishman named Brian Stonebridge (later tragically killed in a car crash) began to regularly beat the hefty 500cc four-strokes of the period with his spindly little 200cc two-stroke Greeves. Stonebridge and Greeves did more than any of the early two-stroke pioneers to hasten the death of the competitive four-stroke.



"Mr. Monoshock"

Another milestone was undoubtedly the 1973 Belgian 250cc Grand Prix at Wuustwezel, just north of Antwerp. Hakan Anderssen won the race for Yamaha (and went on to clinch the World title that year). He won the race using a chassis that, before the event, was almost written off by the so-called 'experts' as just another gimmick.

The 'gimmick' was Yamaha's Grand Prix debut of the monoshock suspension system developed by Belgian engineer Lucien Tilkens. Compared to the normal suspension systems of the day it certainly looked strange. The rear end of the machine appeared to have a rigid frame. Until you looked closer and saw that this whole sub-frame pivoted and was controlled by an immensely long single shock absorber that ran from beneath the seat right up to the steering head.

The Wuustwezel course was a good test of suspension. Most of it consisted of small, but closely-spaced, ups and downs that never gave the suspension a chance to stop working overtime.

At the end of the race, the Yamaha of Anderssen was such a convincing winner that by the time of the next Grand Prix, all of the other competing manufacturers had hurriedly made attempts at increasing the travel of their rear suspension!

Tilkens' theory in beginning the monoshock design was that too many manufacturers were spending all of their time in searching for horsepower and that this was simply making the big two-strokes of the day unrideable.

He theorized that it was not the actual horsepower that was making the bikes such beasts but the fact that poor suspension was preventing this horsepower from being transmitted to the ground in a controllable manner.

And that is why Tilkens' invention of the monoshock suspension system is such a milestone in motocross history. The appearance of the monoshock forced all manufacturers to revise their suspension systems. This in turn allowed them to use the horsepower at their disposal and has since allowed them to go on and extract even more power from the engines. Every motocross rider today owes Lucien Tilkens a vote of thanks.

It was his introduction of the monoshock chassis that forced all manufacturers to think of handling rather than horsepower and this has upgraded the overall performance of motocross machinery in general.

With the monoshock being patented by Yamaha, other manufacturers had to search for different ways to upgrade their suspension but the result was the same . . . better handling motocross machines able to use more horsepower than ever before.

Lucien Tilkens and his cheerful wife Maria live in a large, immaculate house close by the Grand Prix road race course at Zolder in Belgium.

On just about any working day of the year, Lucien disappears right after breakfast down a tiled staircase to his workshop beneath the house and usually stays there at his drawing board or amongst his modern engineering machinery for anywhere up to 16 hours!

Lucien designed the house (and actually built a good part of it) and an integral part of his design was the cellar workshop. A driveway around the side of the house sweeps down below ground level to the large double doors of the workshop which is crammed with the kind of equipment that would make any machinist's mouth water.

Lucien has always been an engineer and an inventor. For 17 years (from 1951 to 1968) he was a teacher at a technical college near Liege and in 1951 proved his inventive capabilities by coming up with one of the first machines capable of harvesting sugar beet from the ground.

In addition (and like many Belgians) he has always been a big fan of motocross racing.

"In thirty years of marriage Maria and I have probably not missed more than about a dozen big motocross races in Belgium," says Lucien.

"In fact, I've missed more since working for Yamaha than in all the years previously. I'm too busy in the workshop now!"

His enthusiasm for motocross and his penchant for engineering and development also meant that he was for many years on the technical committee of the Federation Motocycliste Belgique, resigning that position in 1971 when he felt that it was not

possible to be involved with Yamaha on a commercial basis and still remain an impartial committee member.

Early in his days as a motocross spectator, Lucien and Maria became friendly with the Geboers family, whose son Sylvain was to become one of the best racers in the world, riding for CZ and Suzuki factory teams.

Knowing that Tilkens was an engineer, the Geboers family persuaded him (without much trouble!) to help in the preparation of Sylvain's racing machinery . . . at that time being big four-strokes like BSA, Lito and Matchless thumpers.

At the same time, he began to help another young motocrosser, a personable young Belgian by the name of Roger De Coster!

As well as high school duties, Lucien also had a small factory making steam cleaning equipment and agricultural machinery such as the sugar beet harvester. After the factory had closed down in the evenings, Lucien and the young riders used to wheel in the motocross machines and work would begin all over again!

By the end of the 1960s, both Geboers and De Coster were riding for CZ. The Czechoslovakian factory had developed a 400cc machine that was proving really difficult to ride due to its brutal engine power and most riders preferred the less-powerful but more manageable 360cc version.

Tilkens, however, was already thinking that the answer to this "unrideability" problem might lie in the suspension rather than the engine power.

His idea was that a stiff rear section, controlled by a single shock absorber, would eliminate the twisting and flexing that the normal twin shock absorber and swinging arm system went through when too much horsepower was applied.

Both Sylvain and Roger were professional motocross riders with a living to earn. They couldn't afford to experiment if failures meant that their incomes suffered.

Lucien, however, had a perfect test rider in the form of his son Guy, who was studying for a degree in mechanical engineering and racing motocross just for fun. He was a capable

Continued on page 13



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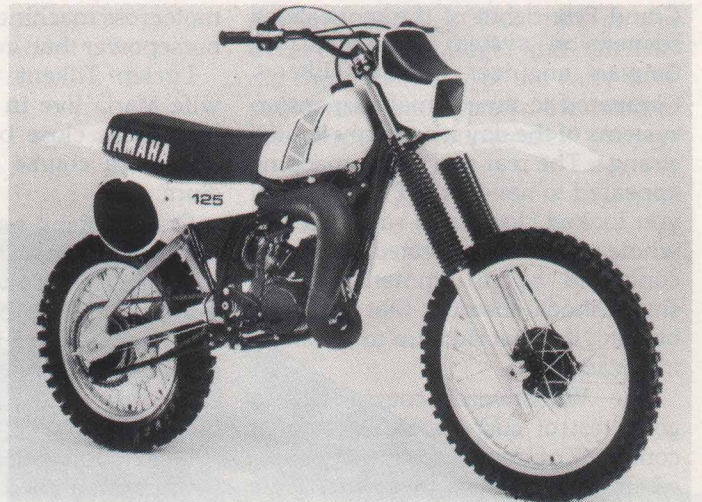
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NOW! AN XS1100 SUPERSPORTS

Yamaha's beefy XS1100 has established a reputation for itself as one of the very best long-distance touring machines on the market. In some ways, however, this good reputation has tended to somewhat overshadow the other aspect of the big twin-overhead cam four . . . the fact that it is one of the fastest, hardest-accelerating sportsters

When it was introduced in 1978, the XS1100 was the first standard production bike to set drag-strip times under 12 seconds for the quarter-mile. Until very recently the supercharged XS1100 dragster of Jim Bernard and Ron Teson in California held the outright world standing quarter-mile record at 7.57 seconds with a 184.42 terminal speed! An XS1100 has won the top-rated race for stock production bikes, the Castrol Six Hour event in Australia. And a French journalist, Fenouil, made a 1,250-mile crossing of the Sahara Desert between dawn and dusk . . . a 12-hr 34m ride from Tamanrasset to Algiers for a 100mph average! On one section, in fact, he averaged 120mph for over 400 miles.

All of these are pretty impressive credentials to back up Yamaha's claim that the XS1100 is a super sporting motorcycle as well as a top-rated tourer.

To emphasise this aspect of the XS1100, Yamaha has come up with an entirely new version for 1981, a "super sports" machine designated the XS1100S.

The XS1100S features leading axle front forks with gold-anodized "Italic" cast wheels; a lower, slimmer tank; a lowered dualseat with raised back-stop and four-into-two exhaust system with short megaphone silencers.

It comes in two colour options. Meanest-looking of the duo is the all-black version with black-chrome mudguards and exhaust system. For those who prefer brighter colours, there is the version with red paintwork and gleaming bright-chrome exhaust and mudguards.

The all-black version comes as standard with a sleek little steering head fairing.

WHY TUNING FORKS?



Yamaha's "crossed tuning forks" emblem is familiar to motorcyclists all over the world—even those not fortunate enough to actually be Yamaha owners! But the origins of the emblem are cloudy. Why tuning forks, of all things, and why three of them?

Most people these days know that Yamaha began life as a subsidiary of the Nippon Gakki Company, who, amongst other things, are one of the foremost manufacturers of musical instruments and equipment in the world.

It is said that the original emblem of crossed tuning forks within a circle was chosen by Nippon Gakki founder, Mr. Torakusu Yamaha, in January 1898. He chose the tuning forks (used to tune musical instruments to perfect pitch) as a symbol of the company's search for perfection. Also, the three forks represented the aim for perfection in manufacture, and harmony and unity of the people within the company.

In 1955, when the Yamaha Motor Company was separated from the main Nippon Gakki empire to become a self-sufficient corporation, a second "inner" circle was added to the logo by Yamaha chairman Mr. Gew Ichi Kawakami. The tips of the tuning forks break through the inner circle to form what looks like a spoked wheel . . . a perfect modification to the original symbol for the new company setting out to conquer the motorcycle business.

Continued from page 11

Call Him "Mr. Monoshock"

rider and was also interested in the mechanics of the competing machinery. And, without the pressure of needing to earn a living from the sport, he could afford to experiment with his father's new chassis.

So, in 1968, the first monoshock chassis was constructed, using Guy's CZ 360 as a basis. For the first three or four years, Guy simply rode the bike in private training and development sessions, but in 1972 Tilkens felt confident enough about his design to enter Guy on a monoshock CZ in a Belgian National race at Paal.

"The reaction of most of the spectators was to think that Guy had lost his shock absorbers," said Lucien. "But the mechanics and other riders noticed that the bike appeared to be handling really well and were quite curious about the design."

They were even more curious later in the year. Towards the end of the season, Tilkens replaced the modi-

fied CZ with a complete chassis of his own, using a Suzuki motor. In its very first race the machine won with ease!

Naturally, because of the close family connections, both Roger De Coster and Sylvain Geboers had seen the monoshock in the making. By this time they were both riding for Suzuki and word about the new-style chassis had been passed back to Japan.

Interest from big manufacturers was not long in coming and Tilkens found himself testing for Suzuki with De Coster and Geboers.

On the very same day as that test, however, Lucien got home and found a message asking him to call Yamaha in Amsterdam. He called them and, obviously, it was the monoshock in which they were interested.

After a series of negotiations, Tilkens decided to go with Yamaha

and, he says, "I have never regretted that decision."

And neither has Yamaha, for within a few months of joining the company, Tilkens had produced the monoshock chassis that took Hakan Andersson to that 1973 Belgian GP win and their first World Motocross Championship!

Since then, the monoshock chassis has proved its worth in all areas of motorcycling. It helped Heikki Mikkola to two World 500cc Motocross Championships in 1977 and 1978; Kenny Roberts, Giacomo Agostini, Steve Baker, Jon Ekerold, Takazumi Katayama and the late Patrick Pons to World Road Race titles; Mick Andrews to a win in the Scottish Six Days Trial; brought ISDT Gold Medals to numerous riders, and is now featured on Yamaha's road bikes from 50cc right up to 1000cc!

The monoshock is very definitely here to stay!

BRAND NEW 250 AND "KENNY HEAD 1981 YAMAHA



TZ250

For over a decade, the Yamaha 250 twin has been the backbone of lightweight class road racing, whether in local "club" racing or at full World Championship Grand Prix level.

Private Yamaha two-fifties have won World Championships and have even kept riders well in the hunt for titles against the pure "factory" machines of companies such as Kawasaki, who prefer to concentrate their entire race resources on a works effort rather than do anything for the private rider.

Yamaha's TZ250 and its predecessors have enabled privateer riders to make a successful profession out of International road racing and the latest version should give the "independents" an even better shot at Championship honours.

The TZ250 has been re-designed in response to pressure from various Rotax-engined machines which are now coming onto the road race scene. In general, the "old" TZ250 was still a match for the newcomers, but it is Yamaha's policy to provide production racers that give their riders a clear advantage over the opposition.

The 1981 version of the TZ250 should do just that! There's also good news for the Yamaha riders in the 500cc class.

This year's TZ500 is a true "Kenny Roberts Replica" with improved chassis and suspension components, re-designed exhaust system and special carburetors plus modifications to transmission and braking systems in the interests of quicker, easier servicing.

TZ250:

In both chassis design and engine configuration, the 1981 Yamaha TZ250 follows the successful pattern set by the TZ500, which has won World Championships for the past three years.

The new machine is not simply an updated, modified version of last year's model. Chassis and engine are completely new components.

The chassis is a complete double-loop, triangulated cradle with widely-spaced front downtubes, allowing the exhaust system to be routed between them and tucked close in underneath the engine for maximum ground clearance while cornering.

Full triangulation of the chassis tubes at steering head and rear suspension pick-up points means increased rigidity and even more predictable handling.

A slightly-reduced caster angle (from 26 to 24.5 degrees), plus increased weight bias towards the front end (from 51.2% to 53%) means more precise steering. Front fork stanchions are thicker for less front-end deflection and are constructed of special "Du-metal" which gives less friction between sliding and static parts.

The monoshock suspension unit retains all its previous features such as initial coil spring ratio adjustment, gas pressure adjustment and different temperature adjustments for the hydraulic valving. In addition, the unit now offers damping adjustment on both extension and compression strokes.

What all this means is that no other motorcycle suspension system can be so finely tuned to adapt to prevailing track conditions. The main body of the shock absorber is now constructed of special lightweight aluminum, with benefits in respect of both weight-saving and heat dissipation. Fitting length of the shock absorber is adjustable to allow

ROBERTS REPLICA" 500 ROAD RACE RANGE



TZ500

changes in seating position. The lightweight, but rigid, rear subframe is fabricated from light alloy sheet and pivots on needle roller bearings. The subframe carries a wider rear wheel (tyre size up from 3.50 x 18 to 3.75/500 x 18) to cope with the added horsepower of the new engine.

The engine unit is bolted into the chassis via floating rubber bushes to minimise vibration. In fact, the whole chassis was designed via a computer analysis which established the best combination of structural rigidity with light weight and low vibration. The new unit is no less than 3 kilograms lighter than the old TZ250 chassis, which, added to a 5kg reduction in engine weight, means a substantial overall weight loss.

As well as trimming the weight of the new TZ250, Yamaha has also slimmed down the machine's width by 30mm and lowered it 15mm. Finally, they have cloaked it in a new fairing with better aerodynamics and an 8% decrease in frontal area.

The totally new design of twin-cylinder power unit is also based very heavily on the successful TZ500 GP machine.

Bore to stroke ratio is "oversquare"

at 56 x 50.7mm and main technical features of the new motor are Yamaha's patented Power Valve System in the exhaust port and the new-for-1981 "zero cutaway" carburetors (also covered by a Yamaha patent). (See separate features on these items.)

Transfer ports are enlarged for more complete scavenging of the cylinder and crankcase, the CDI ignition has increased performance to deal with the higher-revving power unit and the six-speed transmission has a stronger, more precise shift mechanism.

One very important technical change to the new engine is the use of an oil pump for transmission lubrication instead of simply allowing the gears to run in an oilbath.

Because of this, the amount of transmission lubricant around the gears is reduced to one-third of that carried in the old power unit. Quantity is now just 500cc, which means that there is less resistance to the turning gearshafts and, consequently, more horsepower finds its way through from engine to rear wheel.

The new TZ250 engine is even more compact than its predecessor. It is 338mm long, 350mm wide and

175mm high . . . about 10% smaller than the 1980 model.

Great attention has been paid by Yamaha development engineers to ease of maintenance and the facility for quick repair work. Most important for harassed tuners working under pressure in the pits!

The twin cylinder motor is virtually two singles linked together. Breakage on one side of the engine does not necessitate the whole unit being stripped down . . . the mechanic can simply work upon the broken side while leaving the other completely intact.

Cylinders and cylinder heads are totally separate and the crankshaft is in two halves. Each shaft fits into a central gear, from which the power is picked up and passed into the transmission. The water pump is driven via an internal gear and idling shaft.

In addition, all of the ancillary items such as water pump, transmission oil pump, exhaust power valve governor, CDI ignition and carburation components are all separate, independent units which can be replaced with stripped the major part of the engine.

1981 YAMAHA ROAD RACE RANGE

TZ500:

For 1981, the Yamaha TZ500 is a true replica of the World Championship winner used by Kenny Roberts. What this means is that there are no changes to the basic TZ500 specification but a whole lot of detail improvements guaranteed to enhance both performance and handling.

Chassis design has not changed but attention has been paid to increasing rigidity at both steering head and swinging arm pivot via improved frame gusseting and needle roller pivot bearings.

New wheel rim designs add torsional strength in this area and front rim size has been increased from 2.15 to 2.50 inches, accommodating a 3.25 x 18 tyre.

The new shock absorber with two-way damping adjustment (see TZ250 text) is also fitted to the TZ500, as are the anti-friction "Du-metal" fork tubes. To enable the rider to easily tune his front suspension, the forks have an initial coil spring adjuster.

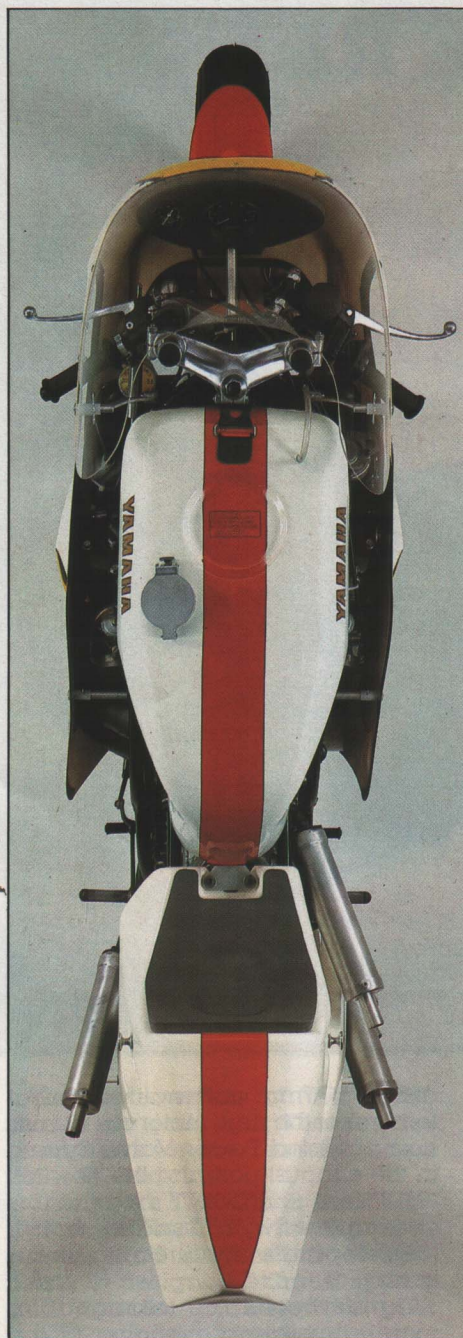
Rear wheel and brake assembly have now been made quickly-detachable so that experimenting with tyre rubber compounds now represents less of a chore for the mechanics.

The exhaust power valve is again fitted to the TZ500 and for 1981 it is complemented by the new "zero cutaway" carburettors. As a result, the water-cooled four-cylinder engine is highly responsive to throttle control.

Tucking away the bulbous expansion chamber exhausts on any multi-cylinder two-stroke is always a problem and sometimes compromises have to be made in terms of power output just so that the bulky exhausts can be accommodated without hindering ground clearance or rider comfort.

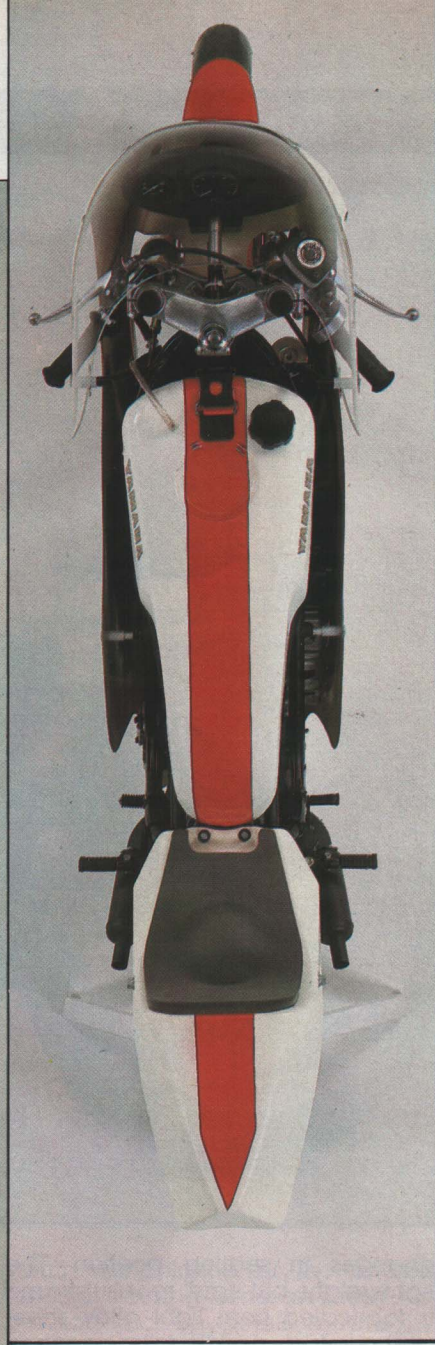
This had been the case with the left-hand cylinder on the 1980 TZ500. Exhaust efficiency did not quite match that of the other cylinders, simply because the shape of the exhaust pipe was dictated by the space available.

For 1981, Yamaha engineers were able to make some changes to the exhaust shape which allows it to provide efficiency on a level with the other three cylinders. The pipe turns across the top of the transmission and exhausts on the right side of the machine. The result of this im-



Centre: The compact bulk of the 1981 Yamaha TZ500

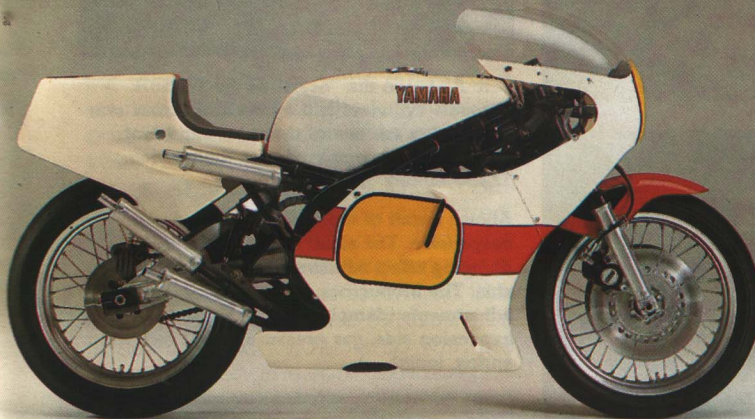
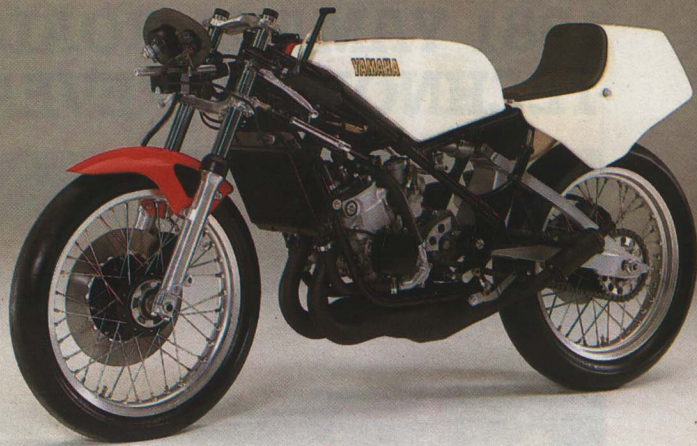
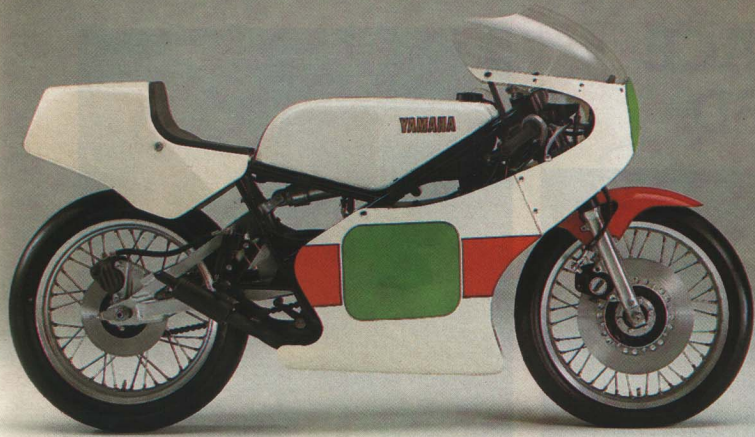
Right: The slim-line TZ250



proved exhaust efficiency is better torque and more power in the mid-range.

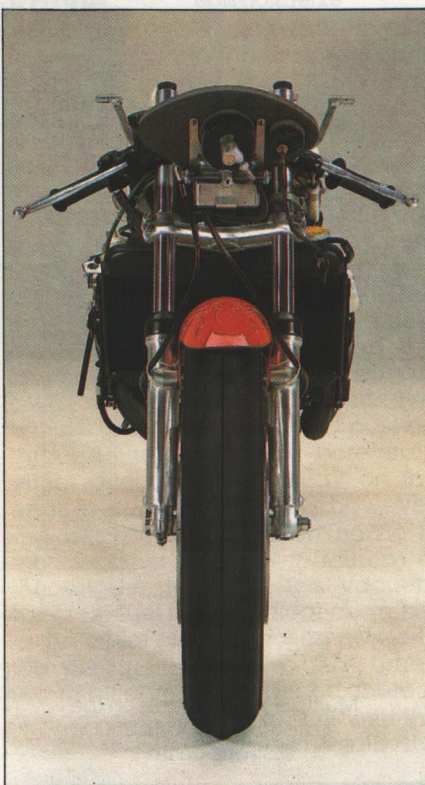
Finally, twin sealed-type bearings on the clutch assembly aid smoother operation and reliability in this area.

So... not a great many changes for the 1981 TZ500 but some very significant ones in making the bike a truly effective weapon for the privateer in the biggest class of championship racing.



Top: With or without fairing, the TZ250 looks light and lean.

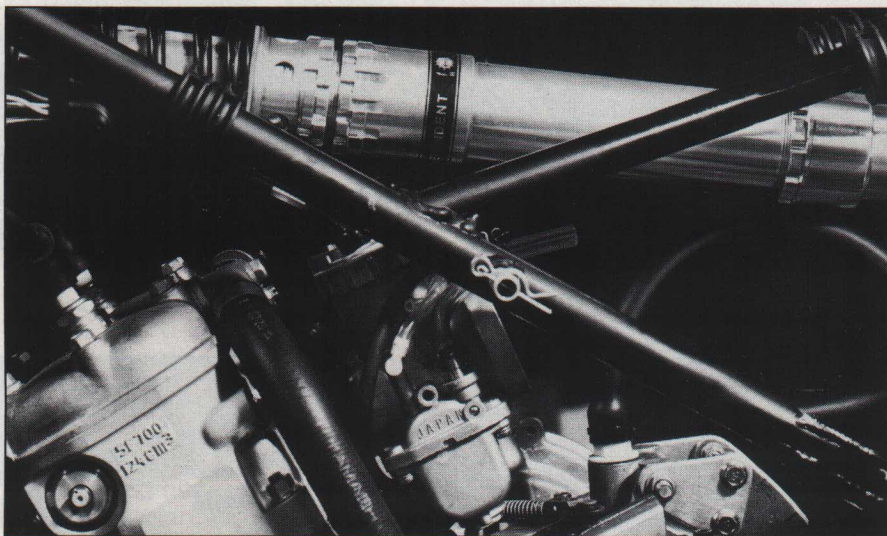
Centre and Below: The mass of machinery crammed into the compact TZ500 chassis emphasises its brute power.



SPECIFICATIONS

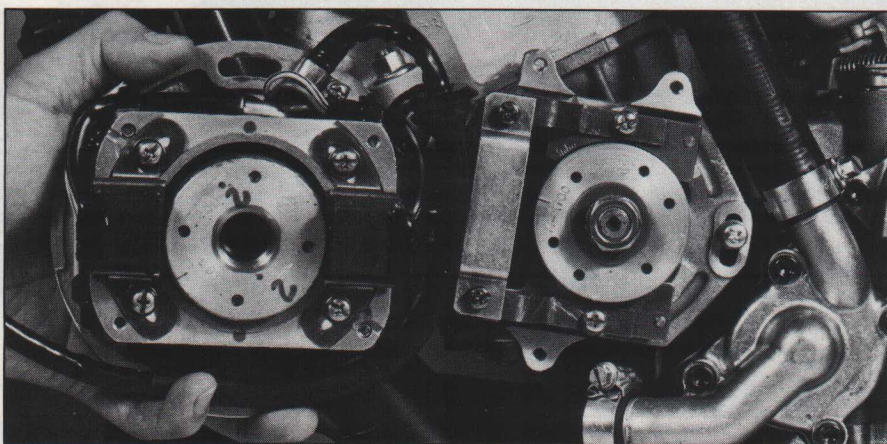
ENGINE	TZ500	TZ250
Type	Water-cooled 2-stroke piston valve 4-cylinder with YPVS	Water-cooled 2-stroke piston valve twin with YPVS
Displacement	499 cc	249 cc
Bore x stroke	56 x 50.7 mm	56 x 50.7 mm
Compression ratio	7.9 : 1	7.9 : 1
Max. power output	Over 110 PS (10,500 rpm plus)	Over 55 PS (11,000 rpm)
Max. torque	7.7 kg-m (10,250 rpm plus)	3.6 kg-m plus (10,750 rpm)
Carburettor	4-Mikuni VM34	2-Mikuni VM36
Ignition	C.D.I.	C.D.I.
Lubrication	Pre-mix	Pre-mix
Radiator capacity	2.3 lit.	1.2 lit.
Transmission	6-speed gearbox	6-speed gearbox
CHASSIS		
Overall length	2,020 mm	1,950 mm
Overall width	500 mm	615 mm
Overall height	1,125 mm (with cowling)	1,110 mm
Seat height	780 mm	750 mm
Wheelbase	1,365 mm	1,320 mm
Min. ground clearance	120 mm	150 mm
Dry weight	138 kg (with cowling)	106 kg (with cowling)
Frame	Double-cradle tubular type	Double-cradle tubular type
Caster	27°30'	24°30'
Trail	108 mm	87 mm
Front suspension	Telescopic fork	Telescopic fork
Wheel travel	130 mm	125 mm
Rear suspension	Mono-cross	Mono-cross
Wheel travel	135 mm	135 mm
Front tire	3.25-18-4PR	3.00/3.75-18-4PR
Rear tire	4.00/5.75-18-4PR	3.75/5.00-18-4PR

1981 YAMAHA ROAD RACE TECHNOLOGY REVEALED:



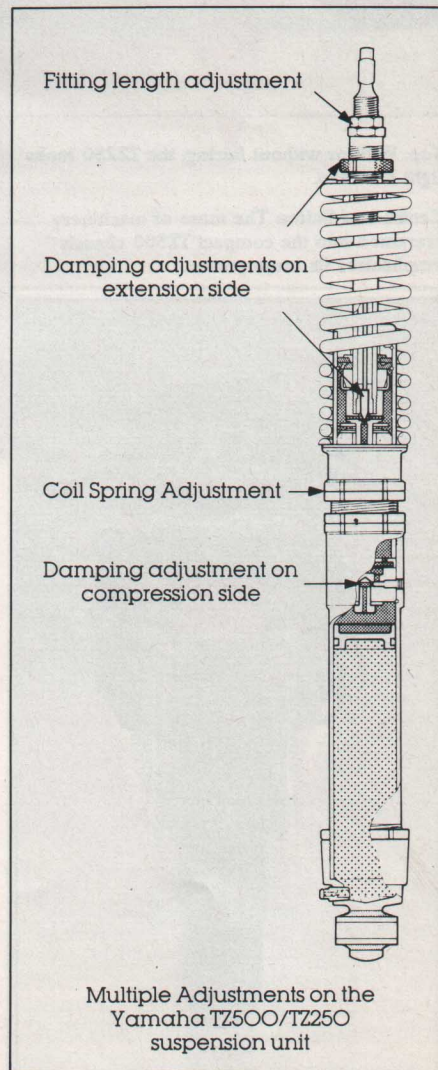
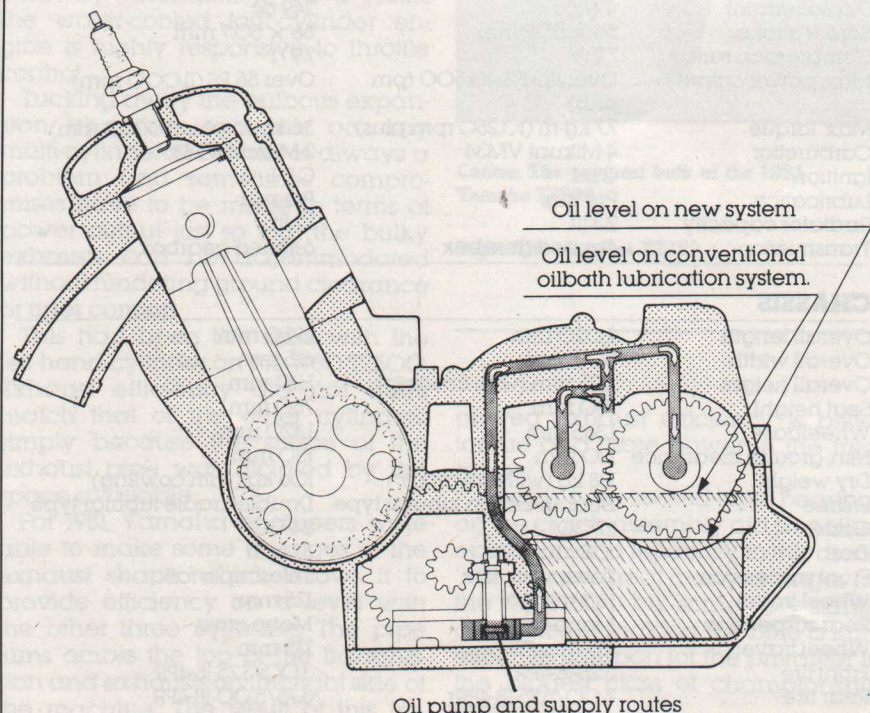
Left: A shot in the "heart" of the TZ250H. Separate cylinders and a new Monocross rear suspension are two of the most important modifications, compared with the previous TZ250 model.

Above: Detail of the Monocross rear suspension. The small screw allows the damping effect adjustment on the contraction side. The Monocross allows many other adjustments (damping effect on the expansion side, gas pressure, initial coil spring, length ...)



The new C.D. ignition unit is really small and compact, compared with the previous unit.

NEW TRANSMISSION LUBRICATION SYSTEM IS PRESSURE-FED ON THE TZ250

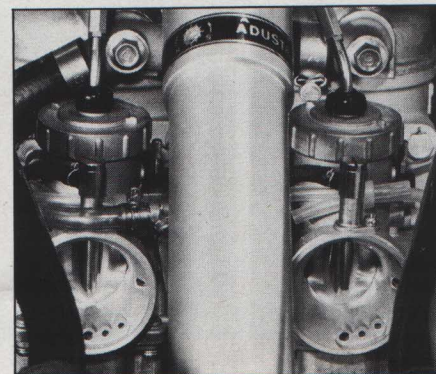
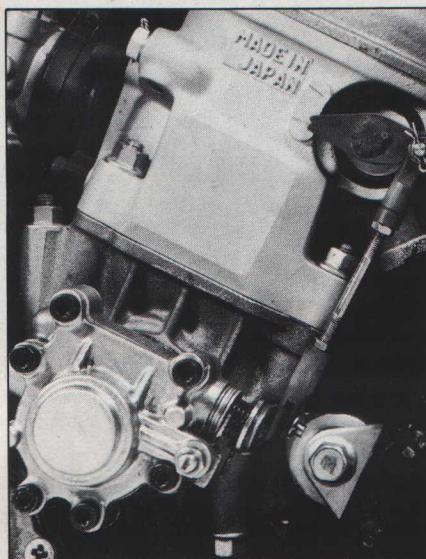
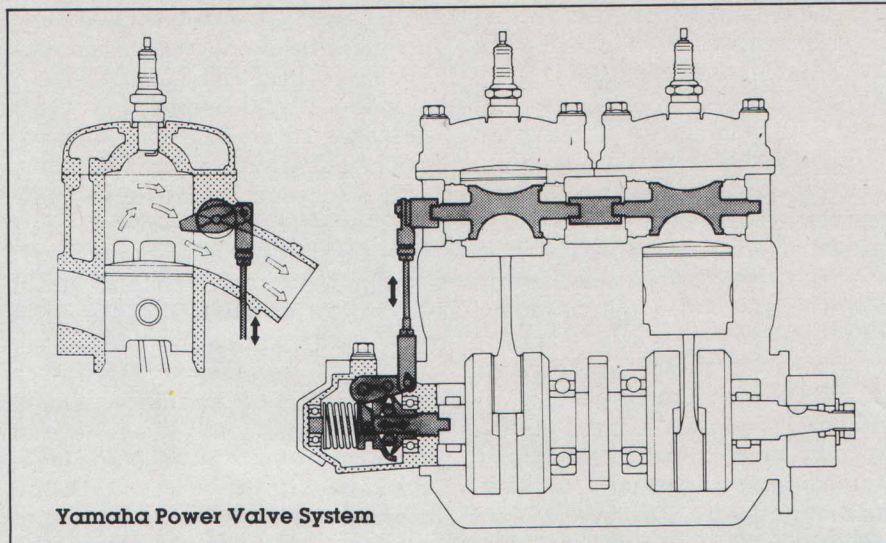


Yamaha Power Valve System:

The YPVS is a unique exhaust timing adjuster which helps maintain a smooth delivery of power at all engine speeds. Basically it is a cylindrical unit which mounts laterally across the top of the exhaust port. A cutaway portion of this cylinder varies from a shallow dish shape to semi-circular so that it can obstruct the full opening of the exhaust port by varying degrees.

The unit is connected via an exterior linkage to a special drive system off the right-hand end of the crankshaft. The faster the crankshaft spins, so centrifugal force forces this drive unit outward against its controlling coil spring. As the drive system is forced outward, it activates the linkage to the unit in the exhaust ports, rotating it in proportion to the changes in engine rpm. At low rpm, the shallow section of the cutaway is rotated into line with the top lip of the port. This reduces port area and provokes later discharge of the exhaust gases. At full throttle, the largest cutaway is rotated into the port area, which effectively means that the port is opened to its original maximum. The amount of restriction that the unit presents in the exhaust port varies in direct relationship with the amount of engine rpm. Exhaust timing is therefore totally variable and matched exactly to throttle opening.

The net result to the rider is an engine that has a turbine-smooth power delivery at all engine speeds, which is most important when your throttle hand is controlling the release of over 100 horsepower!



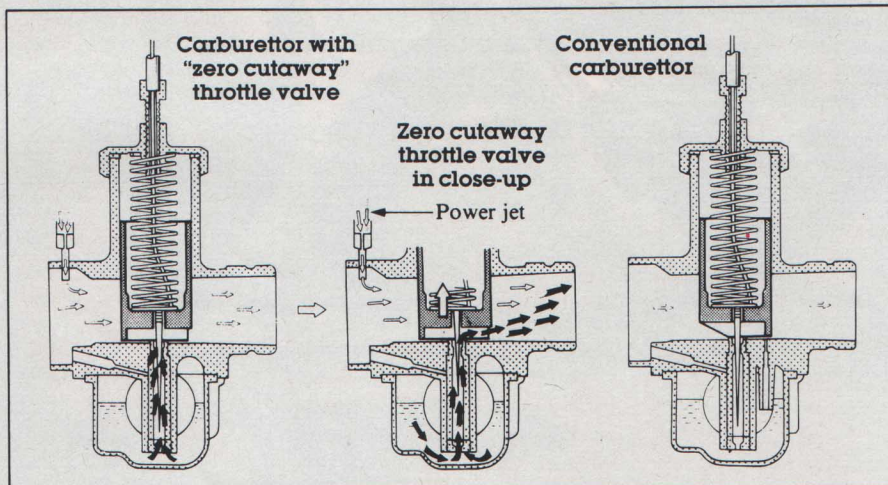
Top and left: The new TZ250H and the TZ500 engines are fitted with the Yamaha Power Valve System.

Above: The new TZ250 engine is fed by two Power-Jet Mikuni VM36 carburetors, equipped with a patented cutaway throttle valve.

Zero Cutaway Throttle Valve:

The new "zero cutaway" throttle valve, as fitted to the racing carburetors on Yamaha's TZ250 and TZ500, is designed to keep the fuel level raised to the level on the injection nozzle in the carburetor bore, even when the throttle is fully closed.

Normally a throttle valve has a cutaway on the side facing away from the engine. The valve completely closes off the carburetor bore on the engine side when the throttle is fully closed. Yamaha has reversed this arrangement. Now there is no cutaway on the outer side of the valve, which prevents air from passing through the carburetor bore from either direction. A cutaway on the engine side of the valve, however, exposes the fuel injection nozzle to the negative pressure (vacuum) in the engine. In effect, this vacuum sucks up fuel from the float chamber to the outlet of the injection nozzle in the carburetor bore so that, when the throttle valve is opened, there is already fuel waiting to mix with the inrush of air on its way into the engine.



Normally, it is that inrush of air across the injection nozzle which sucks fuel from the float chamber to create the fuel/air mix that eventually combusts in the cylinder.

We are talking of milli-seconds in relation to this "time lag" in the mixture of fuel and air via the conventional carburetor. Just the time that it takes for fuel to rise up the nozzle from float chamber to carburetor bore.

That time lag, however, still reduces carburation efficiency. The

advantage of using the engine vacuum to suck up fuel from the float chamber and have it "ready and waiting" to mix with the incoming airflow is that it makes the engine highly responsive at any throttle opening.

This sensitivity of response on the induction side combines ideally with that same advantage offered by the YPVS on the exhaust cycle to make the new Yamaha engines deliver their power in the smoothest way possible.

The Yamaha YZ465 had several distinctions when it first appeared for the 1980 season. It was the biggest production motocross racer ever made, was more than a match in terms of suspension travel and adjustments for any of its rivals and, above all, was the first "over the counter" motocrosser to boast over 50 horsepower at the crankshaft! In both chassis and engine departments, the YZ465 was a complete departure from the already-successful YZ400 which it replaced.

It didn't take long for the totally redesigned motocrosser to develop a reputation as the most powerful and, more importantly, the best 500cc-class motocrosser in recorded history. The YZs went on to become a dominant force in motocross competition. Marty Moates even won back-to-back 500cc Motocross World Championship motos in Carlsbad, California aboard a modified YZ465.

He decisively beat the best bikes and riders in the world with a production-based machine. That's something that NEVER happens in world class competition, and it's a tribute to how good the YZ465G was.

But time and motocross technology march on. It was obvious that the other manufacturers weren't going to be content to be outclassed by Yamaha again in 1981. The other three Japanese manufacturers have introduced reworked and, in some cases, totally new machinery. Kawasaki has fiddled with the KX420 in hopes of making it more competitive. Suzuki has shown their new RM465 in Europe; it has an extra helping of

displacement this year, along with Suzuki's new single-shock rear suspension system. And, of course, there's the all-new Honda CR450R. Honda's first production open-classer is equipped with their new Pro-Link rear suspension system, and is claimed to churn out over 50 hp at the crankshaft.



All action with the Yamaha YZ465. Yellow and black paintwork is strictly for USA market but the bike is otherwise identical to European production models.

The guys at Yamaha knew that their world-beating YZ465 was going to be challenged from all sides for 1981, so they've tried to build enough changes into the new H-model to keep it a wheel ahead of the others, no matter how formidable the motocross competition might be.

Until we get a chance to test the other new open-classers, we won't be able to tell you how they stack up against the YZ465H. But we can tell you that this newest rendition of Yamaha's earth-shattering 465 is a hair faster, easier to ride, and more durable than the original. It's going to be very difficult for the other manufacturers to top this new YZ.

YAMAHA YZ465

The rip-snorthingest, sand-slingingest, knob-rippingest, turf-chunkingest monstercrosser ever to wrinkle the crust of the earth . . . so far



The 1980 Yamaha YZ465 in familiar red and white European trim.

Guest Test this issue comes to us courtesy of "Motorcyclist"—one of the "big four" bike magazines in the USA and one of the longest-established motorcycle magazines in the world, having been around almost as long as motorcycles themselves. This test report was first published in January, one of the very first complete tests on the 1981 version of the latest Yamaha YZ465 motocrosser. Apart from the "American" yellow and black paintwork, this version of the YZ465H is identical to the European model.

The heart of the biggest YZ has received only a few changes for 1981. The 465cc powerplant still has the same 85 x 82mm bore and stroke dimensions and a 7.0:1 compression ratio. The aluminum two-ring piston strokes in a steel-sleeved cylinder which now has revised port dimension. Mixture still comes through the same six-petal reed cage but is now fed into the cases through a fractionally higher, wider intake port. Spent exhaust gases pass out through a wider exhaust port and into an entirely new exhaust system. Last year, the YZ's head pipe had a bulge built in that was claimed to extend the exhaust cycle's blow-down period. As it turned out, the Yamaha engineers weren't altogether pleased with the bulge's results, so it is gone this year.

Yamaha says that the porting and pipe changes are worth a few extra horsepower this year, but the dyno

shows only a small gain in peak power. Last year the YZ peaked out with 41.92 hp at 7000 rpm, measured at the rear wheel. This new set-up spins out 42.18 at the same rpm, with no less than 52 hp at the crankshaft. The peak torque output is actually down a little this year.

The old motor was good for 34.51 foot-pounds of torque at 6000 rpm, but now that figure has dropped to 33.80. Both engines were run with stock jetting on the dyno. However, the 1980 model was running a hair cleaner at full throttle than our '81 test bike. The power comes on a little differently, too. Both engines will pull cleanly from 2000 rpm, but from there until 4000 rpm the YZ-H has a horsepower and torque advantage. Then from 4500 rpm until 6000 rpm, the tables turn. There, the old G powerplant outpowers the new motor slightly. From 6500 rpm on

up to 8000 rpm, the roles reverse once again, and it's the new engine that pulls the most load.

On the track, the subtle changes in the YZ's powerband actually make the engine more predictable and a little easier to control. It pulls just a tad harder right off the bottom and then comes on a bit more gently than the old motor did at 4500 rpm. When you really want it, there's just a shade more peak power at your disposal. The power builds more gradually now. The difference is slight, but it does make the YZ more controllable in the hands of a novice or intermediate rider.

Besides the changes to power-producing parts, the YZ465's transmission got the once-over to improve durability. First gear now has stronger engagement dogs to prevent the breakage that occurred on some 1980 465s. The gearbox breather has now been relocated to the clutch



YAMAHA YZ465

**“... best production
500cc class motocrosser
in recorded history!”**

pushrod actuating shaft. Previously the breather was above the kickstart idler gear, which had a habit of slowly slinging the gearbox oil out through the breather, requiring the level to be checked frequently. The problem should be eliminated with the new location. The clutch-pushrod-actuating cam is shaped differently, too. It provides a lighter lever pull and a somewhat narrower clutch engagement point than the old cam did.

Last year the YZ sometimes proved hard to start, especially for shorter riders. The 465's distinctive backfire while being kicked through became almost as well known as the bike's prowess on the racetrack. To make the bike easier to start, the CDI has been changed to provide a hotter low speed spark. Getting the 465 to fire still takes a little bit of skill, but once you have the knack, two or three hard kicks will normally get it running. If you do everything just wrong, though, it is still possible to rip off an ear-splitting backfire.

The 465cc powerplant bolts into a Japanese chromoly chassis that looks nearly identical to last year's, but actually incorporates a number of changes. It's now welded up out of tubing with thinner wall thickness to reduce weight. The aluminum swing arm is unchanged and still pivots in needle bearings. The folding cleated footpegs are now 10mm higher to give the rider's feet a bit more ground clearance.

Up front, the YZ's steering stem is now hollow but still rides in sturdy tapered Timkin bearings. It's held at a steeper angle, too. The original 465 had slowish steering geometry by current standards. Its stem was set at 30 degrees, and trail was 5.12 inches. Now the rake has been tucked in 1.5 degrees and the trail is a bit shorter at 4.72 inches. These changes are aimed at making the YZ more nimble and precise in the corners.

And to make it work better in the big bumps, there's a completely new fork assembly. The old 38mm dia-

meter stanchion tubes are gone, and now a pair of 43mm tree trunks take their place. A total of eight pinch bolts secure them in the new triple-clamps. Suffice it to say that fork flex is not a problem with the YZ465H. The new fork uses larger diameter springs, and has more compression damping. Near full-extension it's about the same as last year's, but towards full-compression it stiffens up more in comparison to the old fork.

To make sure that the Monoshock is a match for the new fork in the rough stuff, it has received a number of changes, too. The suspension geometry and shock mounting points are still the same, but now the stock has roughly 10 to 15 percent less compression damping in relation to the rebound damping. And the damping can be adjusted over an even wider range. There's a total of 24 usable damping settings on the new shock, as opposed to 18 on the old unit. In addition, the Mono's remote reservoir has increased in size to provide greater oil and nitrogen gas capacity.

The front wheel assembly is essentially the same and still stops with the same excellent double-leading-shoe front brake. The back wheel is still fitted with a fully floating single-action drum, but the drum diameter has been decreased in size 10mm and is now 150mm. This makes for a small reduction in weight, and makes the brake a bit less powerful. It's the same brake used on the YZ250 this year. A bigger rear axle is now used on the 465 also.

Everyone knows that the original YZ465 gave the rest of the open class machinery a thrashing that they won't soon forget. But just how much better is the new version? Quite a bit really. It's a better motocrosser but not really too much faster. The new YZ has made most of its gains in suspension adjustability and general durability. It works just a little better in almost every respect—enough so that the new YZ can cut faster laps in stock form than the

original could. But if you've got a 465G sitting out in your garage, you don't necessarily need to rush out and sell it just yet. A few well-selected modifications to your old bike will make it a match for the new scooter on most courses.

Last year's YZ465 was the best production open-class motocross bike of all time, and now it's even better. The monumental horsepower is still present in full force. The YZ makes so much power over such a wide rpm range that first gear is almost never needed, even in the pits. On most tracks, second is hardly ever necessary either. Even dead slow hairpins can be navigated in third gear, provided you're sharp enough to keep the engine from stalling—just keep the throttle open a hair and the Yamaha simply idles through. Then on the exit, yank the throttle open and there's instant power. It won't spin the rear tire right off the bottom, but if you do want to leave a corner a bit faster, just fan the clutch once or twice. That gives the 465 a chance to get up in the mid-range. Anytime, any place on the track, when the YZ is pulling through the mid-range at full throttle, you will find yourself accelerating VERY quickly with a rooster tail about the height and length of the Great Wall of China trailing behind you. Don't ever ride in front of any of your friends on the YZ465, because after you give them a couple of gravel-blastings they won't be your friends anymore!

On our test tracks, the Yamaha was the most predictable and fastest when kept in third and fourth gear. Those two cogs cover a speed range from about 10 to 60 mph. You might have guessed that the bike doesn't need to be shifted very often. With the tough, predictable clutch and the bike's fearsome power, third gear starts are routine, fourth gear launches practical in some situations, and unbelievable fifth gear blast-offs possible at times—but for amusement purposes only. The YZ465's motor is simply astounding: all the power any semi-sane person could ever want, delivered in a predictable, easy-to-control fashion. The gearbox shifts smoothly with or without the clutch, and the ratios work well with the powerband.

The Yamaha's chassis really does its part to help you put all of that horsepower to use without getting upside down or dead. The new over-size fork is virtually flex-free, and works admirably on almost all types of terrain. It's sensitive to small ripples, and then stiffens up enough to

YAMAHA YZ465

**"... best production
500cc class motocrosser
in recorded history!"**

handle deep whoopers and hard jump landings. It exhibits just a bit of harshness on hard-baked, square-edged bumps, but the action could be easily smoothed out with minor changes in oil level or viscosity.

The 465H is proof positive that Yamaha has finally ironed out many of the Monoshock's previous problems. We backed the damping adjuster out two clicks from the stock position and were treated to some of the best suspension action we've encountered. The lighter compression damping built into the shock gives it the ability to completely suck up the ripples and stutter-bumps without feeding a lot of harsh jolts to the chassis and rider. You can get on the gas hard on rough ground and the YZ behaves. With the smooth power and supple suspension, the bike is a predictable slider, even through rough corners. Fast charges through knee-deep whoopers pose little problem for the 465. If you keep your weight to the rear, the bike tracks

straight and feels stable—even when you're using up all of the suspension travel at each end.

As delivered, the 465's suspension is set up almost perfectly for a 160-pound beginner or intermediate rider. But if it doesn't suit your tastes, you'll discover another one of the Yamaha's good points: adjustability. The YZ's suspension components are adjustable in so many different ways that the machine can be dialed in perfectly for almost any rider and almost any track. There are the usual air pressure, oil viscosity and oil level adjustments in the fork. And the Mono's damping and preload adjustments cover a tremendous range. You can even fiddle with the Mono's nitrogen pressure if you know what you're doing. And if somehow you can't get your YZ to work the way you want using all of those adjustments, Yamaha offers accessory fork and shock springs that are both softer and firmer than stock.

Given the exquisite suspension action, it's little wonder the YZ handles so well. The new steering geometry gets the bike through the corners quicker and more precisely. The front end sticks better now, thanks to the good tires and steeper head angle. You can turn inside most other

motocrossers and the Yamaha has the versatility to monorail around high-banked berms or slice down on the inside, whichever you choose.

The YZ stops as well as it goes. The brakes are excellent, particularly the double-leading shoe-front stopper. A two-fingered squeeze can lock the wheel, but there's plenty of feedback through the lever to keep you from doing it accidentally. The smaller diameter back brake is an improvement. It's less sensitive now, so it doesn't lock unexpectedly. There's no problem with brake-induced wheel chatter when braking either.

In fact, there's no problem with anything when riding the YZ465H. The bike simply doesn't do anything wrong. Naturally, it's not perfect, but it's closer than any other open-class bike we've ever ridden. The secret to going fast on the Yamaha is learning to use as much as possible of what the bike has to offer.

We'll soon see whether the other manufacturers can come any closer to perfection with their 1981 models than Yamaha did with this latest 465. There's almost no way that any of the other bikes can be MUCH better. The lines are already forming outside of all the Yamaha dealers. We'll save you a spot. □

IT'S WHAT YOU CAN'T SEE THAT'S SO SPECTACULAR.

This is the N31 MkII, the most expensive helmet we make. On styling alone it's superb. On price it's phenomenal, under £55. But as with all Nolan helmets it's the hidden details that really put it ahead of the pack.

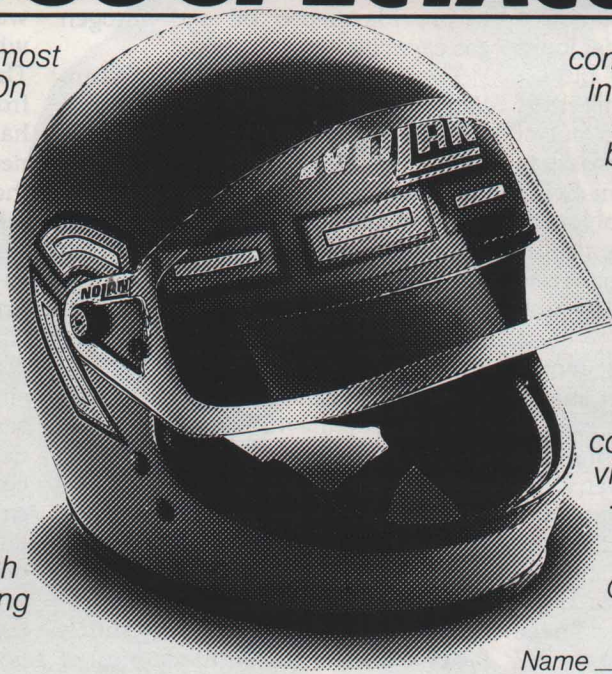
Such as the ratchet visor that clicks firmly into any of three positions.

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And the fantastically tough glassfibre tissue shell, so strong it exceeds BS2495 for impact resistance by four times.

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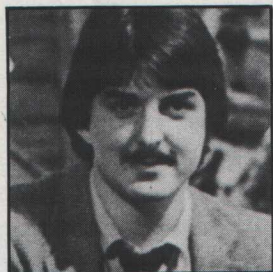
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Super-smooth, enormously powerful



So said Mark Price in 'T + MX News'. And he wasn't talking about Ronald Reagan.

Testing the new YZ 465 motocross bike in Belgium, he pronounced it "the smoothest open-classer around".

He said it pulled "like a train from way down low in the rev range, right through to maximum power output."

And he threw in lots of nice stuff about "raw horse-power" and the "enormous motor," producing "even more torque."

Mark was not alone. Writing in 'Motor Cycle News', AMCA expert Colin Hill called the YZ 465 "a brilliant advert

for Yamaha's production prowess."

He enthused about the bigger 43mm forks, the new rolling chassis and the revived rear shock that gives thirty adjustment points.

He raved about the brakes, too, calling the front twin leading shoe-stopper "probably the finest motocross brake I've encountered."

All told, Mark and Colin were knocked out by our new 465. And they rushed into print even before we had time to tell them about the free parts kit.

(It's worth £150, and includes spare piston rings, drive and rear sprockets, main jets, head gaskets and Monoshock suspension springs.)

Anyway, a sincere 'thank you' for the report, lads. It wouldn't have sounded half as convincing if we'd said it ourselves.



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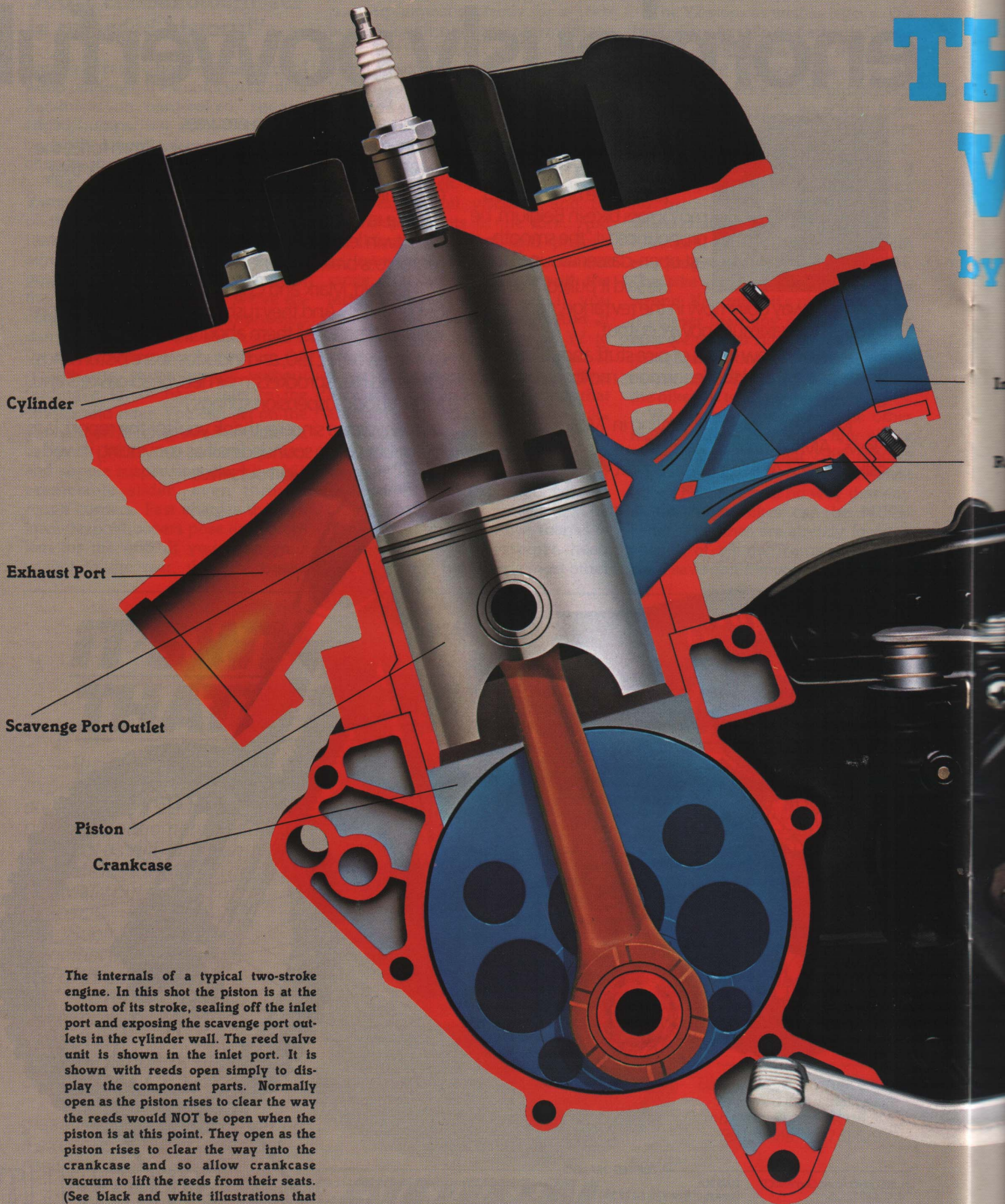
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YAMAHA
When you know
how they're built.



Cylinder

Exhaust Port

Scavenger Port Outlet

Piston

Crankcase

The internals of a typical two-stroke engine. In this shot the piston is at the bottom of its stroke, sealing off the inlet port and exposing the scavenger port outlets in the cylinder wall. The reed valve unit is shown in the inlet port. It is shown with reeds open simply to display the component parts. Normally open as the piston rises to clear the way the reeds would NOT be open when the piston is at this point. They open as the piston rises to clear the way into the crankcase and so allow crankcase vacuum to lift the reeds from their seats. (See black and white illustrations that accompany this feature.)

THE REED VALVE— WHY AND HOW

by Ed Scott

The term "Torque Induction" is a familiar one to motorcyclists, particularly so to two-stroke enthusiasts. It is the name that Yamaha has given to the reed-valve unit which controls the induction process on their two-stroke engines.

Motorcyclists are also quite familiar with the words "reed valve." What many of them are perhaps not so familiar with is just how the reed valve does its job. It's one of those parts of a motorcycle which gets mentioned a lot in sales literature and specifications but never really fully explained.

"The new Brand X has reed valves," say the salesmen. But they don't say why it has them . . . or exactly how they do their job.

The reed valve is basically a check valve which allows the pas-

sage of air in one direction only.

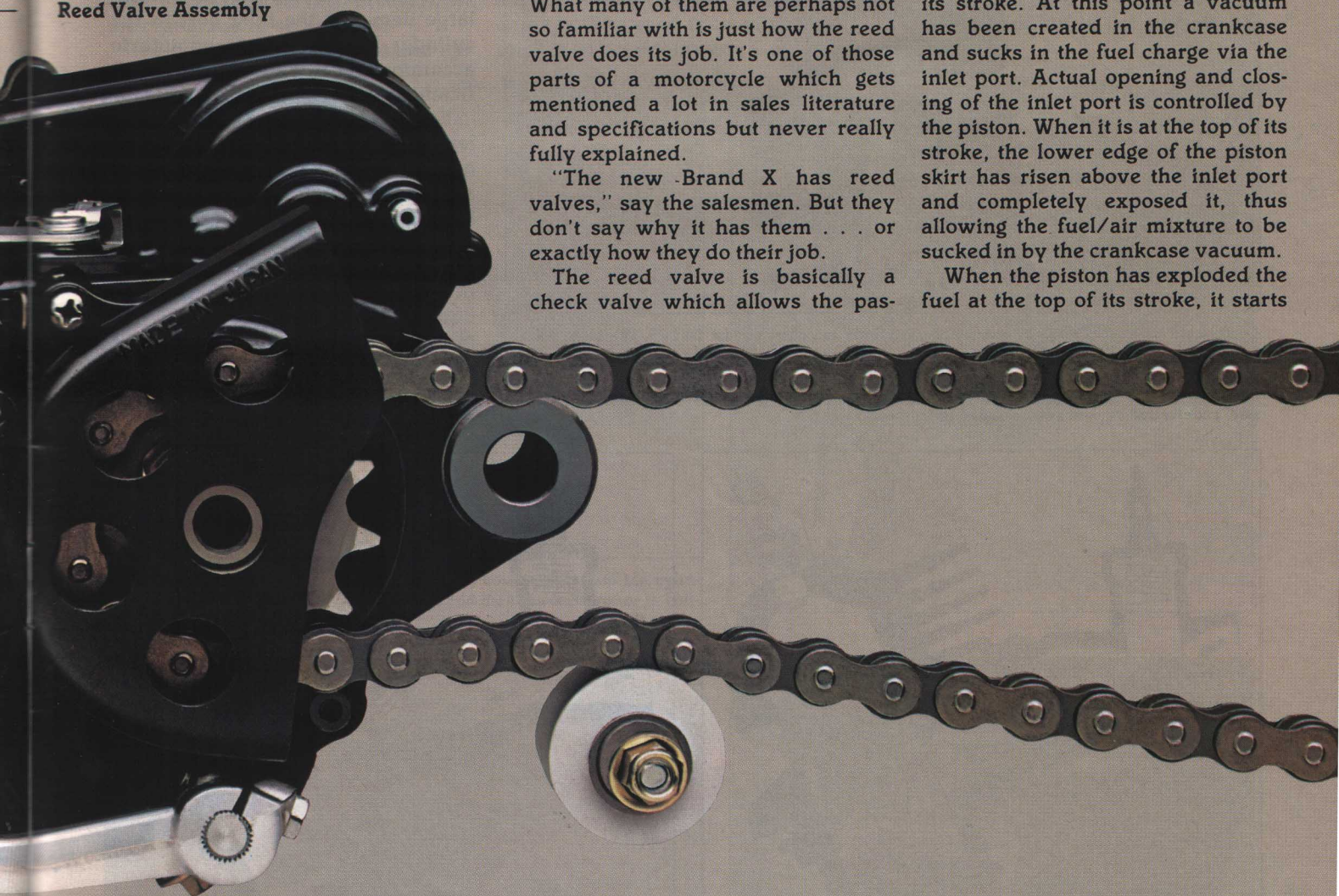
Just why it is situated in the two-stroke's induction tract is a topic which should first be preceded by a brief outline of the way a two-stroke actually works.

The two-stroke engine takes in its fuel/air mixture from the carburetor when the piston is at the top of its stroke. At this point a vacuum has been created in the crankcase and sucks in the fuel charge via the inlet port. Actual opening and closing of the inlet port is controlled by the piston. When it is at the top of its stroke, the lower edge of the piston skirt has risen above the inlet port and completely exposed it, thus allowing the fuel/air mixture to be sucked in by the crankcase vacuum.

When the piston has exploded the fuel at the top of its stroke, it starts

Inlet Port

Reed Valve Assembly



THE REED VALVE— WHY AND HOW

downward and allows the exploded gases to rush out of the exhaust port. At the same time, the descending piston pressurizes those fresh gases which are in the crankcase.

At the bottom of its stroke, the piston crown has cleared the opening of the scavenge ports in the cylinder. These ports run down through the cylinder walls to the crankcase and the opening of them allows the pressurized fuel from the crankcase to rush through into the combustion chamber.

Then the piston rises to compress and ignite the fuel, opening the inlet port to allow the whole process to begin again.

For the two-stroke engine to perform all of these functions properly, the crankcase must be sealed at every phase of the operation so that the alternating conditions of pressure and vacuum occur to their maximum efficiency.

One of the biggest causes of a drop in crankcase pressure is backflow from the crankcase through the

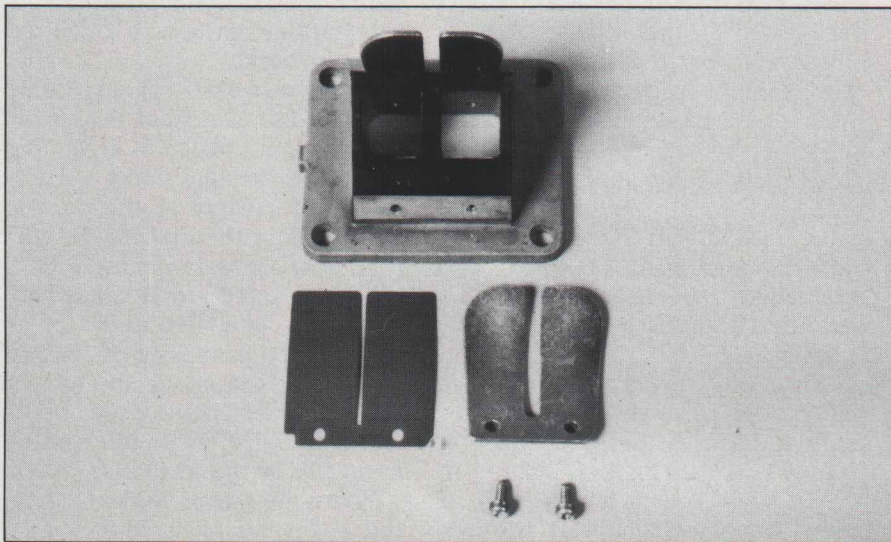
inlet port into the carburettor. As well as causing a drop in crankcase pressure, the backflow of pressure into the carburettor also interferes with the fresh fuel/air charge coming into the inlet port. This results in erratic carburation, particularly low in the rev range.

As a result, the insertion of a one-way valve—the reed valve—in the induction tract is obviously highly desirable. Not actually necessary for the functioning of the engine but certainly a valuable asset in the search for maximum efficiency. The reed valve allows passage of fuel from the carburettor but eliminates flowback and seals the inlet tract to maintain crankcase pressure.

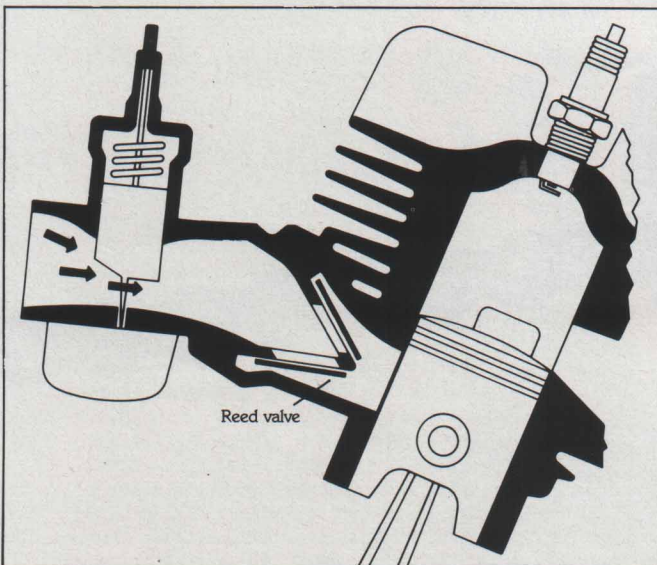
A reed valve induction system operates most efficiently and with maximum performance when it is designed specifically for a certain engine and its specific requirements. This takes place during the early stages of engine design and development at the Yamaha factory. The reed valve assembly is a fairly large item and the inlet port in the cylinder has to be large enough to accommodate it while allowing sufficient air flow.

Yamaha has been the industry leader in the design, development and use of reed valves in their two-stroke motorcycles. All of the bikes in their current two-stroke product line use the reed valve Torque Induction system. These models include the road-going RD250/350 liquid-cooled twins, the YZ, IT, DT motocross and enduro bikes and even the TZ road racers.

After-market "bolt-on" kits are available for some engines but they



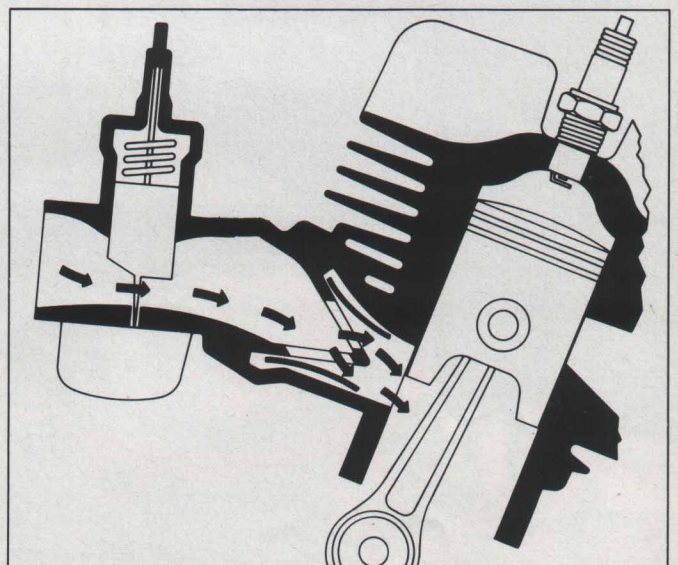
Component parts of a typical reed valve assembly (as used on the DT175 Yamaha). The housing is made of a semi-soft plastic type material to allow firm seating of the reeds. These are at lower left while the curved metal plates which bolt above them to restrict reed movement are on the right. This block has four inlet passages (two on each side of the "pyramid") controlled by four reeds, linked in tandem.



Reed valve

HOW THE REED VALVE IS OPERATED:

In the picture at left, the piston is at the bottom of its stroke and has closed off the inlet tract from the crankcase. Pressure in the inlet tract has seated the reed valves on their housing, preventing the passage of fuel.



In the picture at right, the piston has risen to the top of its stroke and opened the inlet tract to the crankcase. Negative pressure (vacuum) in the crankcase lifts the flexible reeds from their seats and allows in a fresh charge of fuel/air mixture. The process then repeats itself constantly.

never seem to perform as well as a system designed to work with a specific engine from the very beginning. A kit can be adapted to a cylinder not designed to accommodate a reed valve but it is expensive and the results are sometimes less than desirable.

The reed valve assembly is usually in the shape of a pyramid and consists of three basic parts. The body or holding fixture, a set of thin high-strength flexible stainless steel reeds and a set of reed stops. The reed body has a sealing surface coated with a semi-soft material which allows the reeds to form an airtight seal in the closed position. The reed stops bolt above the reeds and restrict their outward movement, preventing them from opening too far and being damaged. The reeds, or petals, open or close without the aid of any mechanical means. They are activated by a change in atmospheric pressure across them. A vacuum in the crankcase opens the valves, pressure in the crankcase re-seats them.

The number of reed petals and the

width of the entire assembly depend on the size of the engine. A small displacement engine may have only four reed petals while a larger engine may have up to eight petals. The valve assembly has to be large enough to allow sufficient fuel and air to flow into the engine.

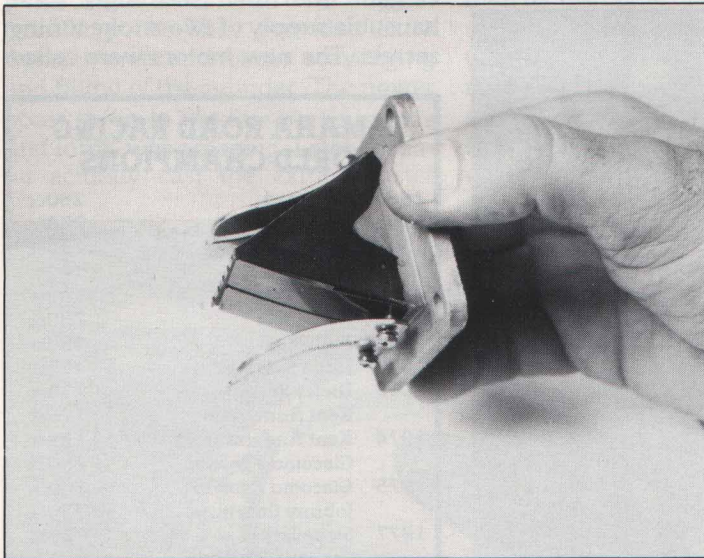
The thickness of the reed will vary between different types of models. A thinner reed is used on a competition machine like the Yamaha YZ Motocross series. This allows the reed to move more quickly in both the opening and closing movements. However, the thinner the blade is, the more prone it is to metal fatigue and must be inspected more frequently.

The YZ engine is usually partially disassembled and serviced after a day of motocross competition. At this time the reed valve assembly is removed and the reeds are inspected for wear or cracks and replaced as necessary. Should a reed petal break off and enter the engine, it may cause severe internal damage. The reed is usually a little thicker in an engine used on trials,

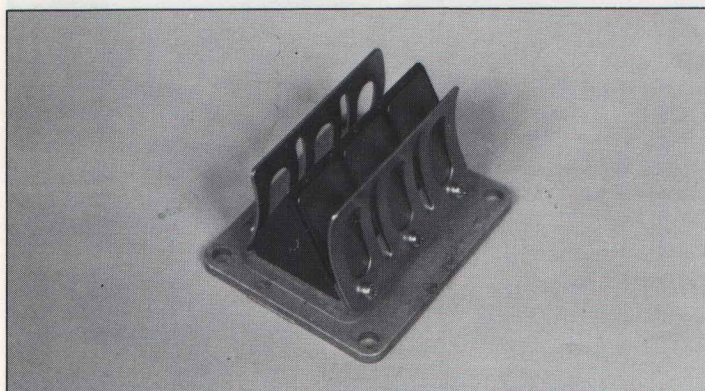
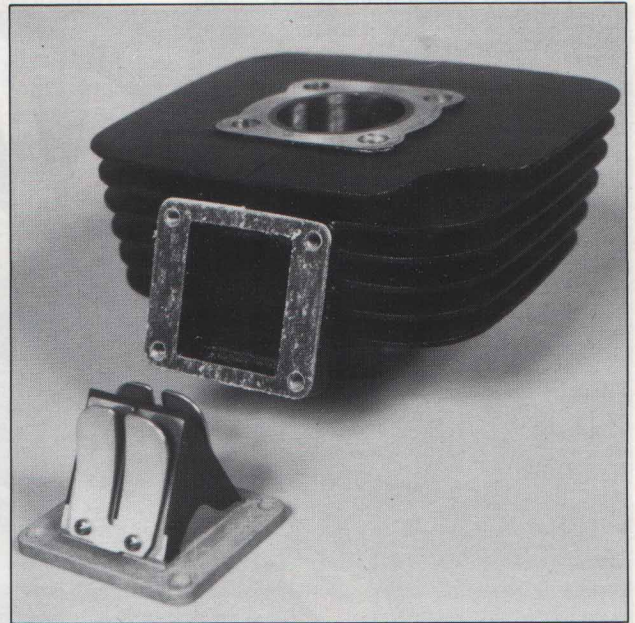
enduro or street bikes. The thicker reed will move slightly slower but is stronger and requires less attention.

The reed valve is designed to increase engine output at different sectors of the engine power band. Low, middle or high rpm and torque are increased by various changes to the components of the valve. The thickness and flexibility of the reed petals can vary. The reed stops can be positioned to allow the reed petals to open more or less. Or the number of petals can be changed. All of these changes can drastically alter the performance of the engine at the desired rpm range. Many hours of laboratory and track testing goes on prior to deciding what configuration of components will be used for maximum engine performance.

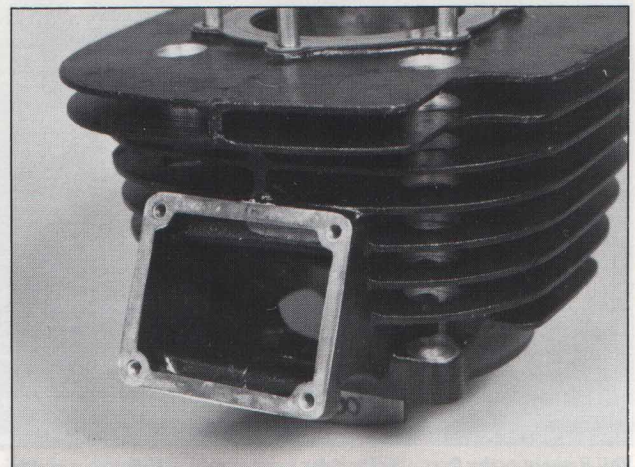
When properly maintained, the reed valve will add greatly to the performance and efficiency of an engine. Other than inspecting it on a regular basis and replacing any worn part, it is a trouble-free and welcome addition to the two-stroke engine.



The reed-valve assembly complete and (right) how it bolts into the cylinder. The assembly slips into the inlet tract and then the carburettor is bolted to the mounting plate.



A high-performance assembly with six reed valves, as used on the Yamaha YZ motocross racers and IT competition enduro bikes. Picture on right shows massive inlet tract which houses this six-reed unit.



WHEN THE "PRODUCTION" RACERS RULED . . .

As road racing moved into the 1970s, Yamaha began the new decade in a vastly different fashion to their glory years of World Championship road racing from 1964 through 1968.

The complicated and incredibly fast vee-fours that had taken control of the 125 and 250cc classes had been outlawed by the Federation International Motocycliste who felt that, with the departure from the scene of Honda and Suzuki, the lower capacity classes were becoming a one-horse race.

From 1969 onwards, Championship racing in the 125 and 250cc category was limited to twin cylinder

125cc and four cylinder 250cc machines with a maximum of six gearbox speeds. Yamaha, therefore, pulled their GP team out of racing.

Gloomy pundits forecast a boring time for lightweight fans but they couldn't have been more wrong. Instead of watching the rest of the pack lag way behind a couple of privileged factory runners, the first half of the '70s brought some of the toughest Championship battles ever seen.

One of the main reasons for this was that the greater percentage of the riders were on equally-matched Yamaha "production" racers that anyone could buy.

And, amazingly to all concerned, it was only a matter of a couple of seasons before the relatively-simple Yamaha production racers were breaking the lap records set by the complex rotary valve vee-fours.

At that time Yamaha's over-the-counter racers carried the TD prefix in the 250cc class and were designated TR for the 350cc category and TA in the 125. They were obviously based on the roadsters of the period. Simple, two-stroke twins with no complicated rotary valves . . . just piston-controlled induction like any other two-stroke on the street.

In making these production racers, however, Yamaha had pulled another gem from their seemingly inexhaustible supply of two-stroke tuning secrets. The new motors were called



Phil Read was the first private rider ever to win a 250cc world title.

YAMAHA ROAD RACING WORLD CHAMPIONS

1964	Phil Read	250cc
1965	Phil Read	250cc
1967	Bill Ivy	125cc
1968	Phil Read	125cc
	Phil Read	250cc
1970	Rod Gould	250cc
1971	Phil Read	250cc
1972	Jarno Saarinen	250cc
1973	Dieter Braun	250cc
	Kent Andersson	125cc
1974	Kent Andersson	125cc
	Giacomo Agostini	350cc
1975	Giacomo Agostini	500cc
	Johnny Cecotto	350cc
1977	Steve Baker	750cc
	George O'Dell and Cliff Holland	Sidocar
	Takazumi Katayama	350cc
	1978	Kenny Roberts
1979	Rolf Biland and Ken Williams	Sidocar
	Johnny Cecotto	750cc
	Kenny Roberts	500cc
1980	Rolf Biland and Kurt Waltisberger	Sidocar
	Patrick Pons	750cc
	Bruno Holzer and Klaus Meirhaus	3-Wheeler
	Kenny Roberts	500cc
1976	Jon Ekerold	350cc
	Jock Taylor and Benga Johansson	Sidocar
	Victor Palomo	750cc

FIM FORMULA 750 PRIZE

(This series preceded the 750cc World Championship. Yamaha winners are listed along with the capacity of machine they used in the series.)

1974	John Dodds	350cc
1975	Jack Findlay	750cc
1976	Victor Palomo	750cc

"five port" engines and the performance difference between them and the "normal" two-stroke was simply incredible.

At that time, the two-stroke was what was termed a "three port" engine . . . induction, transfer and exhaust ports. Actually a misnomer, as there were four ports in total . . . inlet, exhaust and a transfer port on each side of the cylinder.

The so-called "fifth port" was, in

passages through the cylinder walls in the same manner as the original side-positioned transfer ports and gained even more power.

Nowadays, the "five port system" is an integral part of just about every two-stroke on the market. Its benefits were so great that it has become an accepted part of two-stroke technology rather than a "performance option."

Evidence of the performance

US events, which culminated in a factory ride at Daytona for both Kawasaki in the 250cc class and Triumph in the big category. While racing the fast Kawasakis, he had cause to notice that the Yamaha USA team Yamahas were even faster! He obtained a TD1C engine and sent a blueprint of the engine dimensions back to his friend and well-known tuner in the UK, Ron Herring. By the time Rod got back to England in

YAMAHA'S KING OF SPEED

A three-part series on the superstars who brought World Road Racing Championships to Yamaha.

PART ONE: THE NINETEEN-SIXTIES

In the past seventeen racing seasons there have only been three in which Yamaha did not field at least one World Champion . . . 1966, 1969 and 1976. And in one of those years (1976), they had the consolation of taking the FIM Formula 750 Championship prize, a series which was to move to full World Championship status a year later. In that seventeen-season span, seventeen riders and four sidocar passengers have earned a total of 27 World Championship medals with Yamaha. Plus three FIM F750 prizewinner's medals in the three-year existence of that series.

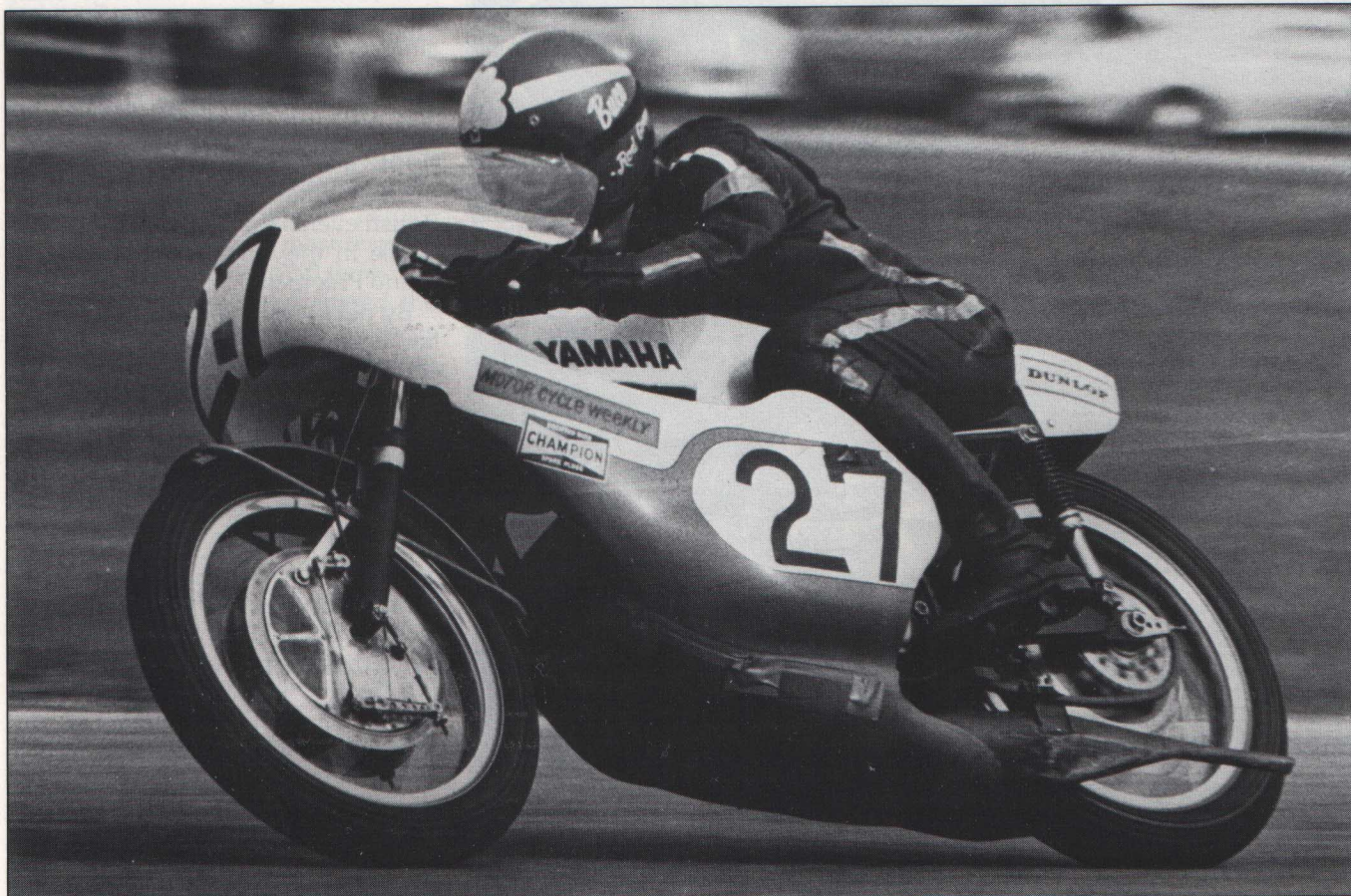
This three-part feature gives "Circuit" readers a look at those Yamaha "kings of speed."

fact, a set of added transfer passages positioned at the back of the cylinder. Originally they were simply grooves in the cylinder liner from the base, up around the inlet tract, to a point on a level with the original transfer ports. They provided extra transfer area and better scavenging and filling of the cylinder. The power boost, even in the five-port system's first form, was amazing. Later Yamaha actually cast the extra transfer

potential of the TD1C Yamaha 250cc production racers had been seen in Europe late in the '60s with one of the most amazing efforts being that of a gritty little red-headed Englishman by the name of Rod Gould.

He spent the winter of 1967-68 in California after establishing himself as a front-runner in both England and Europe with 350cc and 500cc Nortons. While in California he scored several successes in West Coast

March, with the Yamaha engine as part of his baggage, Ron had a Bul-taco chassis ready to house the Yamaha engine. Total cost of the whole bike came to less than 300 pounds and by the end of the 1968 season Rod had taken fourth place in the World 250cc Championship behind the factory V4 Yamahas of Phil Read and Bill Ivy and the factory East German MZ of Heinz Rosner. One incredible ride was at Mallory



Rod Gould was the first rider to take a World Championship with a bike based upon a street machine—the Yamaha TD2 production racer.

WHEN THE "PRODUCTION" RACERS RULED . . .

Park where, for most of the 250cc event, Rod diced side by side and occasionally ahead of Read and Ivy on the factory fours. They finally bested him but there was no more than a couple of bike lengths between the three of them at the chequered flag.

It was Gould who really brought the "production" Yamahas to the notice of the British public when, in 1969, he made another trip to America and purchased a pair of the latest twins . . . the new TD2 250 and TR2 350. With them he gained a second place in the 250cc race at Daytona and led the Daytona 200-mile race until broken exhaust pipes dropped him to fifth.

The bikes were then airfreighted back to the UK and Rod won every 250cc and 350cc race that he contested over the Easter weekend . . . winning every race at Brands Hatch, Mallory Park and Oulton Park by at least half a lap margin!

One of the highlights of his career came later that season when, with the 350cc twin, he beat Giacomo Agostini on the 500cc MV Agusta GP machine at Mallory Park. Up until that point, Agostini had not been beaten by anyone, anywhere, for almost two seasons!

That performance earned Rod the admiration of the British public and they voted him the Motor Cycle News "Man of the Year."

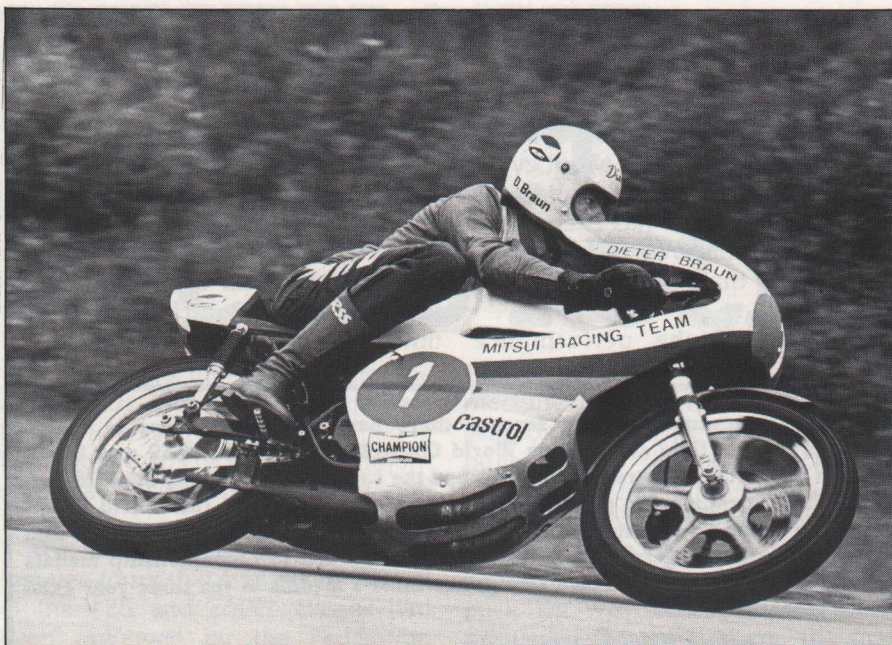
The Yamahas totally dominated British events that season but proved fragile in the long-distance world of Grand Prix racing.

By next season, however, the bugs had been ironed out and Gould reaped his just rewards by taking his Yamaha to the World 250cc Championship, snatching the title away from Kel Carruthers on the last bend of the last lap of the last race of the season!

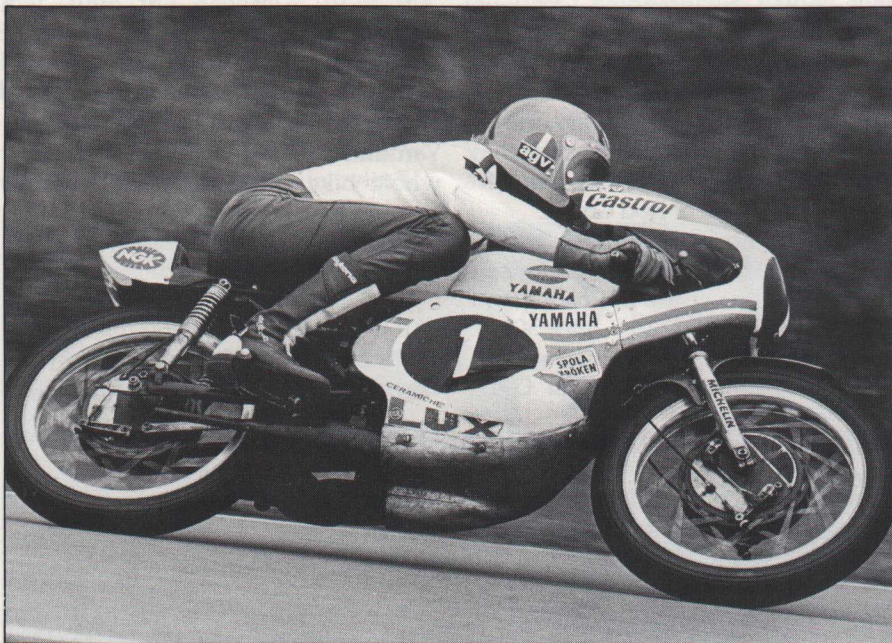
Rod, at this time, was being supported by Yamaha Motor NV, Amsterdam, as a sort of "semi-works" rider along with Sweden's Kent Andersson.

Actually, this support worked against him on occasions as the Amsterdam team was also a development effort and had to keep experimenting with new, and sometimes fragile, parts.

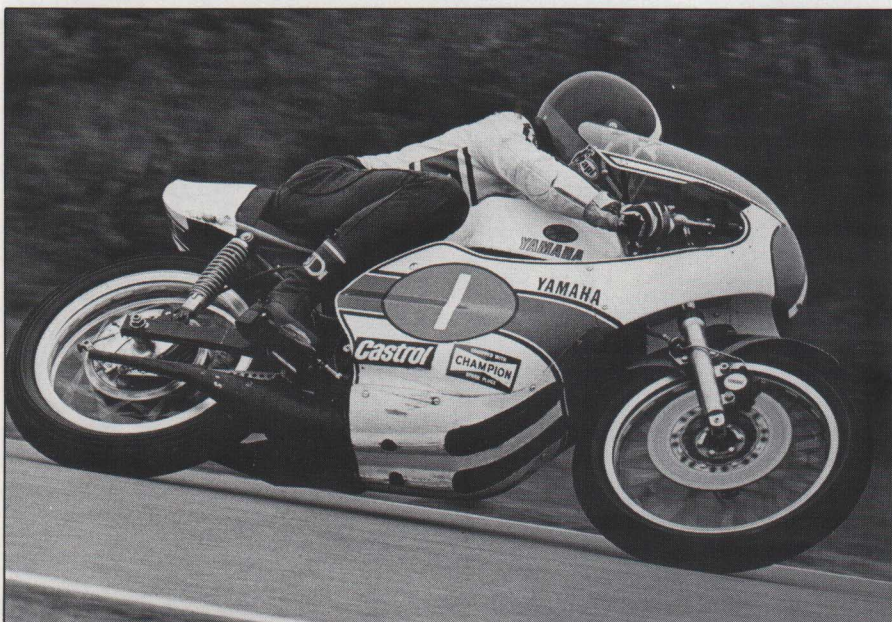
In fact, in 1971 Rod saw the title slip away by a matter of a few points . . . back into the familiar hands of



Dieter Braun was Germany's first World 250cc Champion since the 1950s.



Sweden's Kent Andersson—twice a World Champion.



Giacomo Agostini made much-publicized switch to Yamaha in 1974 and celebrated his move with the 350cc world title.

four-time Champion Phil Read.

Read used a standard TD2 and, with the help of ex-sidecar World Champion and tuning wizard, Helmut Fath, became the first truly "privateer" rider to win the 250cc World title.

By this time the production Yamaha had got a really strong grip on the 250cc class and were even threatening the supremacy of the hitherto-invincible Giacomo Agostini and his MV Agusta in 350cc Grand Prix racing. Doing most of the threatening was a sensationally-fast Finn who was still a relative newcomer to the Grand Prix scene.

In 1971 Jarno Saarinen had shown more than a hint of his exceptional talent and, with some help from the Finnish Yamaha importer, Arwidson, in 1972 he dominated the World 250cc Championship as well as making "Ago" keep one eye over his shoulder in the bigger class. The production Yamahas were by now even creeping into the 500cc class . . . some riders were boring them out to 354cc and scoring big-class Championship points with them. The simple, street machine-based twins were by now the backbone of Grand Prix racing, replacing the British Norton, AJS and Matchless racers as the foremost weapon in the privateer's armoury.

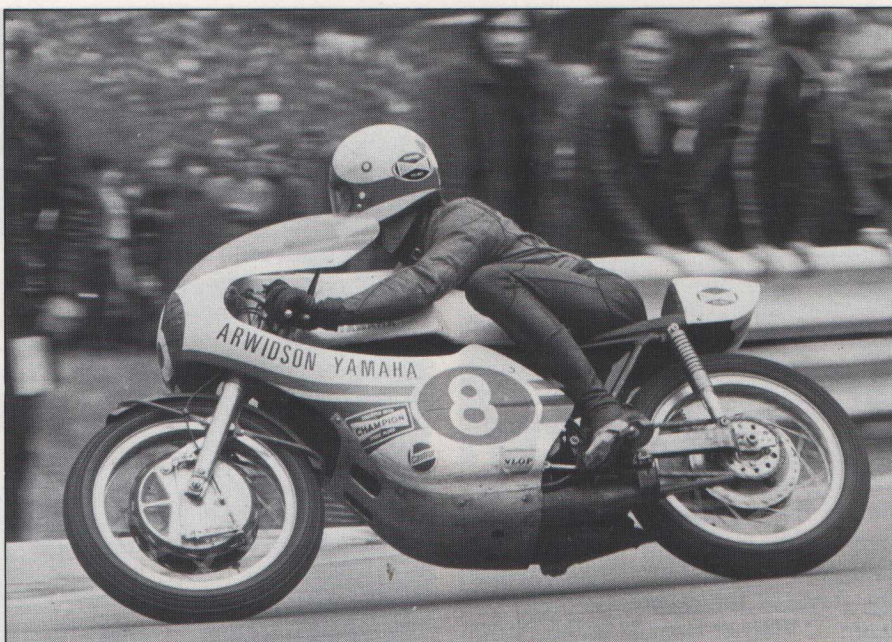
Saarinen's massive talent tragically never got a chance to totally manifest itself.

Nineteen seventy-three looked like being one of the greatest years on the Grand Prix scene for some time. Yamaha was back in with a full factory effort, using an all-new 500cc four. Not a vee-configuration like the old bikes of the '60s but an across-the-frame motor that in most respects was a double-up of the 250 twin.

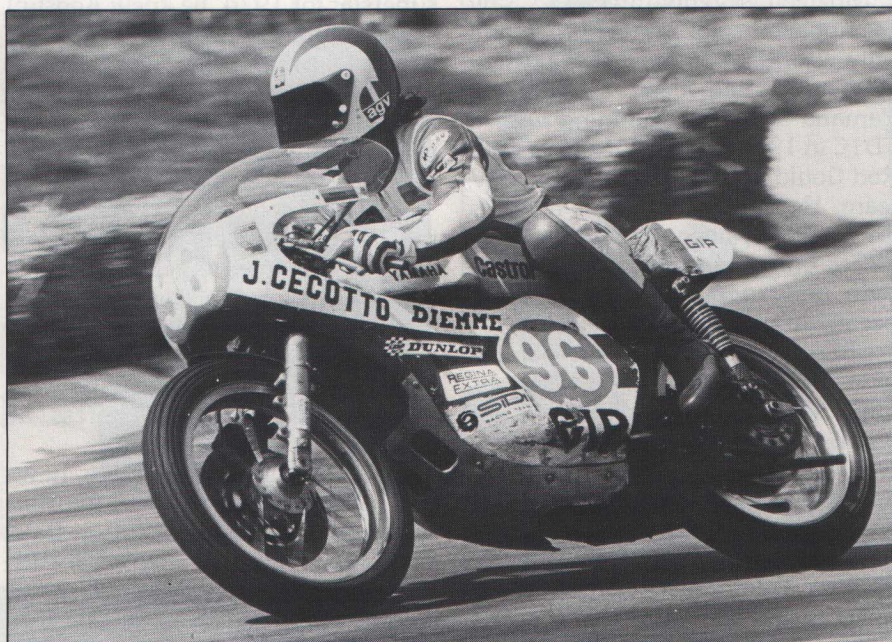
Saarinen and Agostini shared the spoils in the season's opening races but it seemed that the odds were on the Finn to take the title away from Ago's seven-year grip.

Jarno was at the top of his form in 1973, opening the season by beating 750cc opposition on a 350cc Yamaha twin to win the prestigious Daytona 200!

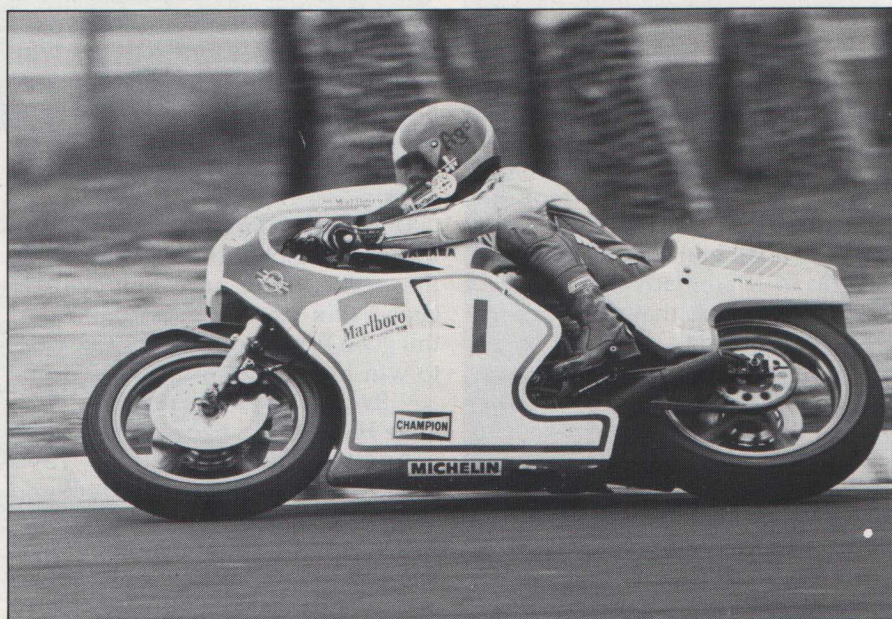
Less than two months later, tragedy struck during the Italian Grand Prix at Monza. A competitor in a previous event had spilled oil on the course and on the first lap of the 250cc race, there was a multiple crash on one of the fastest corners. About a dozen riders went down in the spill and, when the wreckage was cleared, two of the greatest talents in road racing, Jarno Saarinen and Renzo Pasolini, lay dead.



A sensational talent so tragically eliminated—Jarno Saarinen.



Johnny Cecotto absolutely erupted onto the World Championship stage in 1975.



In 1975 Agostini made his 15th and final World Championship in the toughest class of them all . . . the 500cc category.

WHEN THE "PRODUCTION" RACERS RULED . . .

Yamaha immediately sidelined their Grand Prix team until late that season as a mark of respect for Saari-nen and their feeling that there was no other rider really capable of doing justice to the new Yamaha 500.

Two world titles did come Yamaha's way that year. Popular German, Dieter Braun, had won the 125cc Championship in 1970 on an ex-factory Suzuki. Three years later he wore the champion's crown again . . . taking the 250cc title on a Yamaha supported by Yamaha's importer in Germany, Mitsui Maschinen GmbH. He was the first German to hold a World title over 50cc since the days of the all-conquering NSU team of Werner Haas (1953-54) and Helmut Muller in 1955.

Nineteen seventy-three also saw the appearance of Sweden's one and only World Champion so far. Kent Andersson had been a long-time Yamaha stalwart, beginning with a TD1C in 1968 and then teaming with Rod Gould on the Yamaha Motor NV team. He finally reaped his rewards for brand loyalty when he won the 125cc Championship on a neat little twin derived from what originally began life as a 100cc street bike!

The potential of the little parallel twin had been seen as long ago as 1967 when the Yamaha factory team went to the Canadian Grand Prix with their vee-fours and were backed up by a number of Canadian riders on racing versions of the 100cc street machine. The bikes were actually built for a domestic Japanese racing category but the Canadian importer had brought a few into his country for local racers and one or two of them even proved quick enough to get on the leader board.

Five years later, in 1972, the bikes appeared in Europe as full 125cc GP machines ridden by Andersson and Chas Mortimer. Chas won the Isle of Man TT with one and Kent repeated his 1973 World Championship success with another title in 1974.

It was in 1974 that Yamaha pulled a sensational coup that staggered the entire racing world.

Giacomo Agostini had taken over the mantle from Mike Hailwood as leading rider in the world and emphasized his claim with no less than 13 World Championship titles!

The handsome Italian took 500cc World Championships in 1966-67-68-69-70-71 and 1972 as well as 350cc titles in 1968-69-70-71-72 and 1973. But by the end of the 1973 season he was beginning to get

a little disillusioned with the Italian MV Agusta team.

He was under pressure from Yamaha in the 350cc class and for some reason, MV had signed Phil Read to team with Ago in the 500cc category. Agostini couldn't understand why the team needed anything other than a back-up rider for him. Something which a guy like Phil Read would obviously not be content with.

Sure enough, Read actually beat out Agostini for the 500cc title in 1973 and this sparked off a thought in the mind of Rod Gould, who had earlier that year retired from racing and joined Yamaha Motor NV as public relations director.

Rod knew that Yamaha needed a superstar for 1974, he knew Agostini well from their racing days and reasoned that the Italian's pride might well have been slighted by the signing of Phil Read by MV. The time might well be right, thought Rod, for a discreet approach to Ago.

He was absolutely right and during the 1973-74 winter, Rod and Agostini flew to Japan to get the Italian's name inked onto a contract. When the news broke, the motorcycle world went crazy. Italian press and fans were so angry that Ago was publicly pilloried in the press as some kind of national traitor!

Italians being what they are, however, all was forgiven when Agostini appeared on a Yamaha 750 at Daytona and, at his first attempt, totally dominated what was possibly the world's most glamorous race at that time!

It wasn't all a fairy-tale season, however. Though he added world title Number 14 to his tally by winning the 350cc Championship, Ago had to give best to the tough-riding Read in the 500cc class, which was, of course, the title he most wanted to win.

During the next year he made no mistake. Despite the appearance on the scene of a new four-cylinder Grand Prix racer from Suzuki, Agostini got a firm grip on the 500cc class to win his 15th and final world title . . . five more than his nearest rival, Mike Hailwood.

Agostini's 500cc title in 1975 marked the end of an era in World Championship racing. The familiar names of the '60s and early '70s were gradually being replaced by new, young stars like Britain's Barry Sheene and America's Kenny Roberts.

One of these new names came from a country never before associated with top-level motorcycle racing—Venezuela.

At Daytona in 1974 no one really noticed a young South American by the name of Johnny Cecotto, who trailed his 350cc Yamaha twin around in about 50th place, eating the dust of the big 750's.

Next year, they couldn't help but notice him. He qualified third fastest and then suffered the setback of oiling a spark plug on the start line as the race was about to get under way.

He was moved to the back of the 100-man line-up to change the plug and finally got away well behind the field in last place.

Throughout the 200-mile race, Cecotto sliced through the field until, with just a few laps to go, he blasted his private Yamaha TZ700 past the factory bike of Agostini to settle into third place behind Gene Romero and another youngster soon to make his mark on World Championship motorcycling, Steve Baker!

Now the question was . . . what was going to happen on the Grand Prix scene? Would Cecotto prove that a new superstar had risen, or would his effort on the comparatively easy track at Daytona turn out to be just a flash in the pan?

The answer wasn't long in coming. The French Grand Prix opened the season in Europe, just a couple of weeks after Daytona.

Johnny Cecotto won both the 250 and 350 events on privateer Yamahas, handsomely beating the factory 350 of Giacomo Agostini. Then he won the Imola 200 Formula 750 race in Italy and there was no doubting the fact that here was one of the most incredible eruptions of natural talent that the motorcycling world had ever seen.

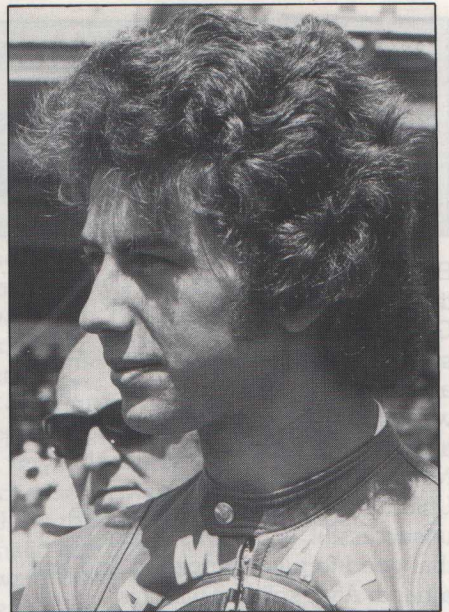
By the end of the 1975 season, Cecotto had taken his production Yamaha 350 twin to a World Championship at his very first attempt.

Road racing's "new wave" was about to kick the old guard unceremoniously out of the door. Hungry young stars with no respect for old reputations were demanding their place in the sun and, for the first time in World Championship history, were prepared to travel across the Atlantic to claim it. □

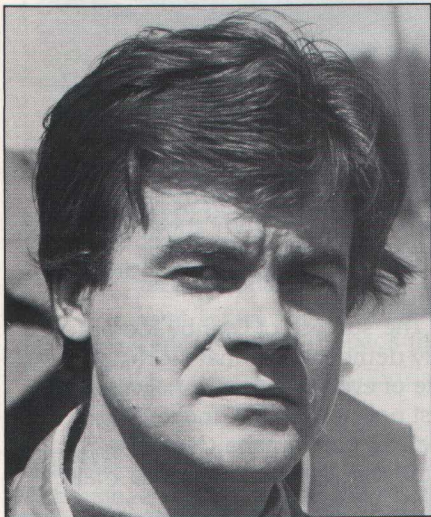
Next Issue: TransAtlantic Invasion. The 1976-1980 World Championships.



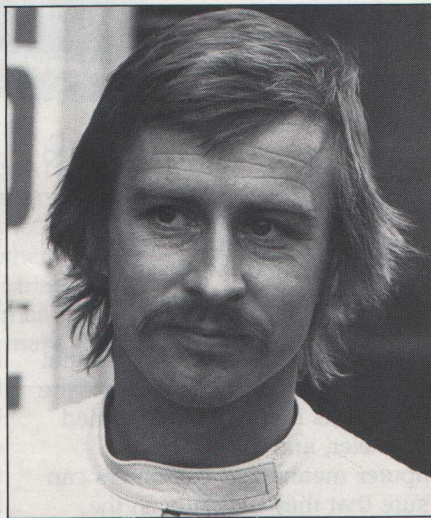
Two of Yamaha's champions—Giacomo Agostini and Rod Gould.



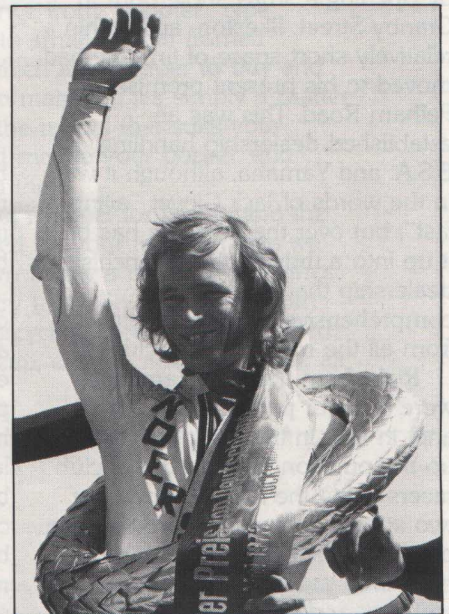
Johnny Cecotto



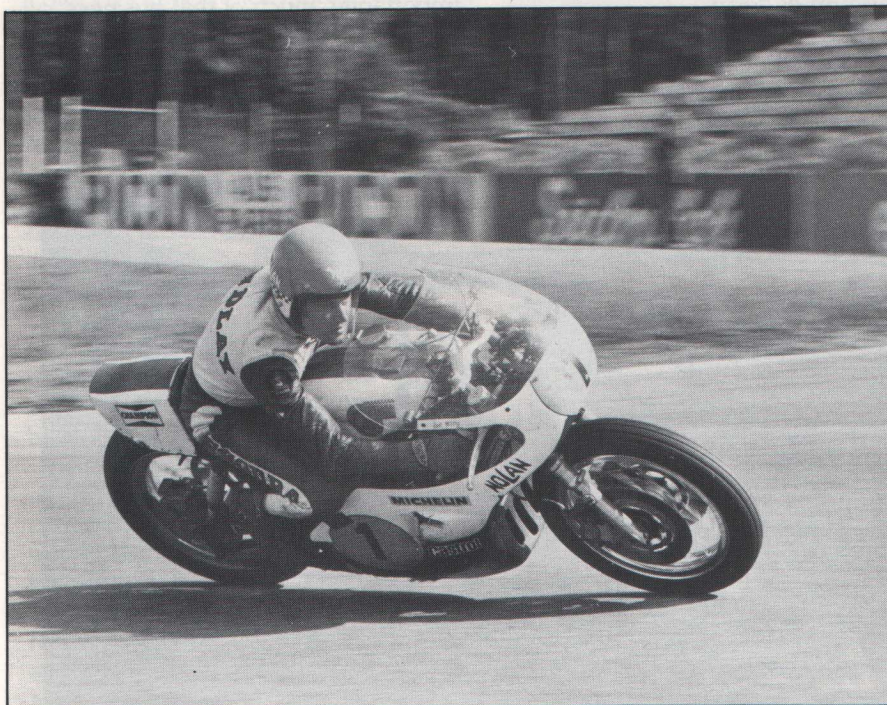
Dieter Braun



Jarno Saarinen



Kent Andersson



Popular veteran, Australian Jack Findlay, set the seal on a solid career in Grand Prix racing by topping the world 750cc standings in 1975 and winning the FIM F750 Prize.



Jack Findlay

DEALER OF THE MONTH

GRANBY MOTORS

Being "in the right place, at the right time" is, according to the owner Jack Glover, the secret of Granby Motors' success. After serving an engineering apprenticeship with Rolls Royce, Jack went into the motorcycle business in a small way, with shops in Nottingham and Ilkeston.

Unfortunately his first venture was unsuccessful, and it was at this point that good fortune stepped in and lent a hand. After splitting with his partner, Jack decided to go it alone by opening a small showroom in Granby Street, Ilkeston, and within a relatively short space of time he had moved to his present premises in Pelham Road. This was an established dealership handling B.S.A. and Yamaha, although it was, in the words of Jack Glover "ailing fast", but over the years he has built it up into a thriving multi-franchise dealership that stocks a comprehensive range of products from all the major manufacturers.

Right from the start Yamahas were a major part of the business and, in fact, in the early days he built up a reputation as a builder of club racers using the AS1 twin-cylinder two stroke. This was before Yamaha produced their own race-kit for these machines, and in the course of stripping and rebuilding these bikes he accumulated a large stock of spares. During the early seventies he also had the same success in club racing with the AS3 model. The accumulation of spares from these projects meant that Jack could supply from stock "hard to get" parts and it was this facility that led to the formation of the Yamaha Owners Club. The club was originally formed as a "spares location service" for Yamaha owners, but it quickly grew into a recognised Owners Club with membership of over two thousand. Unfortunately, due to pressure of business, Jack had to hand over the day-to-day running of the club to T.W. Promotions who have since enlarged the membership.

Because of his involvement with the Owners Club it soon became apparent to Jack that there was a need for a Yamaha specialist in his area, and so three years ago he opened a Yamaha centre in nearby Beeston. The entire range of Yamaha

Stunt rider, Dave Taylor, wheelies through the doorway to open the new Granby Motors Yamaha centre in Beeston.



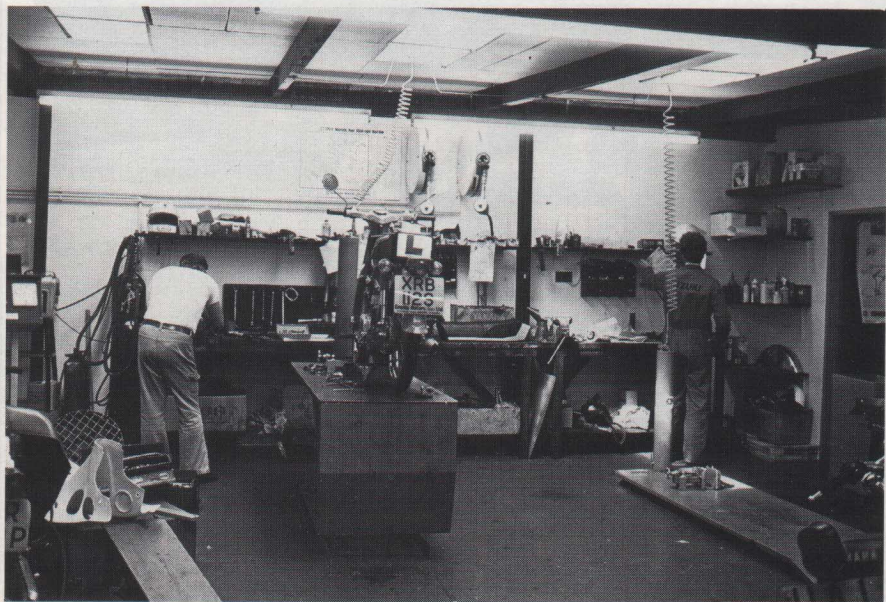
bikes with the exception of road-racers and moto-crossers, are carried in stock and the spares and service back-up could hardly be bettered.

The spares department carries over 60,000 pounds worth of parts and a newly installed computer ensures that stocks are kept at the proper level. Jack Glover believes that his spares department has one of the largest stocks in the country carried by a retailer, and the use of the computer means that customers can be sure that they obtain even the most obscure parts with the minimum of delay.

The workshops are equally well equipped with electronic tuning equipment, air-operated lifting ramps and a rolling road for testing finished machines. All this equipment was

installed at an early stage in the development of the company and Jack Glover believes that its installation has helped to keep Granby Motors at the top of the tree as far as customer relations are concerned.

The success of Granby Motors ably demonstrates that stocking "a little of everything" is not always the best policy to adopt. Indeed, since opening the Yamaha Centre he has found that specialising in one make brings as much business as his multi-franchise premises. More importantly, much of that business consists of repeat purchases due, he feels, to the specialised spares and service back-up that he is now able to offer.



MOPED BUYERS GUIDE

When you mention the word moped, the average person automatically calls to mind a type of machine that bears more resemblance to a bicycle than a modern motorbike. Indeed, in earlier years, before the term "moped" came into use, many of these open-framed, single seat two wheelers were advertised as "Auto-cycles".

Nowadays, however, there are two distinct types of moped, the simple-to-run, easy to ride commuter bike, and the sports moped which is, in reality, a scaled down motorcycle. Choosing between the two obviously depends on the type of usage demanded, but whether you are a down-to-earth, economy minded commuter, or a sixteen year old who fondly imagines that the only thing between him and a world championship is his age, there is a huge range of machines to choose from.

For the sixteen year-olds the choice is relatively easy. For the budding road racer there are beautifully designed sports mopeds whose styles follow closely those of their big brothers in the racing world. If motocross or trials are your scene, then there are small "enduro" type mopeds that make ideal

road bikes that can just as easily take to the trails. If neither of these appeals to you then how about cruising the streets on a transatlantic style U.S. Special complete with high, backswept handlebars, angled tank and a deep, stepped seat.

For the commuter choosing the right type of moped is perhaps slightly harder, as there is very little difference, performance wise, between the various models. All the models are simple to ride with automatic gearboxes and straightforward brake controls, so the final choice is often a matter of personal preference for a particular design. The designs range from "scooter" type machines to small tubular framed mopeds which are cheaper to buy and cost less to maintain. It's simply a matter of finding the model that suits your needs, and maybe your pocket, and going from there.

To make it easier for you to find the ideal moped for your requirements we have shown below a range of machines to suit every taste. So why not start your motorcycling career with a moped, they're cheap, easy to ride and above all FUN.

RD50

Although, according to the letter of the law, the RD50 is undoubtedly a moped, it owes its appearance more to the larger motorcycles in the Yamaha range than to its fellow lightweights. It is, in fact, a scaled down "sports" machine designed to appeal to new riders and young road-race enthusiasts.

The motor is a neat little reed-valve, two-stroke with five speed gearbox that has been proven in previous ultra-lightweights but for 1981 it has been housed in a superb little monoshock chassis. The hydraulically operated monoshock system gives safe, sure roadholding, while equally safe braking is achieved by the use of disc brakes on both front and rear wheels.

Everything about the RD50, from the new style spoked wheels to the expansion chamber style exhaust system was designed with the sports enthusiast in mind. The appearance of the RD50 is further enhanced by the tank, seat and headlamp fairing all derived from its award winning big brothers, the RD250 and 350.



FS1 Special

With a whole range of transatlantic style "U.S. Specials" from 750 down to 250cc currently setting the trend for big bikes it's hardly surprising that Yamaha have given the same treatment to one of their mopeds. Basis of a wild looking 50cc street bike is the rotary-valve four speed FS1E engine, a motor that has started literally thousands of youngsters on a motorcycling career.

The forward inclined engine lends itself well to the "get up and go" US Custom look and the use of the long-established FS1E as the base for the new bike means that the retail price should be very attractive. The FS1 Special retains all the features of the larger models with an angled tank, stepped seat and upswept handlebars all combining to give this new model an entirely unique look. Chrome mudguards and headlamp add a final "custom" touch to a bike that is bound to appeal to youngsters who want a street bike with a difference.



Passola

The Passola must be one of the mildest mannered, easy to ride mopeds on the road today. It has been designed with the woman rider, as well as the daily commuter, in mind and is probably the perfect "round-town" two-wheeler.

Riding the Passola is simplicity itself, just start the engine and open the throttle, everything else is taken care of by the fully automatic transmission. When it's time to stop it's just as easy, simply close the throttle and apply the two hand brakes as you would on a bicycle!

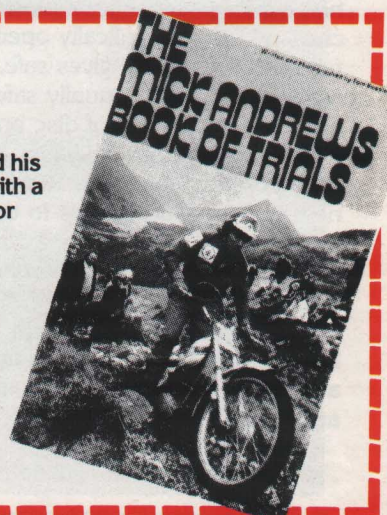
The two-stroke engine is quite capable of returning over a hundred miles per gallon, so the Passola is a very effective and economical alternative to the ever increasing costs of other forms of private and public transport.

"THE MICK ANDREWS BOOK OF TRIALS" on special offer to "CIRCUIT" readers

This year Mick Andrews returned to the Yamaha factory Trials Team and immediately celebrated his comeback with a win in the British round of The World Championship! We celebrate his return with a special offer to fans - your own copy of "The Mick Andrews Book of Trials" - delivered to your door for just £2 including packaging and postage.

"THE MICK ANDREWS BOOK OF TRIALS" is a comprehensive look at off-road trials and enduro riding by one of the greatest all-round dirt riders ever, two-time World Championship winner, Mick Andrews. The book has over 400 photographs in its 224 pages, including superb step-by-step shots of riding techniques. A unique picture section of off-road bikes from 40 years ago to present times is included along with a section on star riders, personal and machine preparation procedures and an in-depth biography on Andrews' long and varied career in international trials, moto-cross and enduro riding. A superb gift for any occasion.

Send £2 cash, cheque or postal order made payable to:
Four Shires Publishing Company, White Lion Chambers, High Street, Banbury, Oxon



QT50

In response to the rising cost of public and private transport Yamaha have produced the QT50, a machine that is cheap to buy, cheap to run, and requires only a minimal amount of maintenance.

Despite its low price the QT still features such refinements as a fully automatic gearbox, automatic choke and a fully enclosed shaft drive that eliminates the need for messy and inconvenient chain adjustment. Suspension, both front and rear, smooth out the bumpiest road and rear view mirrors, turn indicators and a bright headlamp allow the rider to negotiate busy city streets in complete safety.

Beneath the single seat are the oil and petrol tanks, plus a fuel level indicator to show at a glance exactly how much or, perhaps more to the point, how little fuel the miserly 49cc two-stroke motor has consumed.



LC50

Like its close relative the Passola, the recently announced LC50 has been designed for simple maintenance and easy riding. It features easy-to-clean pressed steel wheels, protective leg-shields and large mudguards as well as a rear luggage rack and a front mounting shopping basket.

It is powered by a two speed fully automatic 49cc two stroke engine and uses a shaft drive in place of the more conventional chain drive, thus eliminating regular and messy chain adjustment. The motor also utilises a C.D.I. ignition system designed to give years of trouble-free use.

Simple to ride and cheap to run the LC50 is an economical alternative to rising fuel prices and ever-increasing bus and rail fares.



V50

The V50 is Yamaha's "basic" moped, a well-tryed and well-proven machine ideal for day-to-day commuting, but equally at home on longer journeys. The backbone of the V50 is a pressed steel, welded frame similar in layout to a ladies bicycle. Under this frame is slung the 49cc two-stroke motor and the automatic two-speed gearbox. Over the frame and engine Yamaha have placed sleek bodywork that even includes built-in leg shields to keep the rider as dry as possible.

The petrol and oil tanks are situated under the seat and to eliminate the need for messy, and often inaccurate, pre-mixing of petrol and two-stroke oil the V50 utilises Yamaha's justly famous Autolube system. Suspension is soft enough for comfort but also firm enough to provide good safe handling.



Passola. For the woman who can't stand any more.



Offers liberation for every woman.



YAMAHA Passola. Easy to ride. Light. Slim. Fully automatic—no clutch, no gearchange, no pedals. Over 100mpg. £260 rrp.