

CIRCUIT



SPRING 1982

50p

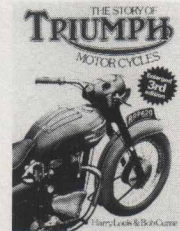
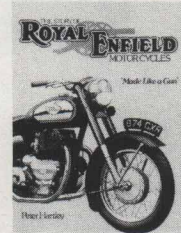
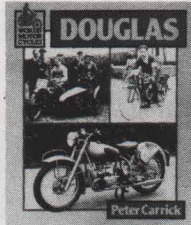
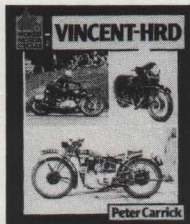
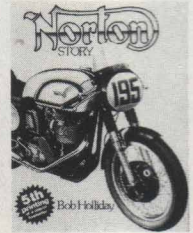
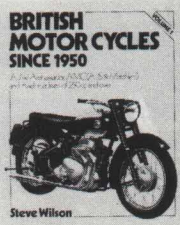


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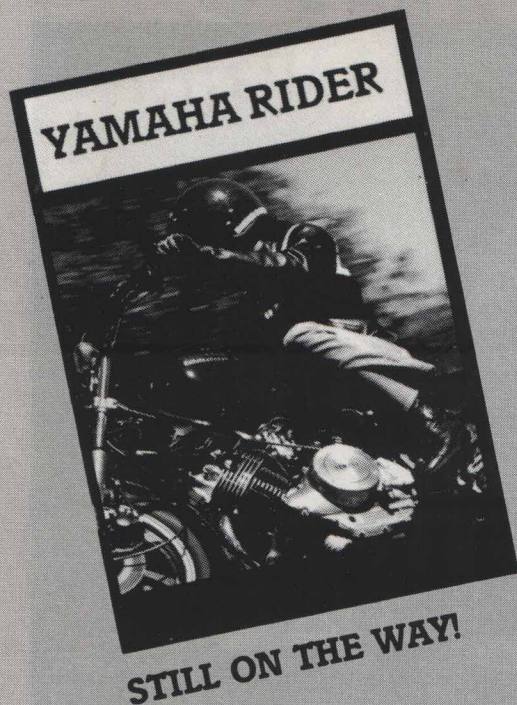
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YC/82



We jumped the gun somewhat on our announcement of our impending title change to 'YAMAHA RIDER'. Finalising details of print schedules, issue frequency and distribution arrangements is taking longer than anticipated so 'Circuit' re-appears once more for this Spring issue!

'YAMAHA RIDER', however, is still on the way, with big changes in editorial format as well as the new title. As the new name suggests, we will be talking more about actually riding Yamahas than simply reporting Yamaha activities. More tests, more touring, more technical tips for Yamaha owners.

This one's for YOU ... the YAMAHA RIDER. Watch for the first issue this summer at your newsagents and check the weekly motorcycle newspapers for details of the new launch date.

GUEST TESTS

Our 'Guest Tests' have proved a popular item, with readers knowing that they are getting an independent, unbiased opinion on the latest Yamaha products.

This issue we have a giant 'Triple Test' section with bikes from street, motocross and enduro categories. 'Cycle' magazine (USA) provided the XJ750 review (it's called the Seca over there) while two other leading US magazines, 'Cycle Guide' and 'Cycle World' brought you the YZ250 and IT250 coverage.

American magazine test procedures are far more in-depth than those of similar magazines here and we are pleased to provide the results for you.

CIRCUIT

SPRING 1982

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The RD 350LC. Fast enough to get you into trouble. Safe enough to keep you out of it.

As anyone who's ridden a new, liquid-cooled 350 will tell you, 'RD' means 'race developed'. Which, in layman's terms, means it goes like the clappers.

Cruising sedately around town, the RD 350 is subdued, law-abiding and respectable enough to charm the stripes off a station sergeant.

Hit the open road, zap up the revs to the 7000 mark ("Motor Cycling" called it 'the warp factor' in their ecstatic report) and suddenly you're in the big league.

Once embedded in the power band, the RD will show a clean pair of wheels to many four-strokes of twice its size.

And, if the law allowed, would cruise happily at 90 mph.

In fact, the bike is already the hero of its own race series. This season, big name riders will be battling it out in 'Pro-Am' events, mounted upon undoctored, straight-from-the-crate machines.

Go on, say it. Your average rider will wind up in serious trouble on an RD 350.

Not so. The liquid cooling system keeps the two-stroke engine supremely safe and reliable.

The double front brake discs are actually bigger than those fitted to many cars.

And the unique Monoshock suspension

keeps the rear tyre in touch with the road, however rough the ride.

So if the RD 350 has effectively opened up our racing stable to the general public, it has also set a new standard in the design of road-going motorcycles.

An exacting standard which, in the true spirit of the machine, had its roots in the split-second discipline of the race track.



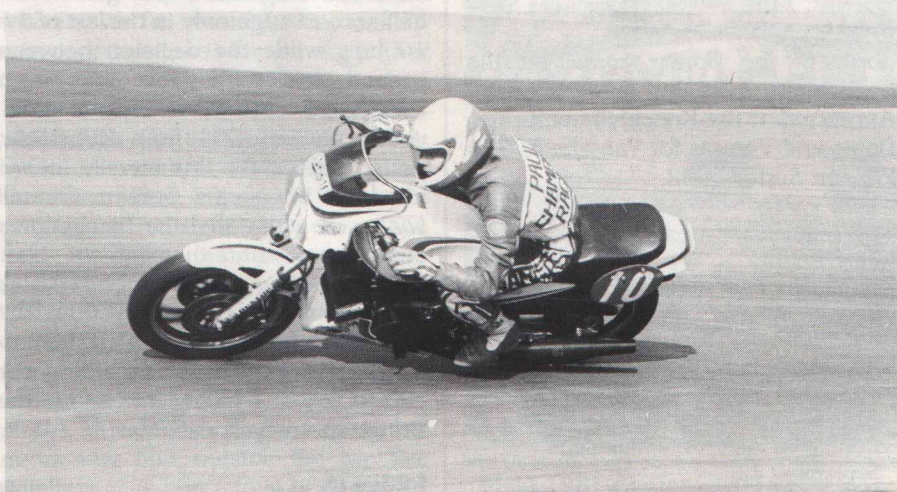
YAMAHA'S PRO-AM SERIES - BREEDING STARS OF THE FUTURE

When it was first introduced into the Yamaha range in 1980 the race-bred RD350LC was seen by many to be a potential race winner. This proved to be true and many riders campaigned the machines in production events at all levels of the sport with immediate success.

The competitions department of the British importers, Mitsui, were also equally quick in spotting the potential of the RD350LC but they came up with a different, and completely new, idea ... and RD350 Pro-Am Series. The basic reasoning behind the series was to produce close exciting racing by using identical machines. The chosen riders would then draw lots for their machine and the end result would therefore reflect rider ability rather than machine superiority.

The first series was such an unprecedented success that Mitsui, in conjunction with Motor Cycle Racing magazine, are once again giving young British riders the chance to show their paces on these incredible production machines. The format of the series remains unaltered but because of their policy of giving young riders a chance in International racing Mitsui have drafted in a whole new team of Amateurs. Virtually all of them are first year International riders who without the help of Mitsui would probably be restricted in the number of international events they could contest. The team of Professionals is made up of the top finishers in last years series with the addition of several new riders who have proved their stature in other forms of road racing.

Mitsui believe that by giving the younger un-established riders a chance in the series they are helping to strengthen the challenge of British racers at the very highest level of the sport, and this belief has already been borne out by fact. Several of last year's top riders will be contesting the new European Championship this season and one will be taking part in the 125cc World Championship Grands Prix.



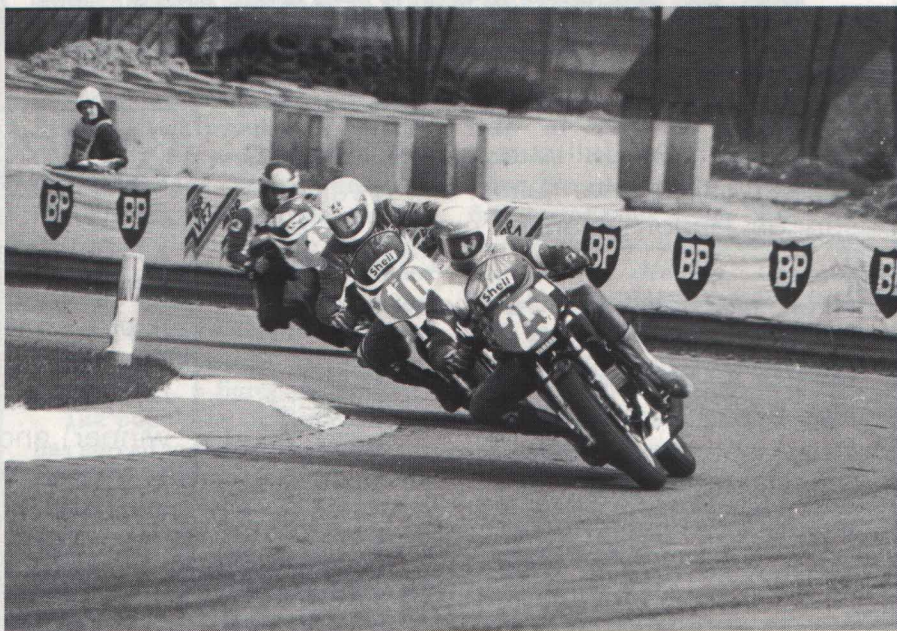
Steve Chambers on his way to winning the opening round of the 1982 Yamaha RD350 Pro-Am Series at Donington.

As more and more of our younger riders get the opportunity to gain experience in top class racing early in their careers our chances of producing another World Champion must increase. This Series gives them just this opportunity and Mitsui are certain that Britain's next World Champion will be a former Pro-Am title holder.

The RD350 Pro-Am series will be taking its unique blend of fast, close and exciting racing to various circuits throughout Britain during the 1982 season. Race fans get the chance to see

the RD's in action at eight top International or National meetings held at six different venues ranging from the flat 'airfield' circuit at Snetterton to the twists and turns of tracks such as Cadwell Park and Brands Hatch. Fans

The leading trio stayed this close throughout the race! In this shot, Ray Swann leads from Steve Chambers and Graham Cannell. The group swapped places right down to the final turn!





Superstar, Barry Sheene, congratulates Steve Chambers, a star in the making.

north of the border again get the opportunity of seeing an RD350 Pro-Am round at the Knockhill track. Dates and Venues for Yamaha RD350 Pro-Am Series 1982.

- April 17/18
Donington Park (International)
- June 19/20
Donington Park (International)
- June 27
Knockhill (National)
- July 24/25
Snetterton (Race of Aces meeting)
- August 28/29
Donington Park (International)
- September 12
Cadwell Park (National)
- September 18/19
Mallory Park (International)
- October 23/24
Brands Hatch (European Final)

The final round of the domestic series is the September 18/19th meeting at Mallory. The Brands Hatch date is a 'European Final' when Britain's top RD350 riders will have the opportunity of testing their ability against riders from similar series in Europe.

HALF-SECOND MARGIN IN PRO-AM SERIES OPENER

Yamaha RD350 Pro-Am Dealer Championship

Just half a second covered the first three finishers after 20 miles of racing at a near-80mph average speed in the opening round of the **Yamaha RD350 Pro-Am Series** at Donington Park, Derbyshire on April 17th!

Winner, Steve Chambers (18) from Cherry Willingham, Lincs, gained his half-second edge only in the last of the 10 laps while the decision between second and third place was even closer!

Ray Swann (21) from Dunstable, Beds, crossed the line literally inches ahead of Manxman, Graham Cannell (22) ... so close that the timekeepers could not separate them!

The leading trio swapped places throughout the race, upholding the reputation that the Yamaha RD350 Pro-Am Series gained for providing the closest, most exciting racing on the British motorcycle calendar.

RESULTS

		Points
1st	Steve Chambers (Am)	15
2nd	Ray Swann (Pro)	12
3rd	Graham Cannell (Am)	10
4th	Simon Beaumont (Pro)	8
5th	Stuart Moorhouse (Am)	6
6th	Phil Usher (Am)	5
7th	Kenny Irons (Am)	4
8th	Rob McElnea (Pro)	3
9th	Ivan Gray (Am)	2
10th	Tom Drury (Pro)	1

Winner's Speed: 79.96mph (record)

Fastest Lap: Ray Swann 81.46mph (record).

Non-scoring finishers: 11 Kim Barker (Pro), 12 Alex Bedford (Pro), 13 Kevin Mitchell (Pro), 14 Niall Mackenzie (Am), 15 Dave Raybon (Pro), 16 Neville Busson (Pro), 17 John Davidson (Am), 18 Mick Capon (Am), 19 Charlie Corner (Am).

Non-finishers: Peter Wild (Pro retired), Duggie Taylor (Pro - crashed), Paul Tinker (Am - crashed).

YAMAHA RD350 PRO-AM DEALER CHAMPIONSHIP

Yamaha dealers in various parts of the British Isles have each sponsored a machine in the Yamaha RD350 Pro-Am Series. For the 1982 season, a Dealer Championship has been instituted with points being earned for the dealer sponsors on the same basis as a rider's individual score. Competing machines are circulated so that one rider never rides the same machine twice. Dealer points, therefore, will be earned by seven different riders throughout the series.

Dealer Championship after Round 1:

	Points
1 Eric Kennard & Co, Seaford	15
2 A.E.Milnes & Son, Leicester	12
3 Chris Vincent Motorcycles, Earl Shilton	10
4 John W.Groombridge, Heathfield	8
5 R.G.Kemp Motorcycles, Northfield	6
6 Sanders & Lewis (Melrose), London	5
7 Bob Thomas Motorcycles, London	4
8 Mason Motorcycles, Haverfordwest	3
9 Buchan Motorcycles, Perth	2
10 Bob Wilding Motorcycles, Merthyr Tydfil	1

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A proven winner by Chippy Moore. Tested and approved by Peter Collins. Only used one race meeting (heat winner) and one test session. - **£750**

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ELBOW-CLASHING ACTION THROUGHOUT 1981 RD350 SERIES

When the unique RD350 Pro-Am Series was first proposed it was envisaged that it would produce fast, close racing, but no-one could have possibly foreseen just how close it was going to be. Right from the first round at Donington Park the series produced drama and excitement with closely bunched riders jockeying for supremacy at virtually every corner. Despite this elbow-clashing action there were thankfully very few injuries and the series rapidly developed into a tussle between three riders, Pete Wild, Kim Barker and Alex Bedford.

The first round was won by Kevin Clementson who was tragically killed the following weekend riding his own machine in another class. Pete Wild eventually finished second just ahead of Bedford but it was a result that was only decided in the final few yards of the race and so it was to continue for the rest of the series.

The second round, held at Cadwell Park went to Gary Padgett, but a spill in the Isle of Man TT put him out of action for some time and left him no chance of the overall championship. The next two rounds found Wild, Barker and Bedford sharing the first three places. At Donington it was Alex Bedford who finished just in front of Kim Barker, but at the following round at Scotland's Knockhill circuit Barker reversed these placings. Pete Wild finished third on both occasions.

Ray Swann took victory at the Snetterton round and Tom Drury at Donington in August. Tom, however, had missed too many rounds after sustaining a broken leg earlier in the season and was not a serious contender for the overall title. By finishing second at Snetterton Barker took over the championship lead from Wild who could only manage fifth place. Alex Bedford was still in contention and two victories at Oulton Park and Mallory lifted him right up the leader board.

The final, double points, round at Brands Hatch saw four riders all with a chance of snatching the Pro-Am title. Kim Barker was holding a slim lead over his season-long rivals Pete Wild and Alex Bedford and Kevin Mitchell still had an outside chance of lifting the series. The cold weather and wet track did not suit Alex Bedford and the championship leader Kim Barker admitted to being extremely nervous

before the race. Pete Wild, however, remained calm and collected knowing he needed to stay only five points ahead of Barker to clinch the title.

As it turned out none of these three riders could get anywhere near the eventual race winner Gary Padgett. He romped away to an early lead and was never seriously challenged. The main interest, as far as the championship was concerned, was happening further down the field. Pete Wild tucked himself comfortably into third place while Alex Bedford hung on grimly back in seventh position. Kim Barker was even less happy, as the race progressed he slid further down the field to finish the race in twelfth position.

Pete Wild's third was therefore enough to give him the overall title, a title he took without ever actually winning a single round. Three second places, three thirds and a season that never saw him outside the top five finishers gave him a total of 96 points, just five more than the unfortunate Kim Barker.

His prize for winning the series was an RD350LC, a somewhat unfortunate award for someone who doesn't hold a full motorcycle licence. Pete later said that he doesn't like riding bikes on the road. In fact when he first tested the RD350 at the beginning of the year it was the first time he'd ridden a road machine for four years!



1981 RD350 Pro-Am Champion, Peter Wild.



Final 1981 Championship Placings

		points
1st	Peter Wild	96
2nd	Kim Barker	81
3rd	Alex Bedford	79
4th	Kevin Mitchell	59
5th	Gary Padgett	56
6th	Simon Beamont	36
7th	Ray Swann	28
8th	Neville Busson	26
9th	Andy Hawkins	24
10th	Simon Buckmaster	22

EUROPEAN PRO-AM FINAL FOR BRANDS HATCH

It was at last year's wet and windy Brands Hatch meeting in October that the 1981 pro-Am series was finally decided. By the time the RD350s reach Brands this year the domestic championship will be finished but this meeting is still not one to miss. Brands has been chosen as the venue for a new and exciting addition to the existing Pro-Am format ... a European Final.

The popularity of RD350 racing has spread to Europe and this year Britain's top five riders will get the chance to put their riding skills to the test against European opposition. Several countries now run their own Pro-Am series using

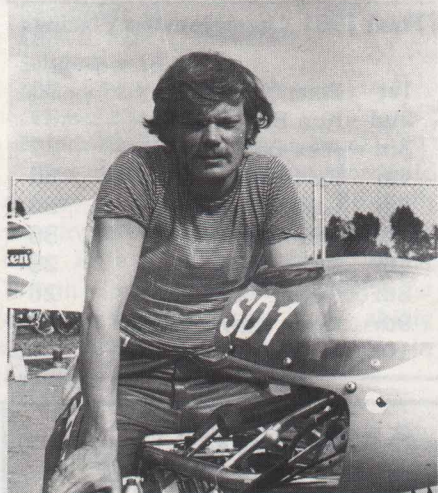
both RD350 and 250s and, with the help of the various European National importers, Mitsui have taken the opportunity to stage the first 'European Pro-Am Final'.

Although the final entry list has yet to be decided, Germany Switzerland, France and Sweden will be sending riders and it is hoped that several more countries will eventually enter. If the domestic series is anything to go by then this truly international event should produce some incredibly tight racing and hopefully see one of Britain's top RD350 riders crowned as 'European Pro-Am Champion'.

STEFAN REISTEN'S XS1100 DRAGSTER— Europe's Quickest Motorcycle

Stefan Reisten, Sweden's top drag racer, has only owned one Yamaha in his racing career. And that bike is the fastest-accelerating two-wheeler in Europe. At the 1981 annual all-bike drag race meeting at Drechten in Northern Holland, he set a new record for the quarter-mile in Europe with a time of 7.74 seconds, crossing the finishing line at 191 mph!

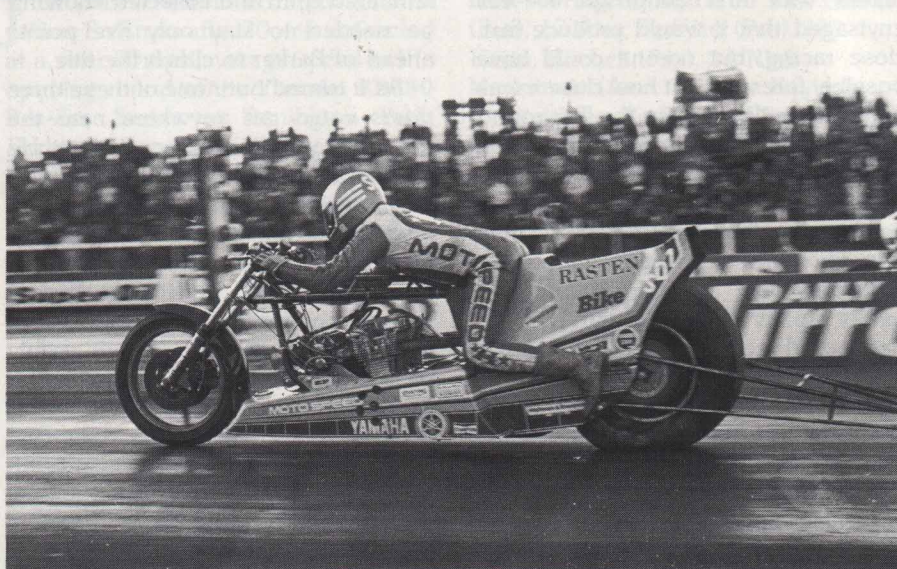
The engine Stefan chose to power this alloy-bodied projectile is an XS1100, that super-strong four-cylinder unit that powers the flagship of Yamaha's fleet of sports bikes. Approached by the Swedish "Bike" Magazine to build an eye-catching bike to be the star feature at a show, Stefan had



only four weeks to complete the machine if he was to earn the sizeable sum they offered him. Taking a month's leave from his job as a carpet fitter in the town of Wastelass, Stefan worked night and day to meet the deadline—and the resulting show machine has been developed in the course of one season to be the quickest drag bike outside America.

Stefan built the frame himself, using a triangulated structure of three top tubes with cross-bracing to give the essential strength at the steering head, when braking from 190 mph tests the bravery of the rider and quality of his handiwork. Twin down tubes bolt to the front of the cradle in which the engine and supercharger sit.

The engine uses the standard crank-



shaft, with cylinders bored to give a capacity of 1147cc, with American-made forged pistons to stand the enormous heat of supercharged nitro-methane burning to produce some 350 bhp. It is mounted back-to-front, to allow an easy flow for the exhaust gases along the straight-through pipes, exiting just behind the seat and giving extra down-thrust as they blast skyward. At these speeds, every chance to keep the bike in touch with the ground is put to best use.

From the right-hand end of the crank a toothed belt drives the front-mounted Magnacharger supercharger—made in Santa Ana, California, by Jerry Magnusson. The supercharger draws the 80 percent nitro-methane fuel blend through Hilborn fuel injection, with a special high speed lean-out valve feeding air to each inlet port as the engine revs near peak. Setting up this lean-out valve precisely is critical to get extra power and help the finishing sprint. Firing the spark plugs is a Scintilla Magneto.

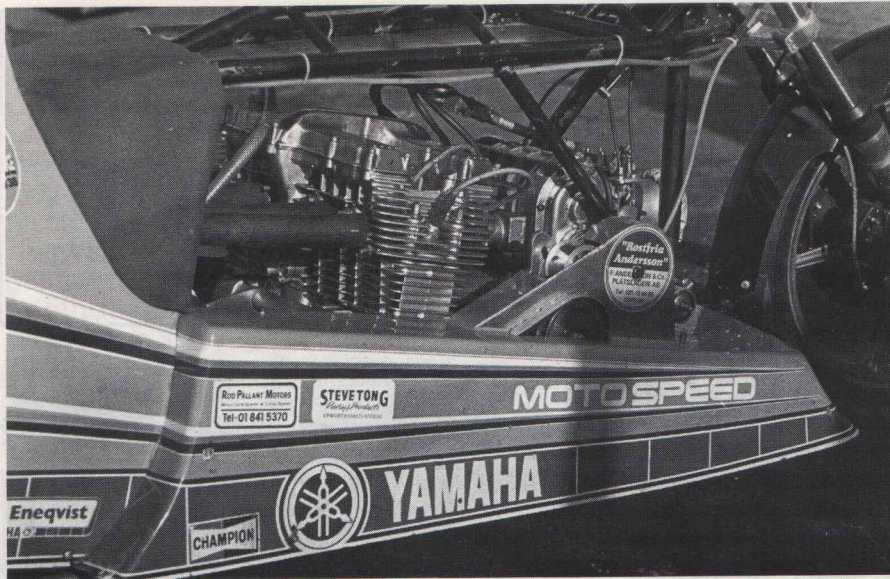
On the left of the bike is an adaptor on the crankshaft that carries a toothed belt pulley. This is for the primary drive to the American-made Crower-glyde automatic clutch, which is a three-inch wide Karata toothed belt. In case you thought belt drive went out with great-grandfather, 1980's technology has brought it bang up to date, and modern materials can be used to transmit 350bhp reliably.

The two-speed transmission is another American import, an epicyclic

unit made by B&J Transmissions and using a direct top gear. This type of unit used to incorporate an overdrive effect for top gear, but by putting the drive direct the power loss is minimized. It amounts to better top speeds.

Gearchanging is by handlebar-mounted button. When a bike is accelerating at a rate greater than gravity's pull, it can be difficult to get your feet back on the footrests in time to make a gearswap—and the revs on these engines climb towards maximum at a pretty quick rate. It takes just a press from the left thumb to trigger the release on the compressed air container that in turn operates the hydraulic gearchange. It's a lot more reliable than the conventional footchange and has saved blown engines on more than one dragstrip.

Taking the drive to the massive rear wheel is a single row chain—surely one of the hardest working components on any drag bike. The 15-inch diameter rear wheel carries a Good-year drag slick, 11½-inches wide and running at pressures from 10psi downwards, according to the grip available on each race track. The drag slick is a very sophisticated tyre, with two-ply walls that are soft and wrinkle under power as the bike leaves the line. The effect is to reduce the overall diameter of the wheel, giving a lower gear ratio and aiding acceleration. As the speed rises, the flexible walls grow under the force of centrifugal gravity and the diameter of the wheel increases—giving a higher top gear and lifting



The engine looks like a stock item, but the Magnusson supercharger and Hilborn fuel injection pump 80% nitro-methane blended with methanol alcohol in to boost the power. The triangulated top section on the frame gives stability under the high stresses of braking from over 190mph.

the top speed. Amongst drag racers, these "crinkle-wall" slicks are known as "the rubber band gear."

One of the most sensational sights in drag racing is the burn out, when the rear wheel spins in a pool of water as the front brake is held. The temperature of the tyre rises to near 100 degrees Centigrade and the cloud of rubber smoke and steam envelopes the bike and rider. Then the brake is released and the bike lunges forward, leaving a streak of molten rubber over the starting line. The bike is pushed back on that footprint of steaming black, to give ultimate grip on take-off.

The left-hand handlebar lever is in fact the rear brake, and the bike is held against the brake as the engine revs rise before the starting light comes on for the race to start. As the green start light flicks on, the brake is released and

the throttle is slammed open. The rear slick bites on hot rubber and tarmac and the bike shoots to 100 mph in less than three seconds, with the blood supply to the rider's brain reducing under the effects of enormous acceleration. As the front wheel lifts, the small wheels on the rear-mounted wheelie bars dig into the track to prevent the bike looping the loop backwards.

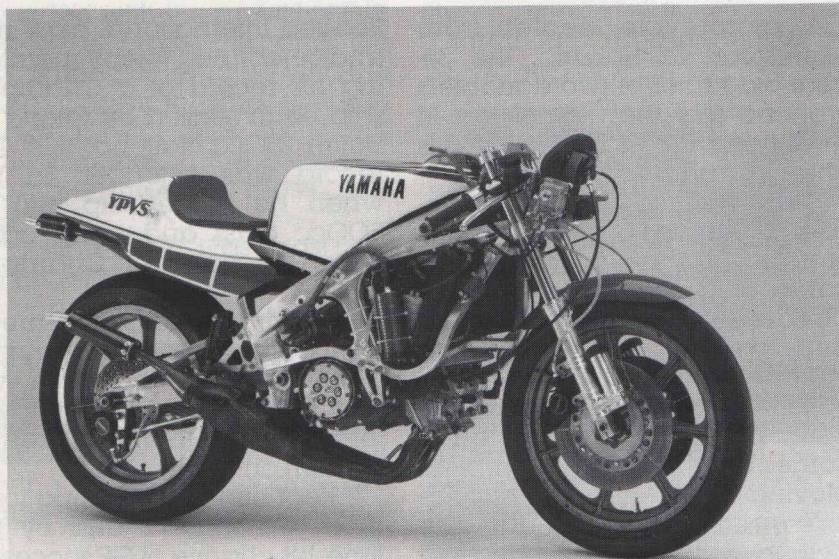
A brush on the button and top gear comes in, with the speed rising towards the 190-plus region. Once across the finishing line, the big problem is stopping the 250kg (550 pounds) projectile. Two discs at the front and one at the rear grip hard and the flexible rear slick bounces as the nose dips. Stopping a drag bike in full flight is the most difficult part of the ride, the tyres squealing as they fight for grip.

Stefan's Yam was built for the quarter-mile race, but he has raced it over 1/8th mile tracks in France as well as quarter-miles in Sweden, Holland and England, where the sound of the nitro-gulping monster has the crowds running to the trackside when the engine roars into life. A quiet man, he has no crowd of mechanics to fettle the bike between races, but gets back to his pit after each run and methodically checks it over ready for the next contest. His workmanship would do credit to the best of works mechanics, every single component checked and double-checked to fit precisely.

He may be only a carpet fitter by trade, but one look at the work put into this bike, from the welding of the frame to the fabrication of the alloy bodywork, reflects his skill as a builder of a motorcycle that has set the standard for European racing.

Sponsored by the Swedish "Bike" Magazine, Quaker State Oils and Yamaha importers Hallman and Eneqvist, Stefan will be in action on drag strips all around Europe in 1982, including a first visit to the popular Long Marston Raceway in England. He should do some damage both to the track record and to spectators' eardrums!

VEE-FOUR IS LATEST YAMAHA GP WEAPON!



PROTOTYPE YZF 500 1982

Latest weapon in the Yamaha Grand Prix armoury is a vee-four 500 for team leader, Kenny Roberts. Britain's Barry Sheene is scheduled to get one of the new bikes later in the year but until then will use the rotary valve square four with which he dominated the Transatlantic Trophy Series.

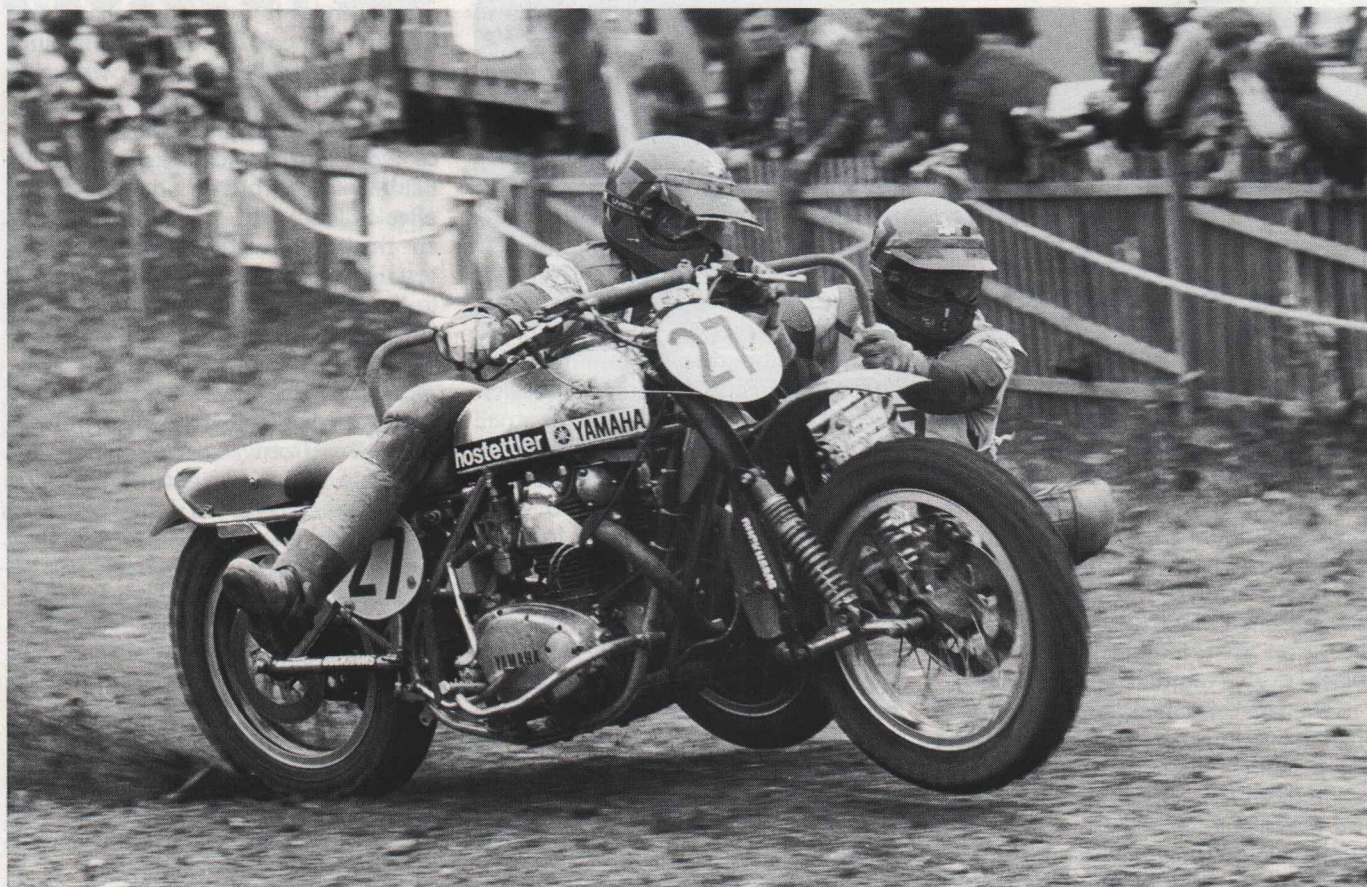
The new vee-four has a 110 degree angle between the cylinders and is water-cooled. Rotary Valve induction and the YPVS power valve exhaust system help deliver in excess of 120hp ... good enough for more than 165mph!

The new monoshock chassis features the engine slung between widely-spaced side members. Rear suspension is by a new monoshock system with the shock mounted across the frame and operated via two bell-cranks.

Eighteen-inch wheels are fitted with the new super-wide tyres and a 16-inch front wheel will also be used at certain tracks.

Total weight of the compact new 500 is under 275lb - comparable with a 250cc production racer!

SIDECAR MOTOCROSS—THE ROLLING THUNDER ROAD SHOW!



Sidecar motocross is the rolling thunder road show of motorcycle racing. The rumble and roar of a field full of big four-strokes, generally unmarred by the ring-ding-ding of a two-stroke engine.

It's a class of racing in which the Yamaha XS650 twin has come to dominate in recent years.

In 1981, the class was awarded World Championship status for the first time and to Yamaha went the honours, thanks to the skill, stamina and speed of Dutchmen Ton van Heugten and passenger Frits Kiggen.

Sweetening the success even further was the fact that another Wasp-chassis Yamaha XS650, in the hands of Terry Good and Jess Rixon, captured the British Championship as well.

Ton van Heugten is one of the great all-rounders in motocross.

The Swiss Bollhader brothers were European Champions in 1980 for Yamaha and would very much like to relieve Holland's Ton van Heugten and Frits Kiggen of their World title this year!

A motorcycle dealer from Amersfoort in Holland, the 36-year-old father of two daughters won no less than 10 of the 14 qualifying Grands Prix in his championship year.

The World title was the culmination of almost 20 years of motocross racing, in which Ton has captured Dutch National, European and World Championships on both two wheels and three.

Back in 1963, a teenage van Heugten won his first title to become Dutch 50cc Champion. Moving on to bigger bikes for the following year, he made the step-up with ease and headed the national 250cc Junior Championship.

As a result he became a fully-

fledged International class rider and celebrated this by maintaining his record of a Championship each season by taking the Dutch 250cc National title. That record was extended in 1966 when he moved up into the 500cc class and, once again, took the National Championship!

By now, Ton seemed assured of a successful career in Grand Prix motocross but the door was slammed in his face midway through 1967, when a broken leg put him on the sidelines.

It kept him out of racing for almost two seasons and by that time, his chance of GP success on two wheels had slipped by. Ton worked himself back into the "top three" rank of Dutch riders

but realised that younger guys had appeared on the Grand Prix scene to diminish his World Championship chances.

In 1971, he made the decision to move into sidecar motocross and found himself back in Junior class racing.

Obviously, that situation wasn't going to last for long. Ton and original passenger Jacques Wery soon hit the international class and by the end of 1972 had taken third place in European Championship standings.

Dick Steenbergen took over the passenger duties in 1974 to begin a four-season partnership highlighted by the European Championship in 1975, plus fourth place finishes in both 1974 and 1976.

Overjoyed at Ton's European Championship success in 1975, the Dutch people voted him their "Sportsman of the Year" and the national motorcycling association, the K.N.M.V., awarded him its top honour, the Hans de Beaufort Cup.

Actually, the years following his European title were frustrating for van Heugten. The Yamaha XS650 twin which he was using had been enlarged to 900cc but the development of this "big-bore" unit was in its infancy and it proved rather fragile during those early seasons. Looking for more horsepower to secure his title, Ton pushed the engine past its limits at that time and suffered many problems during both 1976 and 1977.

In 1978, Ton switched to the Norton twin that was popular and successful at the time. This switch coincided with the arrival of Frits Kiggen as passenger and the new pairing celebrated with the Dutch Championship in both 1979 and 1980, plus sixth and fourth placings in the European Championships for those seasons.

Kiggen, now 27, was a fast sidecar driver himself, prior to joining the van Heugten team. In fact, he was four times Champion of the Dutch amateur federation, the N.M.B.

His successes with Ton, however, decided him to give up driving for the all-important and highly-active passenger's position.

For 1981, Ton aimed everything



Championship crew - Ton van Heugten with (left to right), Frits Kiggen, Ferry Brouwer, Cor den Biggelaar.

at an all-out assault on the Championship. It was to be a World Championship for the first time and the lure of becoming sidecar motocross racing's first World title holder was a potent attraction.

Aided by tuner Cor den Biggelaar (himself a first-class sidecar motocrosser) and team manager Ferry Brouwer, the plans were laid for the campaign.

Yamaha power units had begun to gain the upper hand in European Championship racing once more and the Swiss Bollhader brothers had captured the 1980 title with their big-bore XS650. A lot of special equipment was being made for the motor in Germany and Holland, so Ton decided to go back to the engine that had won him his European title over five years ago.

The switch was a wise move. The new version of the XS650 displaced 1000cc with a fantastic combination of top-end power and torque plus total reliability.

Installed in a Wasp chassis, the XS650 ran like an express train

for the whole season.

Only setback of the year was when Kiggen was seriously injured in a British GP crash. While recovering, his place was taken by Sies Hurkmans and van Heugten's momentum was barely slowed. He and Hurkmans were able to win a Grand Prix, in fact, and kept Ton well in contention for the title.

Appropriately, Frits returned to the chair for the Swiss GP at Wohlen ... and it was there that he and van Heugten, with the help of the big Yamaha, clinched sidecar motocross racing's first World Championship.

To emphasise their superiority, the duo were also top scorers in the final Grand Prix of the year, taking first in one moto in Denmark and second in the other.

For Ton van Heugten, the return to Yamaha power had paid off.

Six years after the XS650 twin had brought him the European title, the Yamaha four-stroke had helped Ton become the first-ever World Sidecar Motocross Champion.



Van Heugten (right) with Dick Steenbergen was also European Champion in 1975.

POWER ON DEMAND!

The Yamaha power unit which took Ton van Heugten and Frits Keggen to the first-ever World Sidecar Championship probably has more torque than any other engine in racing today.

Even more than outright horsepower, sidecar motocross demands instant pulling ability from the lowest rpm.

That's what van Heugten's motor is built to deliver . . . power on demand!

Engine-builder Cor den Biggelaar was a top sidecar motocross racer in his own right, so he knew exactly what he wanted when the project began.

He started with the basic Yamaha XS650 power unit and replaced the standard cylinder head with his own "secret weapon" . . . one of the specially-cast heads made by Yamaha for Kenny Roberts' last attempt at the American National Championship on the dirt ovals.

Into the standard crankcases went a special Hoeckle crank made in Germany with the stroke lengthened from 74mm to 88mm. Standard 80mm barrels were bored out, resleeved and fitted with specially-machined 85mm pistons.

Neither barrels nor crankcases were strengthened . . . testimony to the strength of the standard components.

What was toughened up, however, was the gearbox, which had to cope with the demands of the immense torque plus the added strain of hauling around the sidecar outfit with both rider and passenger.

First gear was removed and the other gears widened. Particular attention was paid to strengthening third gear, as an outfit spends much of its time in that cog.

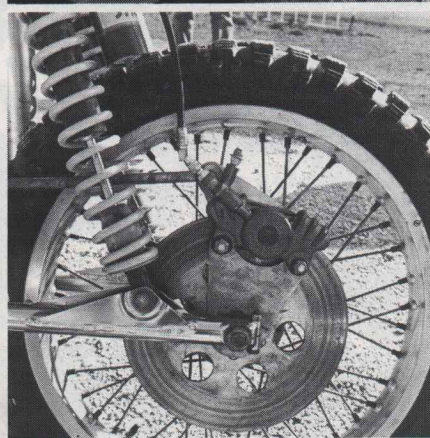
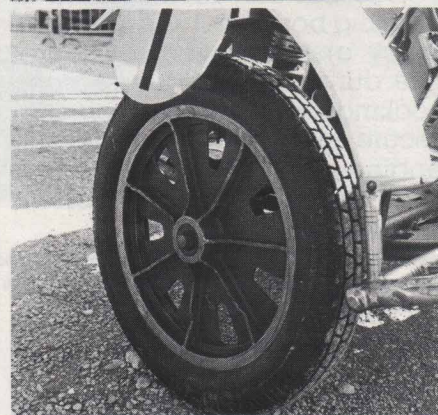
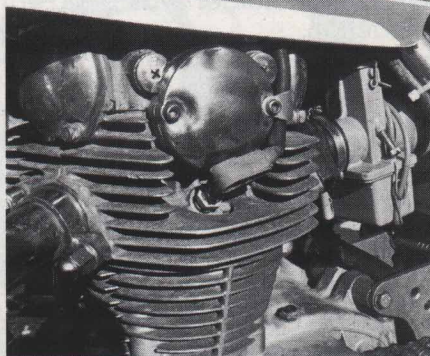
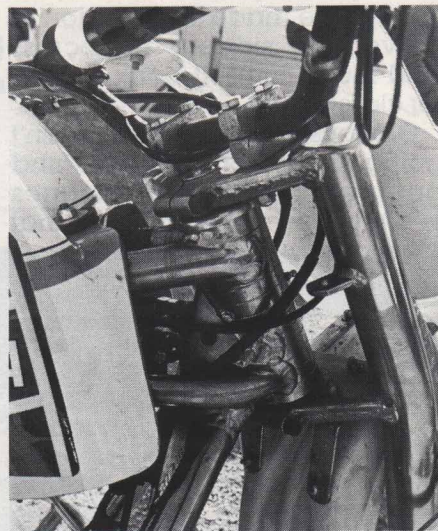
Final modification to the transmission was a wider drive chain, from 530 to 630 width.

The special OW72 cylinder head bears no relationship to the standard part. It has higher inlet ports with steeper valve angles, 12mm central plugs and redesigned rocker arms and camshaft. It is a completely different casting from the standard XS650 and cannot be duplicated.

When fitted to the U.S. dirt-trackers, it was producing over 85bhp from 750cc, at almost 9,000rpm.

In sidecar form, the engine displaces 1000cc and, with the aid of the special head, produces between 80 and 90hp, depending on camshaft timing. It punches out this power, however, at just 6,500 rpm with incredible torque on tap from 3,000 rpm.

The power unit is installed in a British Wasp chassis, now established as one of the outfits to beat in Championship sidecar motocross.



The XJ 550. Little brother or big mother?



Don't turn your nose up at the c.c., the XJ 550 will leave a lot of bigger 4-strokes standing.

Oh yeah? Yeah.

Because it's the only Yamaha machine in the U.K. fitted with the Yamaha Induction Control System.

A simple, yet ingenious device which ensures that not one iota of power is wasted (unbelievably, it reduces fuel consumption by approximately 10% at the same time).

What's more, a traditional chain drive puts every ounce of that precious power to use.

Just like its big brother the XJ 650, the XJ 550 is a true thoroughbred. Its

remarkable narrowness and lightness combined with a double cradle frame for perfect balance make it an absolute doddle to handle.

Other features include 6 gears, transistor controlled ignition, adjustable rear suspension, teflon-lined front forks, an excellent braking system, sporty Italic wheels and believe it or not, even a fuel gauge.

So, if you're going to pick on a little brother, we don't think you could make a better choice.



YAMAHA XJ750RH SECA

Yamaha stuns the 750 class with a shaft-driven sports bike that has it all: high performance, new technology and a great blaze of flash.

● THOREAU'S INSIGHT ABOUT MEN HEARING a different drum seems valid to many people. To modern-day motorcycle manufacturers the concept has almost changed into an imperative dictum. Over the past 15 years the Japanese Big Four have created a fiercely competitive buyer's market. They are now too sophisticated to aim new models squarely at another manufacturer's product in the hope of knocking it from the sales charts; butting head-on in the sales arena like corporate billy goats generates headaches, not sales. Motorcycle manufacturers now try to shape their bikes subtly to fit specific niches within each displacement class.

The highly competitive 750cc class currently epitomizes this process. Suzuki, Kawasaki and Honda all offer excellent 45-inchers, each satisfying a slightly different need within the range of sport to sport-touring motorcycles. To crack such a tight market, Yamaha had to develop a 750 that was not only good, but also highly tailored; a bike that offered a little more of the same old thing might be largely ignored in the marketplace despite excellent performance.

Yamaha need not worry about anyone ignoring the XJ750RH or claiming it's run-of-the-mill; it's a bonafide sports bike with styling and functional innovations enough to stand out in the most stellar of motorcycle crowds.

The Seca's anti-dive suspension system can rightfully be called the most innovative feature on the 750. Although various forms of anti-dive arrangements have appeared on racing machines (See March 1981 *Cycle*), the Seca's is the first brake-controlled front fork compression damping system for street use on a production motorcycle.

An anti-dive system is desirable because a telescopic fork—for a couple of reasons—tends to bottom under braking loads. A bottomed suspension reduces ground clearance and transfers the force generated by the wheel hitting bumps directly to the chassis and rider. Traditionally, stiff springing—either air, coil springs or both—has compensated for this bottoming tendency. This method,





YAMAHA 750 SECA

however, is only a compromise; overly stiff springing sacrifices suspension compliance and therefore ride compliance. Also, conventionally designed dampers make the front end "pump down" over a series of bumps, which increases the tendency to bottom. "Pumping down" occurs because forks ordinarily have as much as five times more rebound damping than compression damping. When a bike is braking, the normal rebound bias of the dampers combines with the other forces compressing the fork and helps prohibit the springs from extending.

Yamaha's anti-dive suspension system prevents the front end from pumping down by increasing the fork's com-

pression damping (counteracting the rebound bias) when the front brake is applied. Hydraulic pressure in the front brake system activates a small spring-loaded valve that closes most of the compression damping oil circuit, thereby restricting flow and substantially increasing compression damping. This increase is designed to keep the front end from diving suddenly under braking. However, should the tire hit a sharp bump or hole during braking, the Seca's fork can still respond with "normal" damping characteristics thanks to a check-valve.

The anti-dive valve rests against a spring-loaded seat that opens when compression forces become high enough. Fork oil flows through the normal damping circuit when the seat has

opened, but as the bump smooths out, the seat closes and the fork once again continues to operate with the anti-dive valving restriction. If you wanted a normal fork to have this anti-dive capability, you'd have to design in entirely too much compression damping, which would make it too stiff. But Yamaha's anti-dive system doesn't impair overall ride quality because compression damping is increased only during braking. In fact, since the fork spring rates no longer have to be a compromise to resist braking loads, they can be softened to deal with road conditions only, and therefore comfort can be increased.

In actual practice, the Seca's anti-dive suspension system works quite well. The huge difference between

The Yamaha XJ750 has been sold in the USA for the past year or more and is now available in the UK.

The sporting, lightweight four utilises a larger version of the XJ650 engine with shaft drive, plus anti-dive front forks and the Yamaha Induction Control System.

Performance of the XJ750 is HOT! Recently, Yamaha USA employed pro drag racer "Pee Wee" Gleason to show just how hot. In a run scrutinised by motorcycle association officials and press, Gleason took the XJ750 through the standing quarter in 11.99 seconds . . . faster than any other 750, shaft or line drive, and the first time that a 750 production bike has broken out of the 12-second bracket.

compression damping with the brake on and off feels unusable as you bounce up and down on the stationary bike. On the road, however, the anti-dive effect is much less pronounced. Many riders may not be able to discern any difference in fork action under heavy straight-line braking conditions; it's not necessarily a starting difference in those conditions because the relief valves open when hard braking generates enough pressure. The anti-dive effect is most noticeable and useful when you brake while turning and over ripply, bumpy ground; the fork compresses and the bike settles down gradually, so you worry less about losing ground clearance, and it's easier to make steering corrections if necessary. There's also plenty of travel avail-

able—a blessing in rough corners.

The amount of anti-dive effect is variable with Yamaha's particular system; the bottom of each bolted-on anti-dive unit features an indexed adjuster protected by a rubber cap. The adjuster bolt varies the amount of spring preload on the anti-dive valve piston to change the amount of anti-dive resistance. The entire range of adjustment is useful; settings vary according to the riding conditions. The number four position (one step from maximum) works well for hard back-road riding, one or two works better for less demanding one- or two-up cruising, and position five suits a fully loaded and faired bike. The anti-dive system adds little weight to the fork, and its benefits more than offset any pen-

alty in unsprung weight.

The Seca's suspension components are adjustable in other ways as well. Each fork leg is pressurized with air through a collar mounted below the top clamp, which takes the place of the more common air caps. The air fittings are not joined; you must check and adjust each leg separately. But since the air valves are easily accessible, it's a less burdensome chore than it might be. The recommended standard setting of 5.7 psi works well for cruising, and 16 psi helps your stability when hard charging. The recommended maximum of 36 psi is useless for

Continued over



YAMAHA 750 SECA

all but masochists. The stiction level is low in the fork, and damping action is good with the stock 20-weight fork oil.

The XJ750 uses a two-shock rear suspension system. A four-position adjusting dial resides at the top of the shock; position one yields the lowest damping rate, number four the highest. Each step is spaced well enough to produce useful changes, and the entire range is wide enough to satisfy most riders under most conditions. Yamaha considers number one the standard setting; *Cycle's* testers used that setting for freeway cruising. For canyon riding we used positions three and four, depending on rider weight and aggressiveness. Spring preload adjusts to one of five settings with the standard ramp-collar arrangement. The collar, with only one lug for adjusting, is awkward to use at times, and the upswept exhaust pipes sometimes get in the way.

Overall, the suspension components give the Seca a sporty, taut feel. Slighter testers (140 pounds) thought the XJ's ride bordered on being harsh even with everything dialed down to "full soft." And although all testers agree that the Seca doesn't set any new records for touring comfort, all think the sacrifice is worthwhile because the Seca works so well on mountain roads.

The Seca isn't just a good-handling shaft bike; that backhanded compliment often implies that sport-oriented drive-shaft motorcycles are inherently inferior to chain-driven sport types. On the XJ, Yamaha has successfully controlled the pronounced up-and-down torque reaction that plagues so many shaft-driven bikes. The Seca's rear end never bobs annoyingly, and changes in throttle openings usually produce no noticeable torque reaction at all. The most notable feedback occurs during full-throttle shifts; a kick through the seat reminds you that you are indeed riding a shaftie. Overall, though, there are no bothersome shaft-drive effects.

The Yamaha feels compact and light for a 750, and the numbers support these impressions. The XJ has a 56.9-inch wheelbase, 28 degrees of rake and 4.49 inches of trail, figures that suggest quicker handling than those for the Honda and Suzuki 750s, yet not as quick as the catlike Kawasaki KZ750. Tipping the scales at 521.5 pounds fully gassed, the Yamaha weighs in at the same relative position; it's 20 to 30 pounds lighter than the Honda and Suzuki and 25 pounds heavier than the KZ. In actual use, the Seca steers precisely and lightly without being too quick; the bike never gets twitchy, even at 100-mph-plus speeds.

Lack of ground clearance with the Seca can disconcert hard-core go-fasters. With many bikes, riders can use the footpegs as lean indicators in corners and drag them along harmlessly like out-

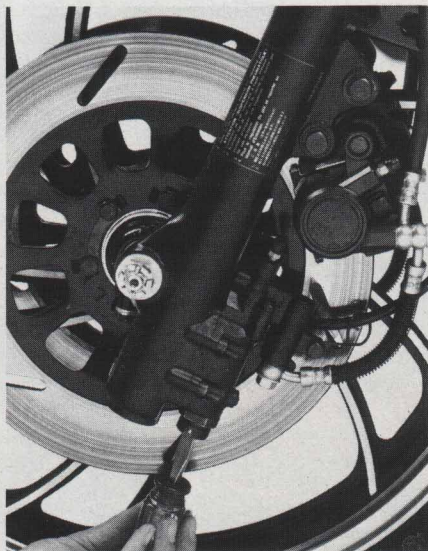
riggers. Not so the Seca. Yamaha carefully tucked the short, beveled pegs in close to the bike, and their warning is real: solid objects touch ground immediately after the pegs hit—the sidestand drags on the left side; the brake pedal, centerstand, pipe-junction shield and head pipe grind on the right. During one photo session, enough pieces dragged in a fast, right-hand sweeper to unload the rear end momentarily, sending the bike into a slide. The Seca never tried to high-side the rider and it reacted and steered predictably, but that's not the type of thing you want to practice regularly.

For hard-charging riders the extremely short pegs also increase boot-scraping in corners. We realize that many riders like to drag the outboard side of their shoes to gauge lean angle and that the café crowd proudly displays beveled boots as a badge of courage; the Seca, however, forces its rider to move his feet back on the peg or turn them sideways and move them in.

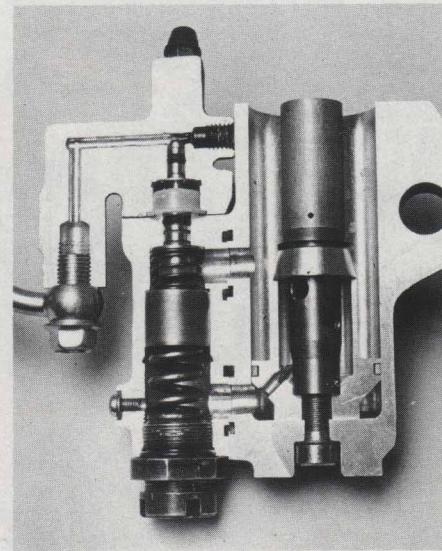
The Seca's limited ground clearance (indeed, 99th-percentile riders call it a problem) is in part due to the low seat

height. The seat is only 30.8 inches off the ground, which makes it easy to walk the Seca around or support it at a stop. More than an inch lower than the two larger '750s', the Seca's seat gives up more than an inch of ground clearance in comparison. All other factors being equal, a bike with a longer wheelbase needs more ground clearance because it must be heeled over farther at a given speed through a corner; so the difference can be rationalized in part. However, Yamaha engineers have sought a low seat height at the sake of some ground clearance compared also to Kawasaki's KZ750: the Seca has a half-inch-lower seat, a half-inch less ground clearance—and a one-inch-longer wheelbase.

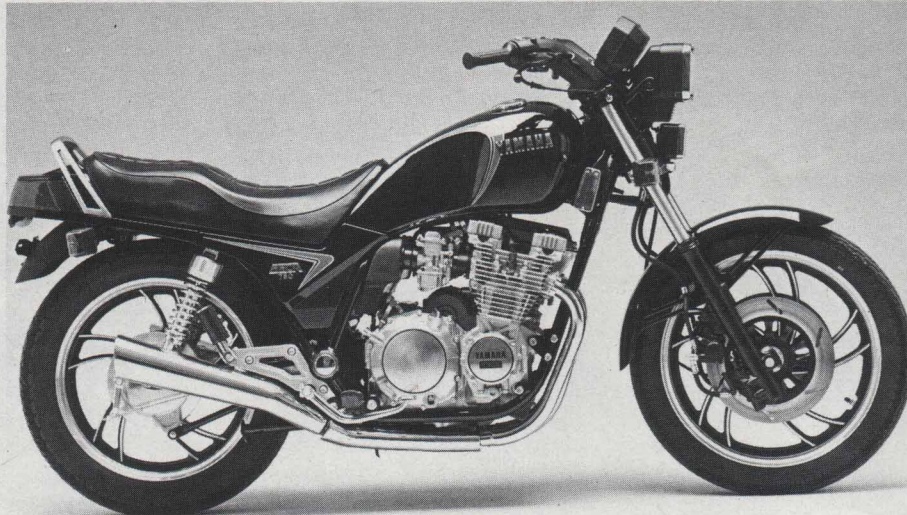
The Seca's brakes, though good, are not excellent. Although the front dual discs provide plenty of stopping power, actuation feels spongy and vague, which makes it difficult to modulate near the lock-up point. In an effort to clean up the handlebar's appearance, Yamaha designers moved the front brake cylinder to a point between the fork legs and behind the headlight shell. A heavy-gauge wire



Yamaha's anti-dive unit adds little unsprung weight and features a check-valve system that is adjustable.



The front brake actuates a valve which then rests against a spring-loaded seat, thereby restricting oil flow.



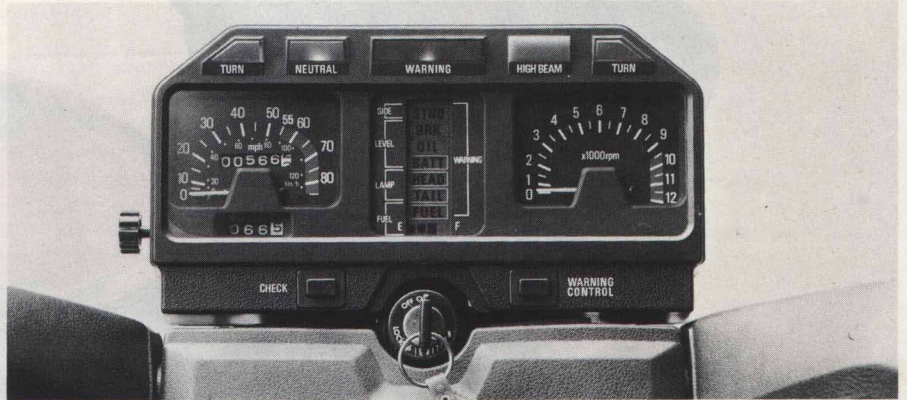
INSIDE THE 750

cable connects the lever and cylinder, and we suspect this is where the feel is lost. One advantage to the cable system is that the rider can adjust the front brake at the lever, something that can't be done with most front disc brake systems. However, we'd gladly trade a cluttered bar and a lever that's not adjustable for precise brake feel. The rear brake is a single-leading-shoe drum; its stopping power is adequate, but the brake is subject to fade, and it too lacks truly precise feel.

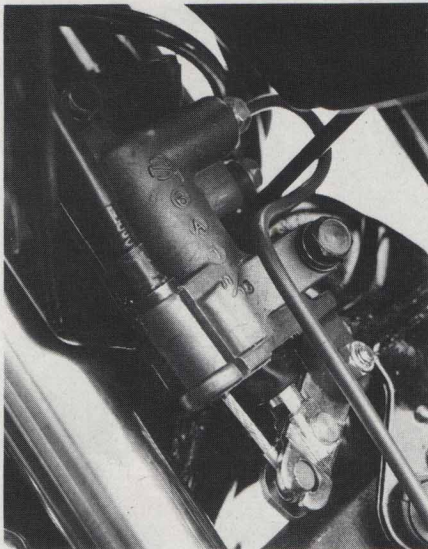
Yamaha had already introduced two totally new engines in their 650 Maxim and 550 Seca, so we were not surprised to see a familiar-looking engine in the big Seca. Yamaha derived the 750's engine from the Maxim 650 unit, and we like that because we consider the engine the best part of the Maxim. Using one basic powerplant for more than one displacement makes a lot of sense; design, development and production costs can be amortized over several models, thereby realizing a savings that can be passed on to the consumer.

The Seca's cases, clutch and power train are identical to the Maxim's, includ-

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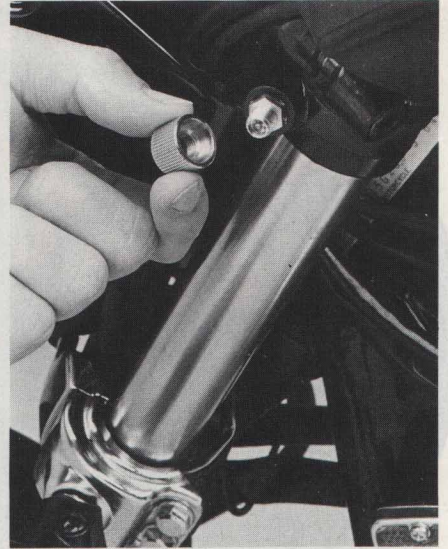
A microcomputer monitors seven areas and warns the rider of any potential problems with an LCD display.



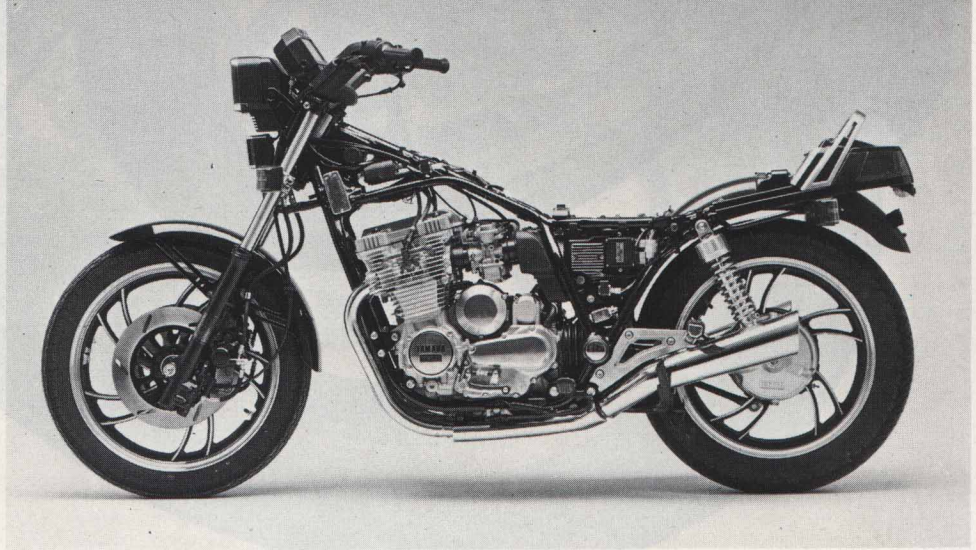
The front brake cylinder is hidden behind the headlight. Unfortunately, brake feel got lost in the move.



Stiff springs and useful four-way adjustable dampers give the Seca rear end a taut but controlled ride.

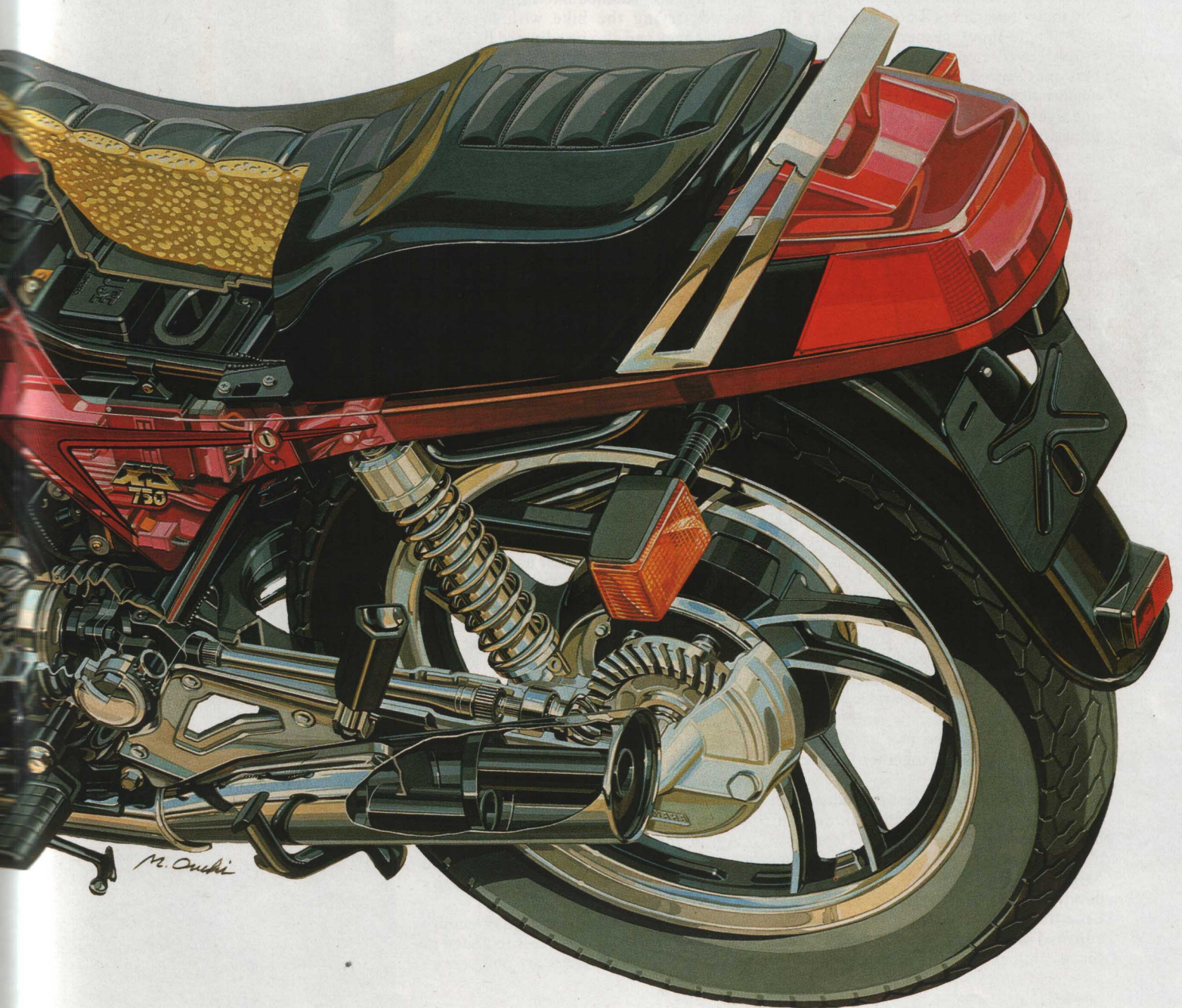


The air-assisted fork lacks a crossover tube but the collar-mounted valves provide convenient access.





INSIDE THE XJ750



YAMAHA IT250H

From Last Place to Winner in One Model Year.

■ Yamaha was one of the first Japanese motorcycle manufacturers to get serious about enduro bikes. The tradition began in 1968 with the DT-1, a street-legal machine that was so exceptional for its

time that many were stripped of road gear and became serious and successful enduro and motocross racers. Later came the ITs, with single-shock suspension and motocross-derived engines and if some of the first ones veered from the trail or kicked when not watched, still, they had power and every model year saw more steering precision and improved suspension. Rival factories have been doing as much work though, and last year the 1980 IT250 took a drubbing in our enduro comparison.

Because that didn't match what we've come to expect, and because a quick walk around the 1981 IT250H shows that's it's changed in just about every way possible, the IT250 was our first request for a Yamaha enduro bike this year.

We weren't disappointed.

The frame is last year's motocross frame with the proper enduro changes to it. A rear frame loop has been added so the long rear fender has good support, and small tubes commonly called six-day bars have been added under the sides and bottom of the engine. These bars protect the cases from rock damage but don't fill with mud like regular skid plates. Thus the bike doesn't get heavier during a mud run and engine cooling isn't blocked as it is with a normal skid plate. The rest of the frame is the same as last year's YZ. It's chromemoly steel, highly braced and stiffened with boxed-style gussets. Backbone and downtube pipes are large diameter tubing, smaller tubes tie the large pieces together and form the necessary triangles under the seat and engine. The new frame proved strong enough for the motocrossers last year, so it should hold together forever on an enduro mount.

The motocrosser likeness extends to the aluminum swing arm and aluminum bodied remote reservoir shock. The shock placement, length etc. is the same as the MXer. The difference is in spring and damping rates; slightly softer for the IT. Like the motocrosser, damping is easily adjusted with a twist of the fingers and spring preload only takes slightly longer.



The boxed aluminum swing arm on the IT looks much like the one on YZs and is. The main difference lies in the axle slot—it's open at the rear so the axle and wheel can slide out the back in one unit.

Suspension is finally a high point of the IT. Travel at both ends is just right, 10.6 in. Leading axle KYB forks with 38 mm stanchion tubes, lots of up and down adjustability. Double bolt triple trees and a four-bolt axle clamp take care of the front. Air caps are installed but Yamaha recommends trying the bike with 0 psi. Of course they can also be adjusted by changing oil volume, changing oil weights, or replacing springs with softer or stiffer ones that're available through Yamaha dealers.

The IT250H gets the smaller case MX engine. Of course cylinder porting, carburetion, pipe, silencer and transmission ratios are special for the IT's intended use. The MXer went to a five-speed for '81, the IT retains the six-speed—more gears are usually best for enduro terrain. Like the YZ250, the IT250 is fitted with a plastic box that's connected to the intake tube just in front of the six-petal reed cage. The system, called YEIS by Yamaha, improves low speed response and torque. The idea is, when the reed valve closes and pressure behind the reed increases, the pressure fills the box with premix instead of reversing itself and going backward through the carb; when the reeds open again, the stored fuel is instantly drawn into the engine. Of course the cycle happens hundreds of times a second.

The rear hub is a new item that's shared with the motocrossers. The spoke flange on the brake side is thicker and the aluminum sprocket is held on with tapered head bolts, not studs as before. The new bolt system is much stronger and should eliminate the isolated bolt shearing some hard riders experienced with the studs. A wide smooth aluminum rim is laced to the hub with larger spokes. The front wheel is also different. The hub is the same but larger spokes are used and the brake is equipped with the brake cam from the 250 motocrosser. The cam increases the power of the brake. Both tires are the rim saver type, meaning the tire rolls around the rim slightly and adds protection when riding in rocks. They are made by IRC but have square dimples in the knobs, like Dunlop's K190.

Equally impressive is the list of enduro items and time-saving devices included as standard equipment. There are pull bars on >





both axles, water drains on both backing plates. The side stand has an oversize foot so it won't sink into soft ground. The brake and shift pedals fold. The frame has mounting lugs for an add-on center stand. There's a sturdy tool bag on the rear fender. The seat bolts thread into the frame so there are no nuts to lose and the seat can be removed with one hand and one wrench. A plastic guard shields the chain from mud hurled off the rear tire. The kick start lever has a ribbed surface. The air intake is high on the bike. The air cleaner is easily reached without tools through the side of the airbox. Hand guards are standard. The headlight num-

ber plate is quickly removed by hand. The odo has a large reset knob and a magnifying lens, the snake headpipe is raised above the lower frame tubes to prevent damage, the silencer is quiet and equipped with a forestry legal spark arrester; tricks are every place you look.

Much thought has gone into the rear wheel on the '81 IT. It can be removed with one wrench if the vertical pins in the axle slot are removed and left out. (They aren't necessary anyway.) The brake backing plate doesn't use a regular static arm. The plate slides into a tongue on the swing arm, eliminating the need for an arm and the problem of one hanging up on rocks

and logs. The brake rod still has a quick release device and a bracket on the swing arm holds the rod out of the way while the wheel is being worked on. When the axle nut is loosened, back off the snail adjusters and slide the wheel forward. Roll the chain off the rear sprocket without bothering the master link, then slide the wheel out the back of the swing arm slots. It's quick and painless.

The IT's dimensions are as important as its specifications. Wheelbase has been increased by 1.6 in., to 58.5 in. Space allocations within that are greatly changed, as the swing arm is now 21.3 in. long, a radical gain from the 17.8 in. swing arm used



last year. The longer arm means the bike slides with more control, and power on a hill means the rear wheel digs in instead of the front wheel leaping up. The forks are pulled back a fraction, with steering rake at 29° instead of 29.5°, for quicker turns in the tight stuff. Usually steeper rake means less trail, but the engineers redid the offset of triple clamps from steering stem and added trail, so the 250H snaps between trees better and tracks at speed better.

Fitting that new swing arm inside the wheelbase gave another improvement, also thanks to the new engine cases. The swing arm pivot is now only 2.9 in. from

the countershaft sprocket, compared with 4.5 in. last year. Less distance, less change in chain tension with wheel travel. The bars are narrower, 33 in. vs 34, which quickens the steering but is still wider than the gaps between eastern trees. As a final fraction, despite the added wheel travel at both ends, static seat height has risen—clever!—by only 0.2 in.

Where sharing makes sense, for example the shorter dog-leg levers, the straight-pull geared throttle and the waterproof kill button, the IT and YZ share parts.

Where sharing wouldn't work, the IT is different. The old straddle-a-watermelon tank has been replaced by a larger one, 3.4

gal to 3.2 for '80, and the larger tank is wider at the front, narrower at the rear so the rider can move around more easily. Plus, the top of the tank is flat, just right for an enduro score card. The petcock is traditional Yamaha, with down for go, sideways for stop and straight up for reserve.

The all-white IT looks as serious as it is, and most riders who saw the new model liked it.

It performs as well as it looks. Steering, something no previous IT has done really well, is great. The front tire bites into corners and follows the rider's line, while there's no wander at top speed and the old >

Continued on page 38





TRACK TEST: Yamaha YZ250J

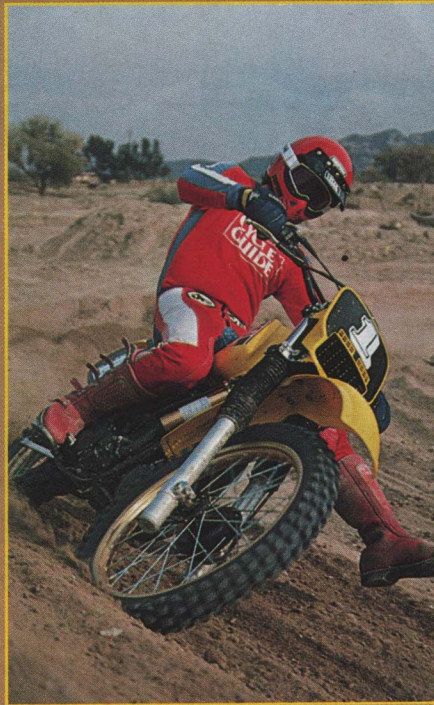
Yamaha's new YZ250J has a double mission in 1982. And the two tasks of the mission have produced the most radically changed motocross machine of a year that has been filled with radical changes.

The YZ's first job is to continue a Yamaha tradition of innovation. Over the last decade, that tradition has been developed through Yamaha's presentation of a series of technological firsts to the motocross world. It started with the early use of reed valves (or Torque Induction, as Yamaha still labels it) and continued with the Monoshock and last year's Energy Induction canister. Now the '82

YZ inherits the task of being the industry's innovator, and it answers the call well.

The 250J, along with its 125cc little brother, is the first mass-produced motorcycle to use variable port timing to aid performance, as Yamaha does with the Power Valve. It's also the first and only motocrosser to have a rear shock that offers both adjustable rebound *and* compression damping. And Yamaha tops off the package with a welcome seat design straight off the works machines. It extends forward over the tank and lets the rider climb up almost to the gas cap when cornering — without risking bodily damage.

These ideas maintain Yamaha's step-



liquid-cooled 250 further pricked Yamaha's corporate ego.

So, while continuing with innovation, Yamaha must also prove itself with existing technology. To this end, the YZ sports another set of radical changes over last year's model. The new Monocross rear suspension now features linkage between the swingarm and shock that transforms the Monoshock into a rising-rate system. And sitting under the front number plate, you'll find a radiator. Yamaha is using techniques borrowed from its 125 to produce its first quarter-litre water-pumper.

It's a strange position, but Yamaha has mandated the YZ to move ahead and catch up at the same time. And even if you don't care about Yamaha's corporate image or the reasons why the YZ has evolved into what it is, you had better pay attention to the YZ250's mission. Because its success or failure is not only going to affect Yamaha's position in the industry, but your position on the track as well.

Continued on page 29

ahead image well, but that's only half of the YZ's job. As odd as it may sound, the YZ must also play a game of technological catch-up in one of the very fields that Yamaha pioneered—single-shock suspension. Yamaha got a head-start in single-shocking back when Hakan Andersson Monocrossed across Europe in the early Seventies on the first modern-day one-shocker. But that advantage disappeared as the rest of Japan discovered how to make one shock do the work of two. The rising-rate systems of Honda and Suzuki pointed the way the rest of the industry would have to follow. And the fact that it was Honda that introduced the first



A legend and a half.



XT
500
250

Hardened bikers have been known to burst into song at the mere mention of the XT 500.

A big, rugged single in the classic British tradition, the 500 is as at home on the range as it is on the road.

A large flywheel magneto lends its powerful 4-stroke engine a hefty jolt of low-speed torque. Guaranteed zip at the lights, grip in the mud.

The lightweight parts, high-level exhaust, braced bars, crankcase shield and long-travel suspension have all contributed to the legendary, 'anything goes' reputation of the 500.

Small wonder, then, that we've translated this legend into a 250cc machine.

The XT 250 boasts the same on/off road capability as its big brother.

An overhead-cam, 4-stroke engine generates formidable torque at low revs.

And long-travel Monoshock suspension, tough plastic mudguards, lightweight chassis and rubber-mounted indicators give it the grit to slip straight from High Street to dirt track at the drop of a gear.

There you have it. The hard facts behind the XT legend.

We bet you didn't know the half of it.



Yamaha YZ250J: Will It Win?

• If a bike's personality were determined by its looks and features, the space-age Yamaha YZ250J would be a trim, ultra-horsepower radi-croster. With a seat that crawls over the tank and its Power-Valved engine, the Yamaha looks like nothing that roosted its way across the Pacific yet. But out on the track, looks aren't going to put the Yamaha on top. What matters is its performance, and in this respect, what the Yamaha delivers is far different from what



its appearance would have you believe.

The J-model actually isn't radical in performance at all. In spite of the roadracing heritage that the Power Valve gives the YZ, power is smooth and manageable with no uncontrollable top-end surge. YPVS takes last year's strong but pipey power curve and smoothes it out. The J-model hasn't lost any of its predecessor's top-end muscle, and now the powerband is broader, making the transition from low speed to top-end less abrupt. The J-model does, however, share some of the H's lack of grunt at the very bottom of the rpm scale. Even though the YPVS allows the new YZ to roll into its mid-range zone smoothly, below that zone is a no-racer's-land that has to be avoided with an occasional fan of the clutch lever. But the mid-range power is strong, and the new liquid-cooling system assures that it remains strong well into a moto.

The rear end of the Yamaha is just as mechanically radical-looking as the engine, with links and levers pushing and pivoting in plain sight, rather than hidden as on other single-shockers. Such an elaborate system again promises great improvement, and in this case, the YZ performs as advertised. The little holes and bumps—the ones that slowly wear a rider down throughout half an hour of moto-cruelty—disappear when they see the YZ coming. Past Yamahas have worked well in the big

whoops, but the linkage that gives the J-model its rising rate makes it the first Yamaha to swallow the little stuff as well. And the Monocross suspension system has the most adjustments available on a production motocrosser with its 24-way adjustable rebound damping and 10-way adjustable compression damping as well as two optional springs (one firmer, one softer). So if you don't like it as delivered, some time and experimentation can produce a machine that is personalized to your tastes. We felt that the stock spring rate was too soft for our 170- to 190-pound test riders, and Yamaha does claim that out of the crate, the YZ is set up for riders in the 145-pound range. But when the YZ was tested, the optional springs were not yet available.

Up front, the suspension is equally impressive over the little stuff but it also was too soft to suit the heavier crowd. A healthy handful of the excellent double-leading-shoe front brake going into a turn would cause the front end to dive and make the already-steep rake seem nearly vertical. And when exiting the turn, the soft rear would squat enough to result in rather slow and unresponsive steering. But there are two optional fork springs as well that should cure those problems.

But soft suspension is easy to fix; excessive weight isn't. And that, more than anything else, is going to hinder the Yamaha when it competes against the ultra-light machines of '82. At 235 pounds, the YZ weighs 18 pounds more than the Suzuki RM250Z. And on the track, it feels like an even greater difference. The radiator and shock are mounted higher than they are on any other watercrosser, raising the bike's center of gravity noticeably. Some of the YZ's extra weight is in the Monocross linkage, but most of it is in the beefed-up frame. Pro riders will want to start replacing bits and pieces all over the machine with trick aluminum goodies right away, in an effort to save as much weight as possible.

Novice and beginner riders, on the other hand, if they can learn to live with the Yamaha's heft, will find the YZ much more agreeable. In fact, the YZ's smooth power delivery will make it much more suitable for the less-experienced racer. But more-serious riders aren't going to turn in their best performances on box-stock YZs. Not until the time comes when races are won by looks.

—Ron Lawson

Yamaha's TR1 - top twin in streetbike racing!

Anyone with any doubts about the sporting capabilities of Yamaha's TR1 need only check out the style of American streetbike racer Chris Steward!

Campaigning the American 920cc version of the TR1 in the Streetbike class of the U.S. "Battle of the Twins" series, the 24-year-old from Los Angeles has already won the two opening events of 1982.

On the superfast speedbowls of Daytona and Talladega, the TR1 outsped, outhandled and outlasted opposition from Ducati, Moto Guzzi and BMW.

The possibility of a twin-cylinder class in the popular Motor Cycle News "Streetbike" series has already been discussed between sponsors and organizers. If this should happen, you can bet your life that Yamaha's TR1 will be a prime contender.



Chris Steward in knee-dragging action on the TR1 in the Battle of the Twins stock class at Daytona. Impressive handling for a completely standard machine!

YZ250J: Tech Inspection

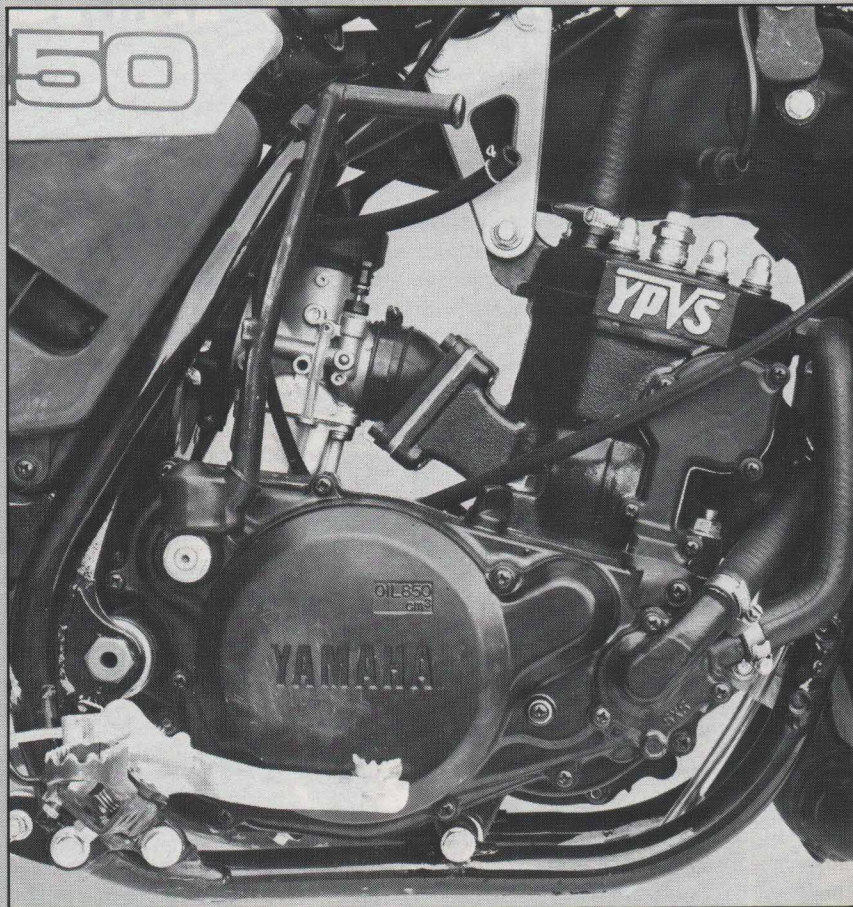
Engine:

Top End: Under the finless exterior of the YZ250J's liquid-cooled barrel are found four conventional transfer ports assisted by one boost port. The upper edge of the YZ's intake port window, which previously was straight, now droops downward so there is less stress on the piston's rear skirt. A 38mm Mikuni carb feeds the intake port through a six-petal reed valve. The J-model's reed petals are thinner than those used on the H-model to improve fuel flow at low rpm. A far more radical change can be found in the exhaust port which is now centrally located and fitted with the Yamaha Power Valve System (YPVS) to broaden the engine's powerband (see YVPS, page 86). Machined aluminum surfaces constitute the seal between the new head and barrel, supplanting the usual copper head gasket. Two large O-rings, however, are also used at the head/barrel joint to contain coolant as it flows through the top end. From there, the 1000cc mixture of anti-freeze and distilled water flows to a triple-clamp-mounted radiator through sealed passages in the frame backbone, steering head and fork triple clamps.

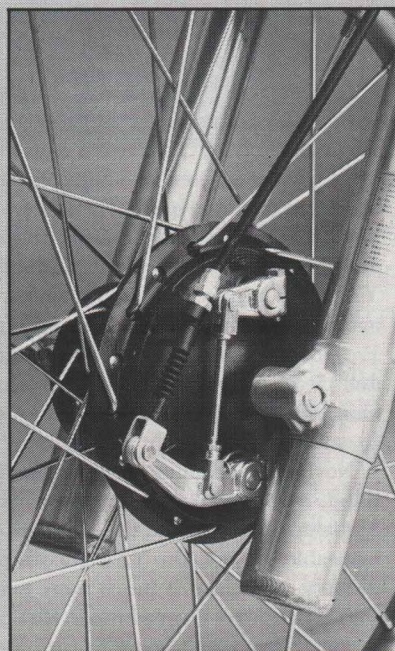
Bottom End: The righthand end of the full-circle crankshaft now carries three pinions. Inboard of the main primary-drive gear is another straight-cut gear that drives the Power Valve's centrifugal advance mechanism. On the outboard end of the crank is a narrow helical gear that spins the water pump's six-bladed impeller. On the opposite end of the crank lives the internal rotor for the YZ's capacitive-discharge ignition.

Drivetrain:

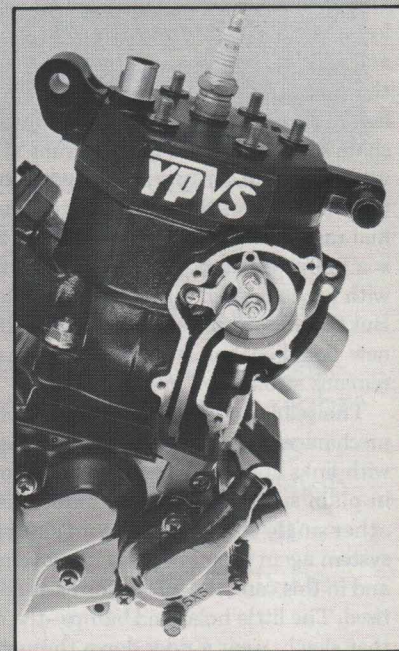
Because the J-model YZ has those two additional gear drives on the crankshaft, it has straight-cut primary-drive gears, rather than the helical type used on previous YZs, to reduce driveline power losses. To decrease the clutch chattering that was prevalent on the H-model, the J's clutch basket has narrower fingers extending to engage the seven plates—one more than last year. Those plates have correspondingly wider tangs.



The J-model loses an Energy Induction canister but gains a water jacket
And the Yamaha Power Valve system quenches an industry first.



The 250 gets its big brother's brake
Double-leading hand-me-down shoes.



Power Valve's mechanical linkage
Porting regulated by engine speed.

Gearbox: Improved heat treatment increases the strength of otherwise unchanged gears. A lighter detent spring reduces the amount of pedal-pressure needed for gear shifting.

Final Drive: The J-model's 3.46:1 final-drive ratio was made fractionally taller than last year's through a change from 48/14 to 45/13 gearing.

Suspension:

Front: New Kayaba fork sliders are made from straight aluminum tubing, with the axle-mounting lugs heat-shrunk into place. Yamaha claims this process makes the new sliders less expensive to manufacture than the old forged sliders. Inside the massive 43mm stanchion tubes are the same straight-wound springs used in the H-model fork. But damping rates have changed considerably, with standard compression damping decreasing due in part to a change from 10 weight fork oil to 7.5 weight, and in part to a change in valving. Even with the thinner oil, though, rebound damping is increased through the use of smaller orifices.

Rear: Those front suspension changes were made to better suit the new rising-rate Monocross rear suspension (see "Monocross," page 86). A shorter deCarbon shock and an extruded (rather than box-section) swingarm are connected

by an L-shaped aluminum bell crank. Needle bearings are used in the pivots between the bell crank and frame pivot, and between the crank and swingarm. A long collar inside the shock's lower bushed mounting prevents the bush from being pinched by an over-tightened bolt. All these extra pieces are claimed to make the new Monocross rear end 2.3 pounds heavier than last year's design. But as well as rising-rate suspension, the new rear end offers 24-way-adjustable rebound damping and, for the first time, 10-way-adjustable compression damping.

Wheels:

The front brake now uses the double-leading-shoe backing plate employed on Open-class YZs since 1980. The tab that locates the backing plate to the fork slider has been positioned horizontally to make wheel installation easier. New IRC tires have a different rubber compound and taller knobs for improved traction on loamy tracks.

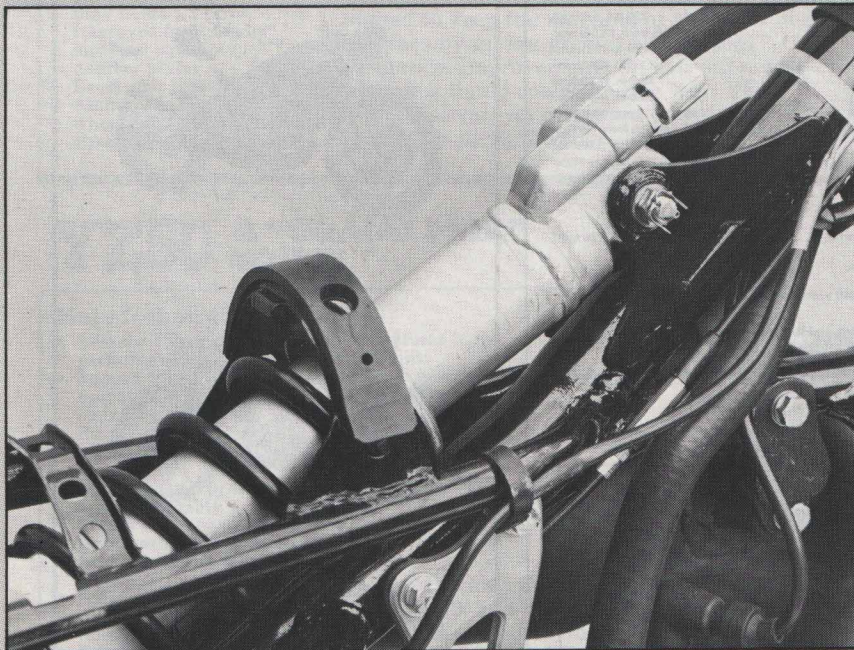
Frame:

The single-backbone frame has a relatively steep head angle of 27.5 degrees, one degree less than last year's. To maintain

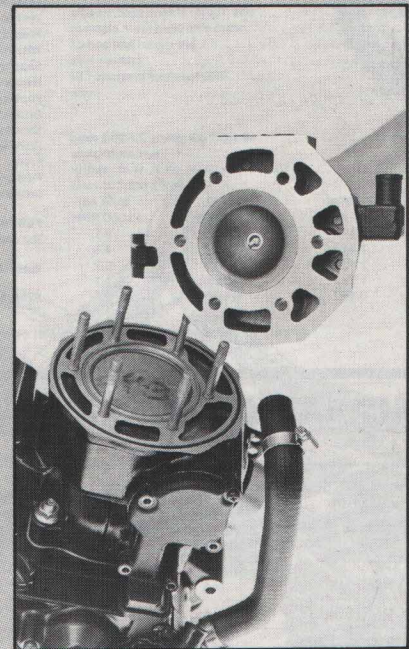
straight line stability with that quicker steering geometry, the YZ's wheelbase is almost one inch longer than the H-model's. The single front downtube now splits into two engine cradle tubes much closer to the steering head to allow the centrally located exhaust pipe to exit the cylinder. The rear frame tubes have been increased in diameter and wall-thickness to handle the higher stress load imparted into the Monocross linkage pivot.

Details:

To allow the rider to sit further forward more comfortably in the turns, the YZ's new seat extends almost to the gas cap. The seat is stuffed with higher-quality, denser foam to increase its service life. A larger airbox volume allows better air flow and easier access to the same dual-layered conical foam element. Square number plates are designed to meet AMA regulations. Foam inserts prevent mud build-up in open cavities in the swingarm. Alloy brake arms are now used on both hubs and a new brake pedal has a more compact pivot mechanism for its folding tip. Yamaha no longer uses rubber covers over the air valves in the fork caps. The YPVS motor no longer uses the YEIS canister on its inlet system, although its mounting bracket is retained. The inlet manifold and YEIS canister from the new 490 are a bolt-on replacement.



Compression-damping combines with the YZ's rebound and spring options
To give you 720 ways to adjust the new Monocross rear suspension.



Two O-rings replace a copper gasket
To keep the YZ's head tight.

Continued

Yamaha YZ250J



SPECIFICATIONS:

MANUFACTURER: Yamaha Motor Corporation, USA
6555 Katella Avenue
Cypress, California 90630

CATEGORY: motocross

SUGGESTED RETAIL PRICE: \$2179

ENGINE

Type liquid-cooled two-stroke vertical single
Port arrangement one reed-valve-controlled intake,
four transfers, one booster transfer,
one variable-height exhaust
Bore and stroke 70.0mm x 64.0mm
Displacement 246.3cc
Compression ratio (corrected) variable from 7.0 to 8.6:1
Carburetion one 38mm Mikuni slide/needle
Air filter washable oiled foam element
Lubrication pre-mixed fuel and oil
Starting system primary kick
Ignition internal-rotor magneto CDI
Charging system none

DRIVETRAIN

Primary drive straight-cut gears; 2.625:1 ratio
Clutch wet, multi-plate
Final drive #520 chain (5/16-in. pitch, 1/4-in. width);
3.462:1 (45/13) ratio

Gear	Internal gear ratio	Overall gear ratio	MPH per 1000 RPM	
			4.1	4.8
I	2.143	19.471	4.1	4.8
II	1.813	16.469	6.2	7.7
III	1.412	12.828	9.2	
IV	1.143	10.385		
V	0.957	8.691		

SUSPENSION/WHEEL TRAVEL

Front air-spring, 43mm stanchion tube diameter/
11.0 in. (279mm)
Rear Monocross, 24-way adjustable rebound damping,
10-way adjustable compression damping,
25mm spring preload adjustment/11.0 in. (279mm)

BRAKES

Front drum, double-leading shoe
Rear drum, single-leading shoe, rod-operated

TIRES

Front 3.00 x 21 IRC Motocross Z MKII
Rear 5.10 x 18 IRC Motocross Z MKII

DIMENSIONS AND CAPACITIES

Weight 235 lbs. (107kg.)
Weight distribution 48.5% front, 51.5% rear
Wheelbase 59.0 to 59.5 in. (1499 to 1511mm)
Seat height 37.0 in. (940mm)
Handlebar width 33.0 in. (838mm)
Footpeg height 16.0 in. (406mm)
Ground clearance 12.5 in. (318mm), at engine cradle
Steering head angle 27.5 degrees from vertical
Front wheel trail 4.65 in. (118mm)
Frame tubular chromoly steel, single front downtube
Fuel tank plastic, 2.5 gal. (9.5l), no reserve
Instrumentation none

PERFORMANCE

Top speed (observed) 80 mph (129 kph)

WARRANTY: none

AVAILABLE COLOR: yellow only

All weights and measurements are taken with machine unladen and fuel tank empty

COMPARATIVE TEST DATA:

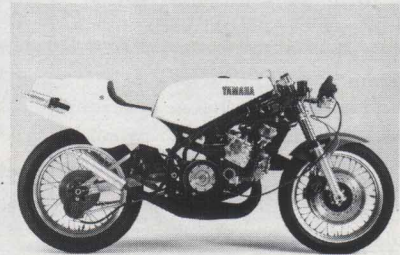
Make & Model	Horsepower	Wheel Travel Front/Rear, in.	Weight (fuel tank empty), lb.	Weight bias Front/Rear percent	Transmission, number of speeds
Yamaha YZ250J	NA	11.0/11.0	235	48.5/51.5	5
Suzuki RM250Z	NA	10.3/11.0	217	47.5/52.5	5
Suzuki RM250X	NA	10.5/11.3	219	47.0/53.0	5
Yamaha YZ250G	27.5	11.6/11.7	217	46.5/53.5	6
Kawasaki KX250A6	26.8	11.3/11.2	230	46.5/53.5	5
Honda CR250R-80	27.5	11.6/11.7	222	47.0/53.0	5

From Championship to Customer

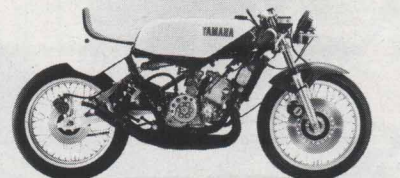
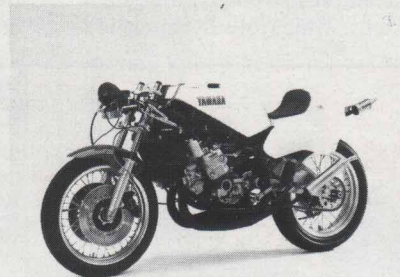
The Yamaha TZ500 which heads the production road race range for 1982 is identical in all major respects to Kenny Roberts' 1980 World Championship-winning machine.

The 500cc four puts out well in excess of 100hp and features the Yamaha Power Valve System and reversed outer cylinders first introduced on the Roberts championship-winner.

Yamaha's production road race range for 1982 is completed by the bike that has been the backbone of 250cc racing for so long, the well-proven and always-successful TZ250 twin.

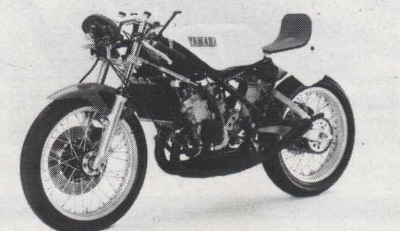


The Yamaha TZ500



TZ 250 '82

The Yamaha TZ250



TZ 250 '82

YZ

THE FACTS

Yamaha asked you to wait. We hope you did and if you've had a chance to see the new bikes you're pleased you did...right.

In any event, for those who have not seen them, here's the facts...no bull.

YZ125LC

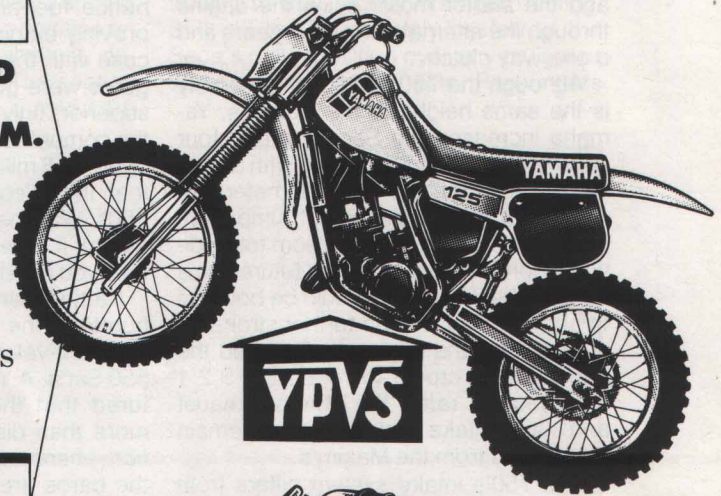
Main technical features

- Powerful liquid-cooled Torque Induction engine with YPVS
- Newly-designed air cleaner, combustion chamber and expansion-chamber muffler
- Durable, easy-to-handle clutch and transmission
- Rigid, strong high-tensile steel tubular frame
- New rising-rate Monocross suspension system using separately adjustable expansion/compression damping shock absorber
- The combination of enlarged fuel tank and extended seat offers better riding position
- New square type number plate and improved front fender
- Convenient detachable side stand

GP-PROVED POWER VALVE SYSTEM.

SPARE PARTS KIT

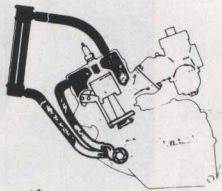
The YZ125 was the first YZ machine to employ a liquid-cooling system for higher racing performance. The '82 model comes with a number of new technical improvements including the race-bred YPVS (Yamaha Power Valve System).



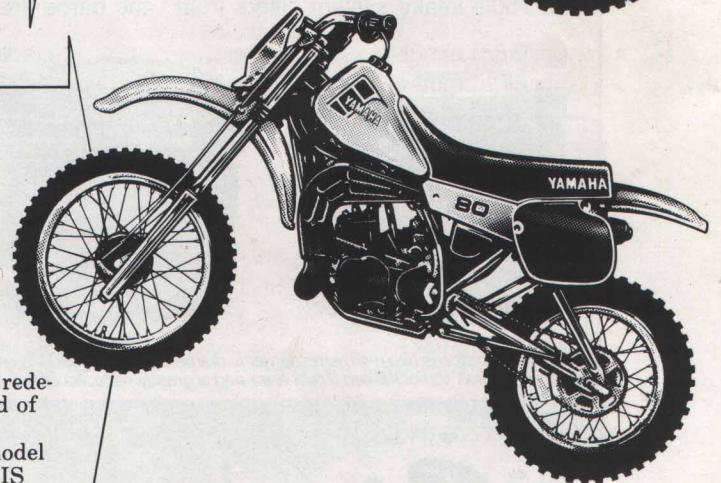
YZ80LC LIQUID-COOLED AND COMPLETELY NEW.

Main technical features

- Newly designed liquid-cooled Torque Induction engine with YEIS
- Near-square type bore and stroke for excellent torque and power
- Strengthened con-rod and newly designed expansion-chamber muffler
- Increased wheel travel front and rear
- Extended swingarm and increased-stroke shock absorber
- Adjustable damping and gas-pressure De Carbon type damper with remote reservoir
- Newly designed fuel tank and extended seat for increased freedom of riding position. Enlarged fuel tank holds 5.2 litres of fuel.
- Improved front fender and new square type number plates
- Bevel-gear throttle grip
- Aluminium front and rear wheel rims and strengthened rear axle



The sensationally new YZ80 has been redesigned to keep the machine at the head of its class by giving greater racing performance. Improvements on this '82 model include a liquid-cooled engine with YEIS which delivers an increased power output of 19.5 PS at 12,250 rpm.



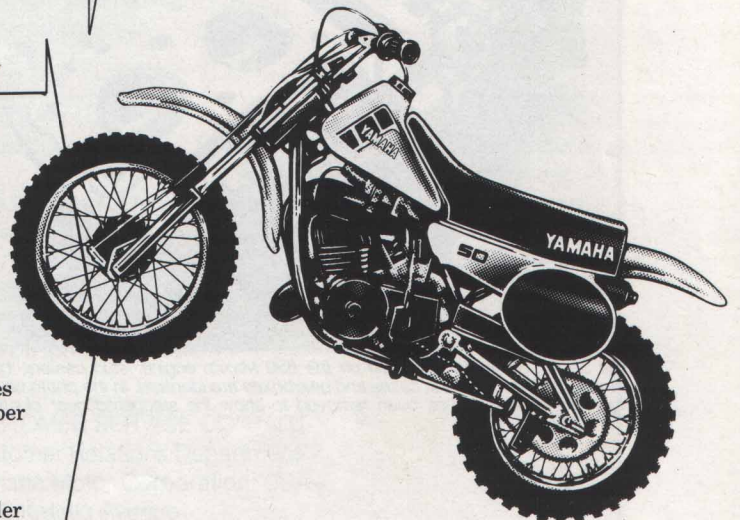
YZ50 A "GRAND PRIX" TOUCH.

Main technical features

- 2-stroke Torque Induction engine features high performance and outstanding durability
- 5-speed transmission ensures positive gearshift operation matching the engine's power characteristics
- Strong and rigid semi-double cradle frame
- Leading-axle front forks provide extended 110mm wheel stroke
- Monocross suspension system ensures greater manoeuvrability and riding stability
- Sturdy high-tensile steel wheel rims and new tread pattern tyres give better roadholding
- Improved drive chain tensioner
- Extended seat helps the rider adopt best riding position
- F.R.P. fuel tank reduces total machine weight
- Improved front fender and new square type number plates

This model retains all the proven features of the '81 YZ50, and also provides a number of new technical improvements for increased racing performance.

The seat has been extended forward and lapped over the fuel tank, allowing the rider a wide range of riding positions for greater control.



YZ...what else!



YAMAHA 750 SECA

ing all gear ratios from the large primary-drive spur gears down to the shaft final drive. The XJ750 features the Maxim's unusual engine-narrowing layout, which places the alternator and starter behind the crankshaft. The crank drives the alternator through a strong Hy-Vo chain, and the starter motor spins the engine through the alternator via spur gears and a one-way clutch.

Although the 750's cylinder assembly is the same height as the Maxim's, Yamaha increased the Seca's stroke four millimeters. This figure, along with a two-millimeter increase in bore diameter, accounts for the displacement jump from 653 to 748cc. There is still room for additional bore increases; should future plans dictate, the 750 engine could be boosted to about 900cc with no further stroke increase. Yamaha engineers flattened the 750's piston crown to retain the 9.2:1 compression ratio; the 28mm exhaust and 33mm intake valve diameters remain unchanged from the Maxim's.

The 750's intake system differs from

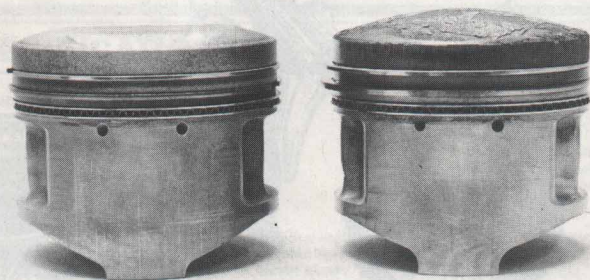
the 650's by incorporating some of the new technology introduced on the 550 Seca we tested in February. The 750 features the Yamaha Induction Control System (YICS) the factory developed in an effort to improve fuel economy. The YICS uses a system of interconnected sub-intake ports that sends a swirling charge into each combustion chamber to enhance fuel-air turbulence, thereby improving burning efficiency. As was the case with the 550, the 750's mileage figures were good, if not overwhelmingly superior; only back-to-back testing with the competition will tell for sure. We averaged 43.8 miles per gallon, slightly better than the mileage we recorded with other 750s. With the Seca's five-gallon fuel capacity, it takes you about 219 miles before you run dry.

Rather than the Maxim's 32mm carburetors, the 750 wears 28mm Hitachi constant-velocity units like those on the 550 Seca. A Yamaha spokesperson ventured that the YICS affects induction more than displacement affects induction—hence the smaller carbs. Though the carbs are smaller than average for

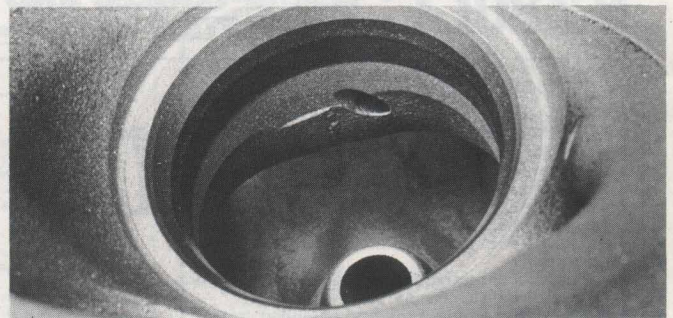
current 750 fours, the Seca's performance does not suffer.

The XJ requires only a brief warm-up session. The "choke" lever is mounted on the left handlebar for convenient access, and the 750 runs willingly on part choke, displaying none of the hesitation and staggers common to so many of today's lean-running machines. The engine pulls smoothly and willingly from just off idle; rolling on the gas at an incredibly low 1000 rpm in fifth gear with a 300-pound load produces nary a cough or stumble. The Seca pulls well through the entire rev range, but the fat portion of the powerband lies from 7000 rpm to the 9500-rpm redline.

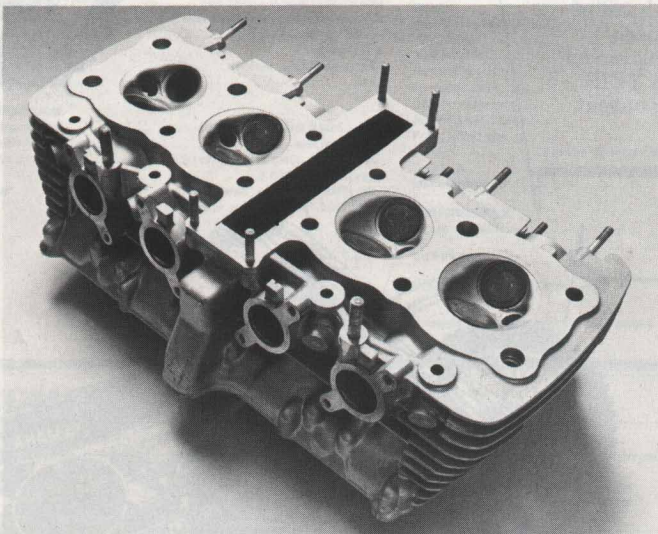
We staged some roll-on contests against a Suzuki 750 and found some mildly surprising results. The Seca pulled out a small edge and held it when we started at low-end and mid-range engine speeds, and the Suzuki pulled out a small advantage and held it during high-rpm comparisons. The Seca's smaller carb size clearly helped engine response at low-rpm levels. Otherwise, the two bikes were matched fairly evenly in power. The



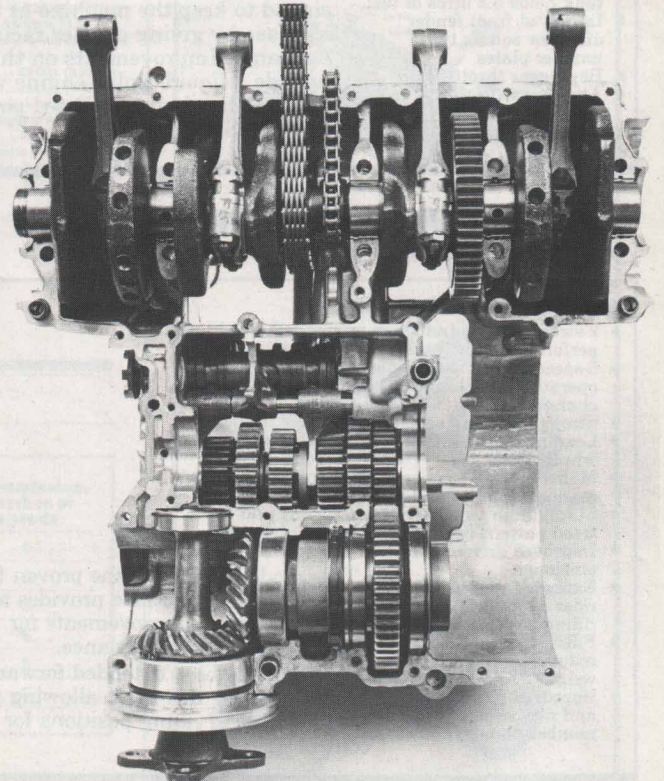
The 750 Seca piston is two millimeters larger in diameter than the 650 Maxim slug. It has a wider skirt for increased thrust area and a greatly reduced crown height.



The small, angled YICS sub-intake port swirls the incoming fuel charge to enhance air/fuel mixing, thereby improving mileage through better burning efficiency.



The Seca powerplant is based on the 650 Maxim engine; stud centers, bore centers, valve diameters, cases and gearboxes are identical. In the photo on the right the input shaft has been removed to show the staggered gear clusters.



YAMAHA 750 SECA

Seca's respectable drag-strip time of 12.49 seconds at 104.89 mph reflects this parity, especially considering that the shaft drive makes the XJ prone to wheel-spin when getting off the line. Overall, at the dragstrip or in a backroad contest, the outcome depends as much on rider expertise as on horsepower.

The Seca's strong engine runs less smoothly than the Suzuki 750 or the kindred Yamaha 550 and 650 fours. The XJ750 starts out smoothly, but it sends a

noticeable tingle through the handlebar at 4500 rpm, which works out to 60 mph in top gear. From 4500 rpm on, bands of vibration rise and fall in intensity while the buzz travels from handlebar to seat to tank to footpegs. After a long stint in the saddle, the most noticeable aftereffect is a light tingling sensation in the hands. The vibration never becomes troublesome, but on a long trip it can be mildly irritating.

Our testers rated the riding position on the Seca 750 as good to excellent, depending on the rider's size. The seating layout positions the rider in a mild café

racer crouch; the rearset pegs, contoured seat and relatively low handlebar set the rider forward, leaning slightly into the wind for support. Our under-six-foot testers found the seating position ideal; our taller riders said they would prefer a flatter bar with slightly less pullback. The cupped seat also prevented our longer-legged riders from sliding backward, adding to that slightly cramped feeling. Still, all testers strongly preferred the Seca's riding position over any cruiser or standard-style motorcycle. Passengers

Cycle **Test Specifications** **YAMAHA XJ750RH SECA**

Make and model Yamaha XJ750RH
Price, suggested retail (as of 3/26/81) \$3199

PERFORMANCE

Standing start ¼-mile 12.49 @ 104.89
Engine rpm @ 60 mph, top gear 4499
Average fuel consumption rate 43.8 mpg
Cruising range, main/reserve 171/48.0
Load capacity (GVWR less curb weight) 217.1 kg
(478.5 lbs.)
Maximum speed in gears @ engine redline (1) 47.1
(2) 68.7 (3) 89.3 (4) 110.4 (5) 126.7

ENGINE

Type Four-stroke, transverse four, air-cooled with two overhead cams, chain-driven
Bore and stroke 65.0 x 56.4mm (2.56 x 2.22 in.)
Piston displacement 748cc (45.6 cu. in.)
Compression ratio 9.2:1
Carburetion (4) Hitachi 28mm constant velocity
Exhaust system Four into two
Ignition Battery-powered, inductive, magnetically triggered
Air filtration Paper element, disposable
Oil capacity 3.5 liters (3.7 qts.)

TRANSMISSION

Type Five-speed, constant-mesh, wet clutch
Primary drive Spur gear, 1.67:1
Final drive Shaft and helical-bevel gear, 4.18:1
Gear ratios (overall) (1) 15.29 (2) 10.48 (3) 8.06
(4) 6.52 (5) 5.68

CHASSIS

Type Twin-downtube, full cradle frame
Suspension, front Leading-axle, coil/air-spring fork with 144mm of travel
rear .. Swing arm with (2) dampers adjustable for preload and damping yielding 90mm of travel

Wheelbase 1445mm (56.9 in.)
Rake/trail 28° / 114mm (4.49 in.)
Brake, front Hydraulic, dual-disc, 298mm (11.7 in.)
rotor, with single-piston caliper
rear Rod-actuated drum
Wheel, front Cast, 19 x 1.85
rear Cast, 18 x 2.15
Tire, front 3.25 H 19 Bridgestone Mag Mopus-L303
rear ... 120/90-18 65H Bridgestone Mag Mopus-S716
Seat height 782mm (30.8 in.)
Ground clearance 138mm (5.4 in.)
Fuel capacity 14.9/4.1 liters (3.9/1.1 gal.)
Curb weight, full tank 263.5 kg (521.5 lbs.)
Test weight 309.1 kg (681.5 lbs.)

ELECTRICAL

Power source Three-phase alternator
Charge control Solid-state voltage regulator
Headlight beams, high/low 60/55 watts
Tail/stop lights 8/27 watts
Battery 12V 14 AH

INSTRUMENTS

Includes Speedometer, odometer, tripmeter, tachometer with 9500-rpm redline, fuel gauge.
Indicators for high beam, turn signals, neutral, sidestand extended, burned-out headlight or taillight, low oil, battery and fuel levels.
Speedometer error,
30 mph indicated, actual 29.13
60 mph indicated, actual 58.93

CUSTOMER SERVICE CONTACT

Customer Relations Department
Yamaha Motor Corporation, USA
6555 Katella Avenue
Cypress, California 90630
(714) 761-7439

PRIDE AND PREJUDICE

The 'joys' of owning a British lightweight

When I was seventeen I bought my first motorbike. It was a secondhand B.S.A. Bantam which cost me forty pounds. I didn't know anything about bikes but I needed a cheap form of transport. I was assured by my brother and dad that a simple British two-stroke bike wouldn't give me any trouble and would be perfect for my needs.

Who was I to argue? Dad had been a dispatch rider during the war and since then had had a series of B.S.A.'s, A.J.S.'s and Matchlesses. Brother Brian had inherited the mechanical genes and had been tinkering around with rusty heaps of metal ever since I could remember.

They came and chose the bike with me and the moment we got it home began to strip it down. This was the wonderful thing about solid, honest British bikes: they positively invited you to take them apart. Oil-sodden rags, frayed tempers, lost ball-bearings, freezing cold nights in the garage and the smell of 'Swarfega' hanging over the house were part and parcel of owning a 'real' motorbike.

Of course, those "Japanese upstarts" just coming on to the market didn't count. In fact, it was rumoured that the kids who were buying them could actually be seen riding the things at weekends when every decent British bike was where a bike belonged—in bits in the garage.

I didn't question the sense of this judgment even after I'd been back to riding the bus more than a few times in the first couple of months when the bike's clutch had gone again or the lights had packed up. At least, dad was getting a lot of fun playing around with the bike, and the oil leak from the crankcase wasn't too annoying unless you were wearing your best shoes.



To be honest, I was rather proud of having grime under my fingernails. It made you feel superior not to have been taken in by all that flashy chromium plating.

After struggling on with the Bantam for a few years, I progressed to a two-stroke Francis Barnett which Brian had resurrected from the scrap heap. There was no denying it was a lovely bike. Even in the 1960s it was a curiosity which aroused interest whenever I rode it. It was a shame I didn't get to ride it more often, really. But I was used, by then, to the regular overhauls that British classics needed.

When I moved away from home I left it behind me because I didn't have the skill, facilities or time to keep it on the road. And anyway, I'd become fed up with being late for work and always smelling of oil. I was quite upset then, when, a few years later, my wife got a job where she needed our car. My heart sank at the prospect of a return to my motorbiking days.

I happened to confess these feelings to a sixth form student of mine who came to school on a motorbike. I was surprised that he didn't seem to know what I was talking about. I glanced at his fingernails and was shocked to see that they were clean. On further questioning it turned out that he'd never ridden a British bike!

Suddenly, a lifetime's ingrained prejudice began to slip away. A previously unthinkable idea began to take shape. I wondered how they'd take the betrayal at home, but I didn't care. Secretly, I'd always felt envious of all that chrome. I swallowed hard. "What sort of bike have you got, then?"

"Yamaha RS100" was the reply, and the die was cast!

Yamaha Seca *Continued*

have adequate if not spacious seating, and the raised grab rail provides a sure handhold.

The rearset shift linkage does not hamper gear changes at all. The Seca shifts cleanly and positively; missed shifts and false neutrals are rare. The gearbox ratios are spread well, even though they also suit the less powerful XJ650. The one fault, an excessive amount of driveline snatch (not to be confused with the typical torque reaction of most shaft-drive bikes), causes fits of lurching and jerking in stop-and-go and in-town riding.

The Seca's lighting is excellent: the quartz-halogen headlight throws a broad, bright beam, and an auxiliary 35-watt quartz "driving light" throws a separate spot of light. In addition to the normal indicators, the 750 features a "computerized monitor system." The system uses a liquid crystal diode (LCD) display to warn the rider of any potentially dangerous conditions the motorcycle develops, including: sidestand extended, low levels of brake fluid, engine oil, battery acid or fuel; and a burned-out headlight or taillight. The system includes also a bar graph-type fuel gauge that reads fairly proportionally. The control system runs down this LCD checklist when you first start the engine, and constantly monitors these areas while you ride. Manual controls allow you to check the system at any time, and an override system lets you cancel the flashing warning light.

We had an opportunity to check some of these warning indicators, and the computer passed along the correct warning. The system is functional since it keeps track of most of the elements likely to cause problems for motorcyclists. It also appealed to some of our testers because it's a flashy bit of technology, even if it is a gimmick.

And so it is with the Seca itself. It's functionally sound *and* flashy—that's how it faces the stiff competition in the 750 class. And although Yamaha imposed some key designs—such as the remote front brake cylinder and low seat height—despite their impact on function, the XJ750 works very well as a sport bike. The Seca also succeeds because it has innovative features; the anti-dive braking is a major advance in motorcycling technology.

But don't fool yourself into thinking that innovations come free. At \$3199, the Seca costs \$300 more than the Kawasaki 750 and \$200 more than the Honda and Suzuki options, significant differences in price. However, when you are spending money at the three-grand level, two or three hundred bucks probably won't stop you from getting exactly what you want. If you're looking for the newest, flashiest and most functionally innovative 750 sport bike around, you'll have to choose the Yamaha Seca 750. ●

—Robert Hubbleday

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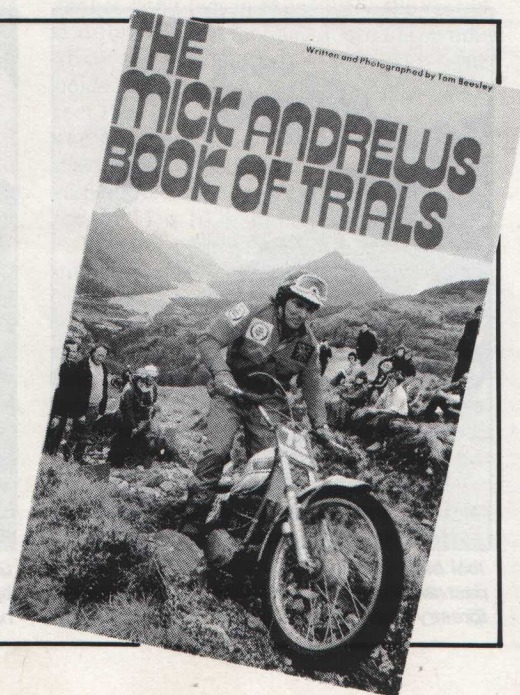
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Continued from Page 25

monoshock kickback is gone ... or if it isn't, the rider can dial damping and preload until it works for him.

The light clutch doesn't slip or drag, there's primary kick start of course and if most of the mid-range punch comes from the new engine, well, the gear ratios match up with no gaps.

Starting is much improved for '81. Cold starts are usually a two kick affair, warm starts one kick. Warm-up is rapid and the engine doesn't cough or blubber when taking off after minimal warm ups. The IT's new larger silencer emits an acceptably quiet sound and shouldn't offend many.

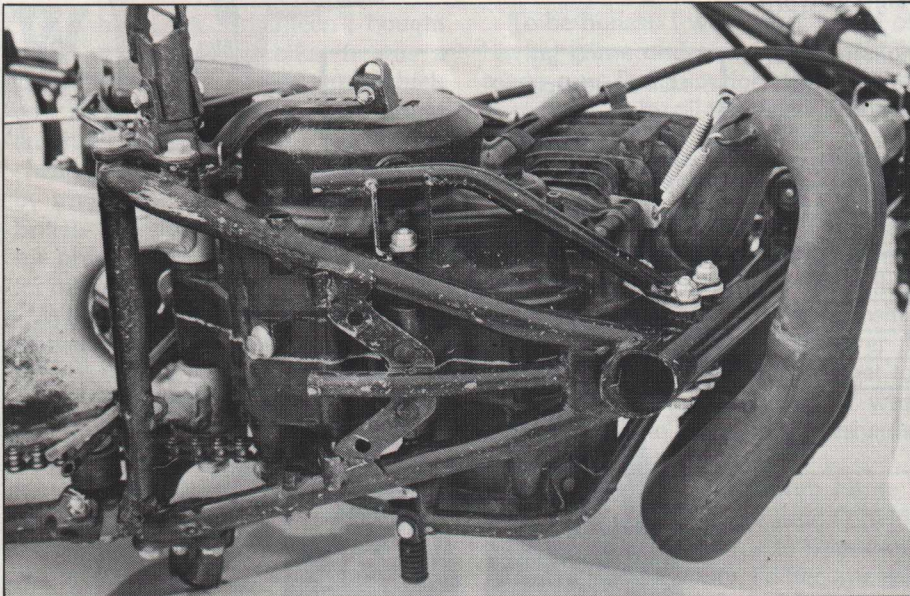
The new engine has a much improved powerband and overall power. Mid-range power is a wide smooth band that starts at quarter throttle and continues past three-quarter throttle. Low-end power still isn't a match for Kawasaki's KDX or Can-

Am's Qualifier but its not bad. Engine tuning is intentionally aimed at a wide mid-range and low and top-end power are somewhat subdued as a result. Thus, the engine's power matches the rest of the new IT's image; a serious enduro bike for medium to expert riders. Novice and C riders may have a little trouble with the power transition from the first quarter of the throttle to the mid-range. Level ground won't pose a problem, hilly terrain may take a little practice. If the engine power drops into the first quarter throttle while part way up a hill, it's hard to get back into the mid-range without downshifting. And the first quarter of the powerband doesn't deliver outstanding performance. Making it over the hill won't be a problem; low will take the bike nearly straight up. And as long as an aggressive pace is maintained, the bike will rocket over the top. If the

rider has to slow for any reason, regaining the lost speed isn't easy. Hitting or fanning the clutch motocross style doesn't work on the IT. Downshifting is your only choice. Again, aggressive riders won't have any problem, C's will need a little practice. Most riders adapt quickly.

The new IT250 is such a good bike, we had trouble finding much wrong with it. One small complaint was voiced by a couple riders though. Changing idle speeds requires loosening a lock nut first. Kind of dumb on an enduro bike. A large plastic knob like Kawasaki's KDX uses would make adjustment quick and easy without tools, a minor but sometimes important function.

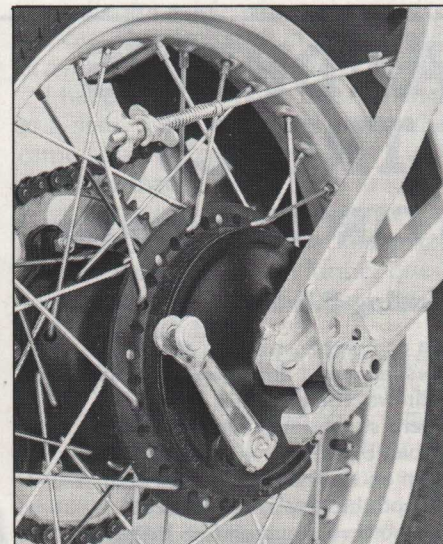
Faulting the overall handling of the IT is hard. It does almost everything well. The brakes are strong and progressive, position on the bike is nearly perfect,



Frame rails protect engine cases, don't block air flow or trap mud like a normal skidplate. Rubber pads are placed between the rails and engine cases so the rails can't bend back into the cases. Shift and brake pedals fold.



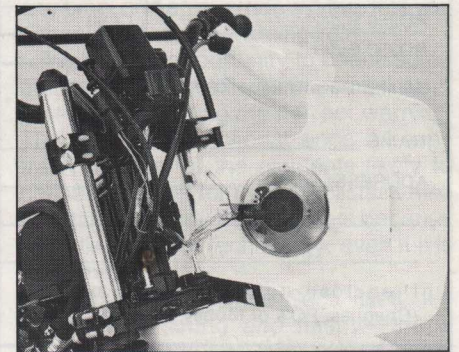
Tool bag is a nice shape and doesn't protrude past the top of the seat. Silencer is quiet and forestry legal. Fender has an integral tail light.



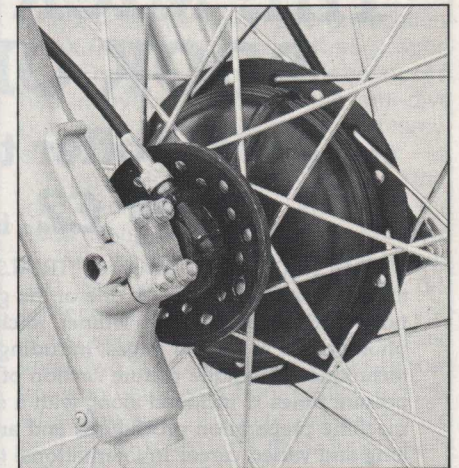
Quick-detach brake rod is held out of way in a bracket on the swing arm. Aluminum swing arm has an open slot axle to quicken wheel removal.



Odo has a magnified lens. Reset knob is large and easily reached while riding.



Headlight/numberplate is quickly detachable without tools. Forks offer lots of height adjustment.



KYB leading axle forks have a 4-bolt axle clamp on the right side. Axle has pull bar to ease removal.

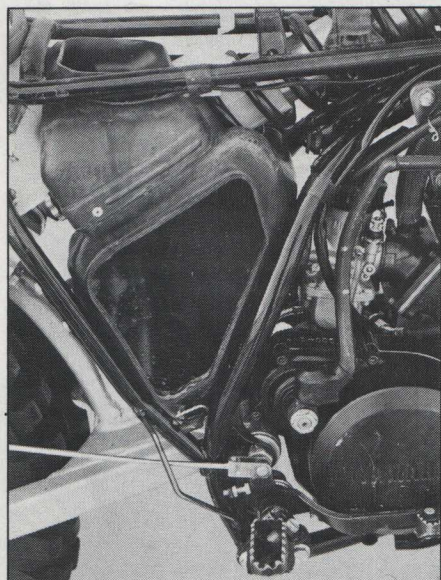
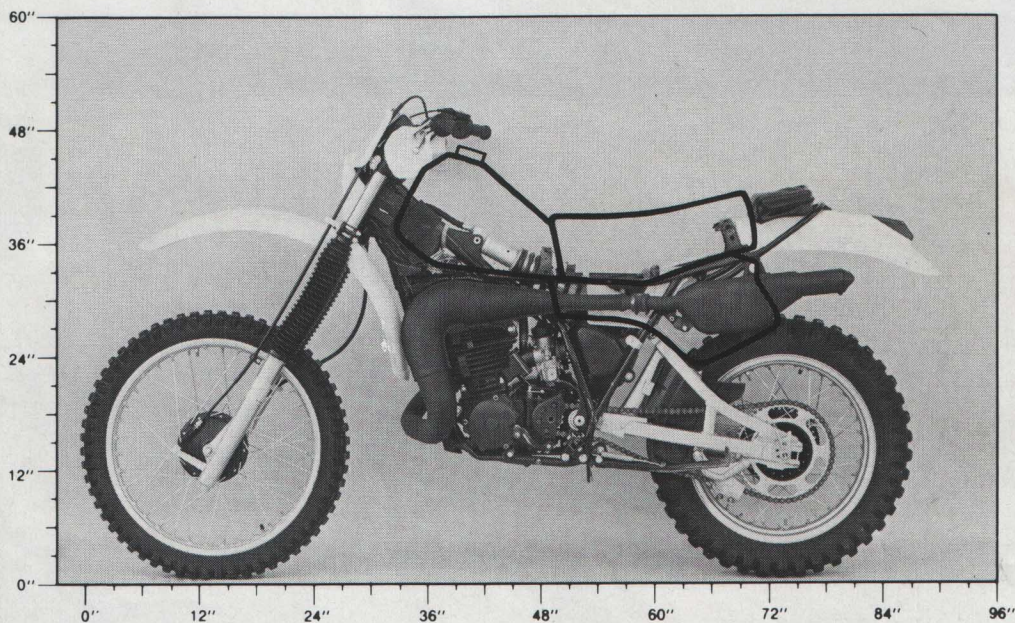
YAMAHA IT250H

SPECIFICATIONS

Fork travel10.6 in.
 Fork stanchion
 tube diameter38mm
 Rear wheel travel10.6 in.
 Front tire3.00-21 IRC MXZ
 Rear tire5.10-18 IRC MXZ
 Enginetwo-stroke Single
 Bore x stroke70 x 64mm
 Piston displacement246cc
 Compression ratio7.8:1
 Claimed powerna
 Claimed torquena
 Carburetion36mm Mikuni
 IgnitionCDI
 Lubrication systempremix
 Primary drivehelical gear
 Gear ratios, overall: 1
 6th8.19
 5th9.79
 4th11.71
 3rd14.68
 2nd18.74
 1st24.99
 Oil capacity1.6 pt.
 Fuel capacity3.4 gal.
 Fuel tank materialplastic
 Swing arm material .aluminum
 Starterprimary kick
 Air filtrationoiled foam

Frame material .. chrome-moly
 steel
 Wheelbase58.5 in.
 Seat height36.2 in.
 Seat width5.7 in.
 Seat length20.3 in.
 Seat front to steering
 stem center15.0 in.
 Handlebar width33.0 in.
 Footpeg height15.5 in.
 Footpeg to
 seat top21.1 in.
 Footpeg to shift
 lever center6.0 in.
 Footpeg to brake
 pedal center5.6 in.
 Swing arm length21.3 in.
 Swing arm pivot
 to drive sprocket
 center2.9 in.

Gas tank filler
 hole size2.1 in.
 Ground clearance11.3 in.
 Fork rake angle29°
 Trail4.96 in.
 Test weight w / half
 tank fuel248 lb.
 Weight bias, front /
 rear percent ...45.8 / 54.2



Airbox is large and has a high mounted air intake. Side cover of airbox is easily removed without tools.



Clear top straight-pull throttle is gear driven. Lever brackets are easily changed without removing grips or throttle. Grips are good.




Shock rebound damping and spring preload are easily adjusted; the knurled ring adjusts damping, the double nuts adjust spring preload.

steering is great, tires are very good, spokes don't loosen excessively, the seat is comfortable, the tool bag doesn't protrude above the seat where it's in the way—yet holds a good supply of tools, fenders protect the rider well, the odo is easy to read and reset—although the ultra quick reset has been dropped, and the six-day frame rails protect the engine well. As a bonus, the '81 IT is 10 lb. lighter than last year.

Yamaha's '81 IT250 looks and sounds impressive because it is.

Sounds good, huh? Last year was painful. The 1980 IT250 drew as tough a review as we had all year. Not even the factory had much to say about that, because what we wrote was what we got. We can't take credit for the improvements, though, because the '81s were designed before the comparison was in print.

If the rest of the IT line is like the 250, you can expect an invasion of white bikes on the starting lines at enduros across the nation. And, you can look for many of them in the winner's circle. 

The TR1. Our latest answer to the Superbike.

The TR1 1000c.c. overhead cam. V-twin.

Because, let's face it, a big multi isn't everybody's idea of a dream machine.

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The 75° V-twin engine unit is a piece of cake to maintain. (As if you'll ever have to.)

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It also boasts a Monocoque frame derived

from our racing machines which incorporates Yamaha's unique Monoshock suspension system.

Other features include 5 gears, transistorised ignition, dual horns, hand operated choke, sporty cast alloy Italic wheels, quartz Halogen headlight and upswept exhausts.

There you have it, problem and answer.

