



NO WELSHING!

The Welsh Two-Day lasted just one for Team DBR's Honda XR350. Half the event was enough to show that Honda are almost – but not quite – there with a four-stroke enduro bike.



LOCATION TEST

We'd been drooling over it ever since the first pictures left Japan. We fondled it lovingly when the first pre-production model went on show in this country in December. We adored it when we had our first chance of a quick scoot round a field on the first runner. All we were waiting for was a chance to race it in earnest.

Perhaps that was part of the problem. Honda's XR350 had a lot of build-up to live up to. It also had the unenviable task of surpassing the reputation of its little brother – the XR200, darling of four-stroke fans. Everyone rated the 200 as a magic clubmans bike – if only it went a little faster, and handled a little better at speed. Of such things dreams are made.

Unfortunately, there's never a simple solution, especially with the oriental penchant for complexity. There was a time when it was sufficient just to drill a bigger hole for the piston and slap on a bigger jug for the old amber fluid. No longer. Now you feed a clean sheet of paper into the master computer and re-design the concept.

That's how we end up with yet another completely new motor, technically superb on theory but thin on proven history. Yes, we know Rudge had radial valves a half a century ago but they didn't put them in a 250lb enduro bike. The lesson of history is that the simplest solutions work and last longest.

If you're beginning to get the impression that this is going to be a critical revue of the XR350, you're part right and part wrong. It's a tale more in sorrow than in anger. The XR350 is still a lovely, charming motorbike. It just isn't the earthshaker it might have been, and without pinpointing a particular fault, a gut feeling remains that it has something to do with that over-complex construction.

Have Honda got their sums wrong? Not necessarily. Like many previous Japanese models, the design is dominated by a desire to please the sales demand in the States. There they have a long-running dilemma in enduro terms because of the major division that exists between East and West. The West Coast has the vast Californian deserts and flat-out hare-and-hound events. The East has dense forest and tight-turn woodland events more like timed trials. The bikes and riders needed for each are very different, and rarely, if ever, meet.

After all, there's 2000-odd miles in between.

If you want to know what a West Coast racer feels like, ride an XR500 with its ton-up potential and total straight line stability – just don't try any tight turns. Well, you don't need to change direction very fast when you've got a hundred square miles of desert to corner in. The characteristics of the XR350 are at the other extreme. It has a restricted top speed even with a six-speed gearbox, and will just crawl past 70mph with the engine screaming. All the engine technology has gone into smooth, stepless power delivery.

The key statistics, however, are in the chassis. It's short, with a steep head angle. Despite weighing-in with the 500s, the XR350 has a shorter wheelbase than any 175 class machine – apart from the XR200 that is. But even then it has two degrees less rake than its little brother – making the steering head even steeper. It actually has an inch less trail than the current XR200R and no one would accuse that nimble little log-hopper of steering like a freight train.

The measurement of trail is a direct reflection of how a bike steers. A lot of trail, like chopper custom road bikes, and you can lay back and fold your arms down the straights, but you'll need a roundabout to turn. A little trail, like a trials bike, and you can turn the bike in knots, but you'll have your hands full going down the back straight.

A happy compromise, for a particular bike for its own peculiar conditions, should be somewhere in between. But then even if you have a small amount of trail for quick steering, you can compensate to some extent by lengthening the wheelbase to claw back some stability. That stability is important. It's the thing that stops the bike jack-knifing when both wheels start hopping off terra-firma. It's the thing that keeps the steering under control when you're going steadily sideways. The XR350 doesn't have it.

Most other Japanese enduro bikes have the magic formula of trail versus wheelbase because they are basically derived from motocross bikes. Even the once flighty XR200 gained it because they based the new model more closely on the CR125 chassis. The XR350, however, is completely new from tip to tail. It has no heritage. It's a new design concept and as far as European con-

ditions are concerned, it doesn't work as well as it might. As an enduro bike, it makes a very nice trail bike. The tragedy of the XR350 is that it's not that far out. It's just a good example of getting carried away with novelty and innovation and losing sight of the basics.

Honda brought 200 XR350s into this country and all of them were immediately snapped up.

Eight of the bikes started in the Welsh Two-Day last June, one of them the *Team DBR* test bike provided by the importers, Honda UK. We collected the bike some ten days before the event in order to get familiar with it and set it up to personal preference.

It already had the first modification. The early batch of bikes had too weak clutch springs causing very bad slipping under load. Longer springs were fitted to cure this. Although the bike is sold as a competition bike with no warranty, Honda say they will 'treat sympathetically with a private owner who has a genuine problem'.

With stronger springs the clutch operation seemed a little bit heavier than Japanese norm but worked well enough. The clutch is necessary, not just for pulling away, but also for changing up in

forks have got two low-friction bushes in the sliders instead of one, making the action even smoother – so smooth, in fact, that the front end feels oversprung. For peace of mind we replaced the standard fork oil, which is supposed to be about 8w, with 10w Putoline – 556cc per leg. Like most modern forks, they also tended to pump up with air, which would further increase the springing, so a regular chore was removing the caps to let them down. At one stage of riding they were found to have gained about 10psi.

The rear suspension was not so simple. A test outing found the back end extremely harsh and unpredictable. As well as variable adjustment on the single spring of the Pro-link, the Showa unit features both rebound and compression adjustment of the damping. This is great if you know what you're doing and everything is working right in the first place. Like anything however, when you introduce more variables, there's always more you can do wrong.

In desperation, as the Welsh loomed nearer, we took it to specialist Don Schmidt of Eastergate, Sussex, who can set-up

NO WELSHING

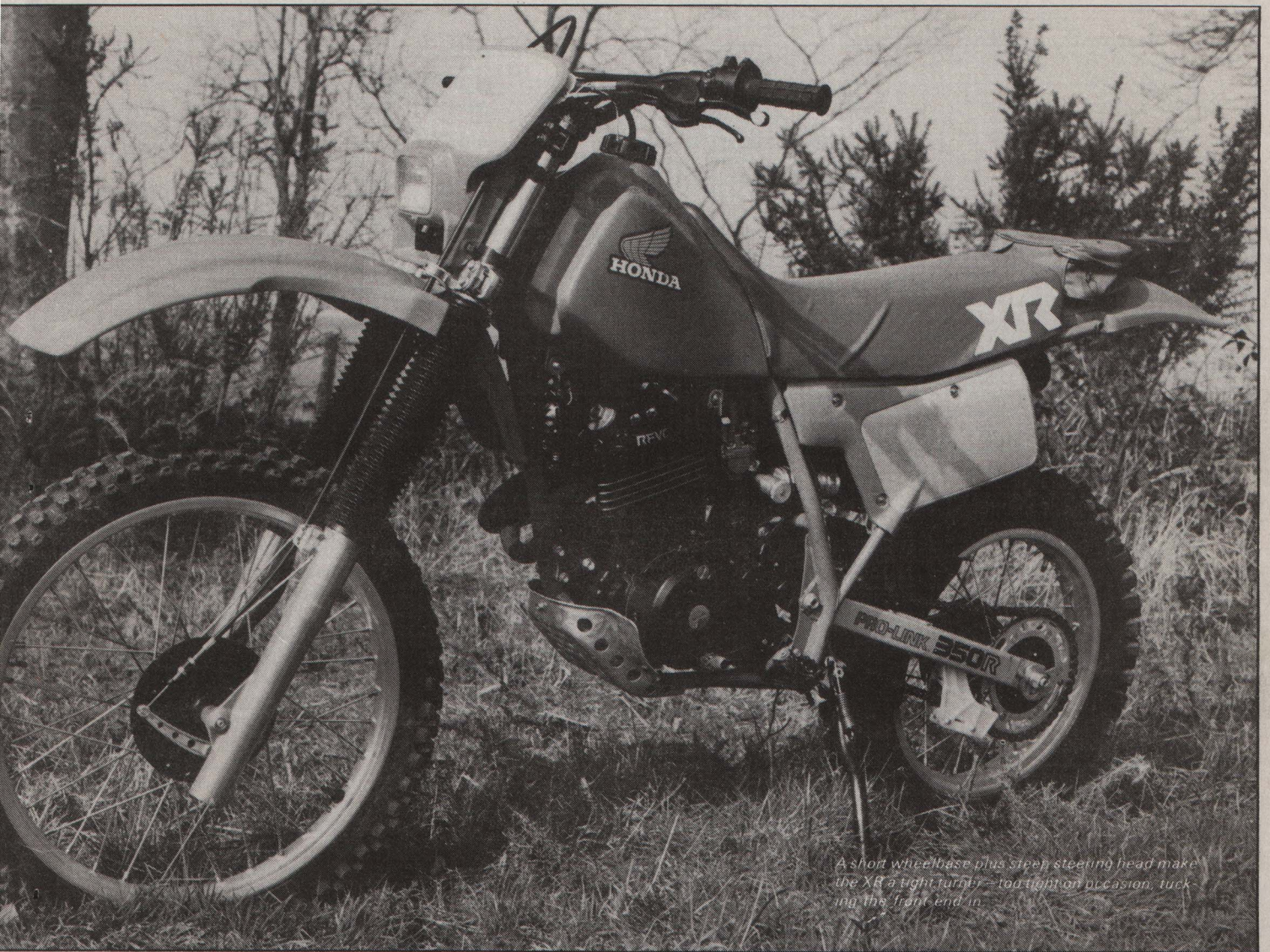
low gears. The XR350 baulks at shifting under load unless the magic wand is feathered.

Gearchanging at the pedal also proved a minor irritant, mostly because the only standard position for the lever is very low in relation to the footrest. Unless you're directly above it and can hook it straight up, you tend to bend the pedal backwards with your foot. This is made worse because despite having a steel pedal with a folding tip to prevent bending, some fiendishly clever Oriental with a 'Brack-and-Decker' has drilled a couple of holes right where it bends round the magneto cover to help it twist and foul the casing. With apologies to Honda UK for butchery, we took a hacksaw to the thin plate sprocket cover and cut it back, allowing the lever to be positioned higher. End of problem.

The suspension needed more thoughtful attention. The front



HONDA XR350



A short wheelbase plus steep steering head make the XR a tight turner – too tight on occasion, tucking the front end in.

such things in his sleep. Don suspected that the shock might have air trapped inside – a problem he has encountered on similar motocross units – and suggested draining, rebuilding and re-pressurising to standard spec.

Getting the suspension unit out is a tale in itself, requiring the removal of the airbox and the use of three arms. Once out the spring can be removed and the reservoir emptied. This is a job for a specialist and should not be attempted in your backshed with a screwdriver. Most of the unit contains oil, with a small amount of nitrogen at very high pressure compressed by a piston in the remote reservoir. This provides the compression damping and is adjusted by a 12-position knob on the side. The rebound damping, which alters the oil flow, is tuned by a 4-way adjuster at the bottom of the damper rod itself.

Drained of old oil, the unit is then re-filled with medium weight

oil and then pumped and re-topped till all air-bubbles have been forced out – a process very much like bleeding brakes – but because of the amount of oil, it takes a long time. This one took about four hours before it could be confidently sealed and re-pressurised.

Whether air in the system was the original problem is impossible to prove conclusively but certainly after the service the unit behaved impeccably. The settings favoured were No 2 on rebound and position 6 on the compression setting, with the spring about halfway screwed down.

Other mods before the event included shaving the leading edges off the brake shoes to try and remove some of the fierceness off the brakes, and filling the tyres with OKO sealant – an essential safeguard against Welsh booby-traps. The standard 'O' ring chain was removed and a regular 520 Izumi one used. The reason for

this was that while the standard chain seemed fair the split link proved impossible to remove without an extractor – not the sort of thing normally carried in an enduro toolbag.

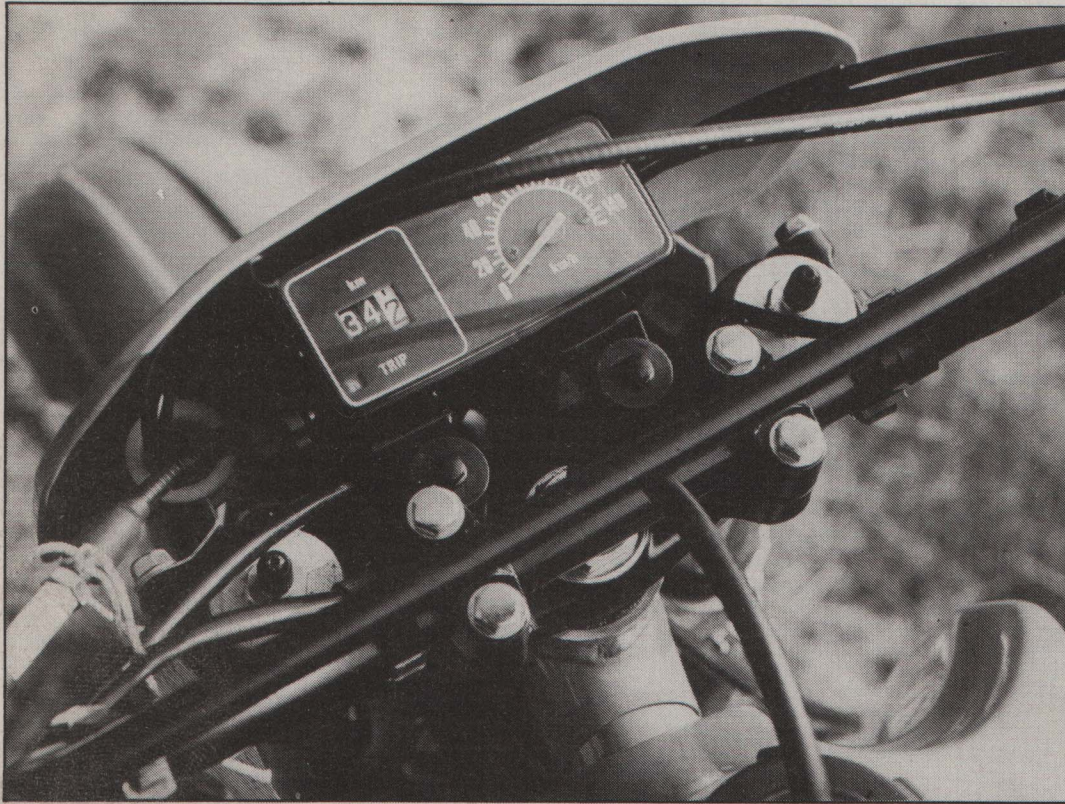
Another change that seemed innocent enough at the time was the handlebars. The standard bars are low with a curved rake that makes them limited in adjustment. Experience also tells that the standard bars bend easily. A pair of high-rise alloy Wassell bars were fitted, vastly improving the riding position, comfort and control. The only thing that didn't get transferred was the manual decompression lever. All the other controls have split clamps so they can be removed without touching the grips. The only way to get the valve-dabber off would have been to cut the standard grip and to spare Honda further carnage it was left alone. This was a mistake.

The only thing that remained

was to slide in the freshly cleaned air filter, bolt on the side panel, and load the bike, numbered, tooled and tanked-up, onto the *Team DBR* pick-up. It was the night before the Welsh and so far everything was going smoothly. As every dirt bike rider knows, every time he packs up for an event, that's exactly when things go wrong.

The very last bolt on the whole bike to be tightened was the third screw on the airbox cover. It screws into a metal-thread insert in the plastic airbox shell, not a nut but a round steel plug with serrated edges to grip the plastic. The trouble is when the thread tightens up it turns into a round file and very quickly scours out a neat hole in the soft shell. The side panel then yawns open revealing the soft underbelly of the air filter to the elements. There is a phrase for these moments. It is not printable in a magazine intended for those of a delicate disposi-

LOCATION TEST



Air forks aren't linked but otherwise everything here is as neat as Honda can be.

tion like this one.

Being unable to raise Workshop Manuel at this time as the pubs were open, the only solution was a merciless bodge with a three-inch bolt drilled through to the other side of the airbox.

Arriving at the lakeside at Llandrindod Wells, impromptu paddock for the Welsh, was a great boost for morale. The XR350 was among friends — there were four-strokes everywhere. It's very reassuring to know other people have got the same idea.

Unfortunately the Welsh organisers had other ideas. They'd decided to make the 1983 event tighter and tougher than ever before as a sort of curtain raiser for the October ISDE. What had been a nice clubmans ride round the mountains in previous years, was to become thrown well and truly in at the deep end of a Welsh quagmire.

It looked great on scrutineering day with the sun beating down and the skies clear. The gullible foreigners, like us English, were completely taken in. Only the locals knew that all those months of spring rain on the mountain tops were still making their relentless progress down into the valleys. And we were going up to meet it.

The main dangers of the Welsh are getting lost or falling into something unknown and unexpected. The best chance is in starting with a local, or someone who knows his way round, so you can stay with him till you find a pace that suits you. With a gaggle of XR350s listed together on start numbers we should have kept good company. As luck would have it, the one on the same start time as us was D Edmondson, taking time off from his normal CR250 for a bit of fun. So much for any chance of keeping the pace.

We suspected he knew something we didn't when the bikes were lined up in the parc ferme. Derrick's appeared to have grown an inch or two in the swing arm. It also sported a non-standard DEP pipe. Worse was to come when the bikes were wheeled out for the morning start. Nobody usually uses the minute's allowance for working on the first day.

But there's Derrick feverishly changing the carburettor jets. The other obvious thing is that he's junked the standard tyres and fitted a decent set of Trelleborgs. The reasons for all these changes are about to become obvious when the flag drops.

From cold, both bikes start on the second kick and *Team DBR*

and *Demon Derrick* set off side by side round the lake and onto the open ground. Then it's a climb onto gravel tracks before we get to the dusty bits where the first special test begins. Whether it's the heat, the altitude, or the apprehension of what is to come, our bike is already complaining on the overrun. It's got more snap, crackle and pop than your favourite breakfast cereal.

Derrick listens to it and raises his eyebrows with deep personal satisfaction. His bike is running perfectly. Now team tactics come into play. We decide to let Derrick tackle the special test first. There's not a lot of glory in being caught 90 seconds into the special test by a bloke who's started a minute behind you. The test itself is really good: lots of tight turns, tree roots and fresh green grass laced with a layer of dust from 200 others who have trod before, and not an inch of grip or a trace of a rut to hide in.

The XR350 just doesn't want to know. It's too early in the morning for these fun and games. The tyres just slide as if on marbles, while at the same time the steering forever wants to turn in on itself. It's too slippery to use the brakes, and it's too hard to steer on the power to make any

sense of the job.

Just when it's started to get itself sorted a ditch looms up with an awkward climb out. The bike is stalled, and the long process of restarting, which is going to take up a fair proportion of the rest of the day, begins.

Now a fair bit has already reached print on the subject of the XR350 starting ritual. The official Honda line is that there is no problem, and that it is just a knack. However, the owners manual does allude to it by advising that when the engine is really hot and has failed to start, it may be necessary to use the manual decompressor to clear the cylinder head of a build-up of fuel. The engine should then start normally. The key word is 'should'.

Now we didn't have the manual lever on the bike in the Welsh, and this certainly contributed to the problem. However, in talking with other owners and observing other machines in similar situations it has to be said that, whether you follow the rules or not, when the engine is hot, it can prove extremely difficult to restart. This is both exhausting and demoralising in an event, even when it may only take a matter of seconds. The cumulative effect is to destroy any rhythm or concentration in your riding essential in a long distance endurance battle like the Welsh. You become so intent on trying to keep the engine running that you make stupid mistakes, like choosing the wrong line through a bog because it looks easier, and stalling in the end as a result.

Even more exhausting is dragging the bike out of the bog when you've got it in there. It may only be 20lb heavier than an XR200, but it might as well be a ton. It's just higher and heavier enough to make all the difference when you're trying to manhandle it with everything pointing in the wrong direction.

Almost as exhausting is running with the bike uphill, trying to keep your fingers on the clutch, while your feet are paddling somewhere behind the back wheel, like some modern mechanical version of the medieval torture rack. This was another novel technique essential to competitors in the 1983 Welsh. It wasn't that the hills were that steep. They were just so slippery and went on for so long. When you arrive at the bottom of a hazard to find Derrick Edmondson coming down for a second attempt, you know you've got problems.

LOCATION TEST

NO WELSHING

Day One of the Welsh consisted of 143 miles of road, forestry, tracks and bogs, to be tackled in seven hours non-stop – an average of 20mph overall. It doesn't sound that long, or that hard, but when you're out there it seems like a lifetime. When you're a late number and well down on time, it's a long, lonely slog home with no-one to help lift you out of the mire. Of the eight XR350s that started the Welsh, only two started the second day. *Team DBR* wasn't one of them. After an enforced half-an-hour rest in a hillside swamp before the final check of the day, only the assistance of three passing Welsh trail riders got the bike out.

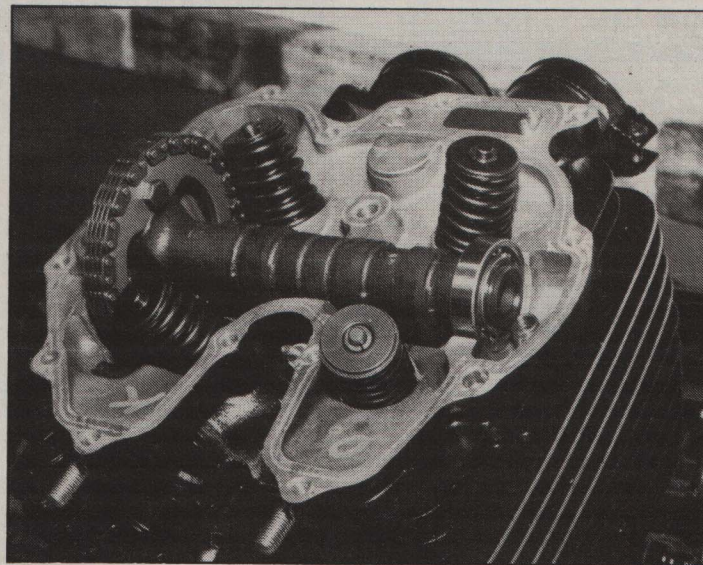
But that knocked the head on any chance of coming in within the hour time allowance for stragglers. Some riders who were actually over time on day one started day two, but overnight rain and dense mist in the morning dampened our enthusiasm for hurling the XR into even bigger disasters. The bike, after an uncomfortable night in the open in the parc ferme, pleaded to be left alone. The back tyre, which had been new before the event, was rapidly approaching the legal minimum tread depth, and we hadn't allowed for a change of rubber. Discretion was decided to be the better part of insanity.

Of the two XR350s that did start day two, only one finished. Derrick, after riding his heart out to get into a top six placing on day one, came to a stop before the first check with a bust ignition box.

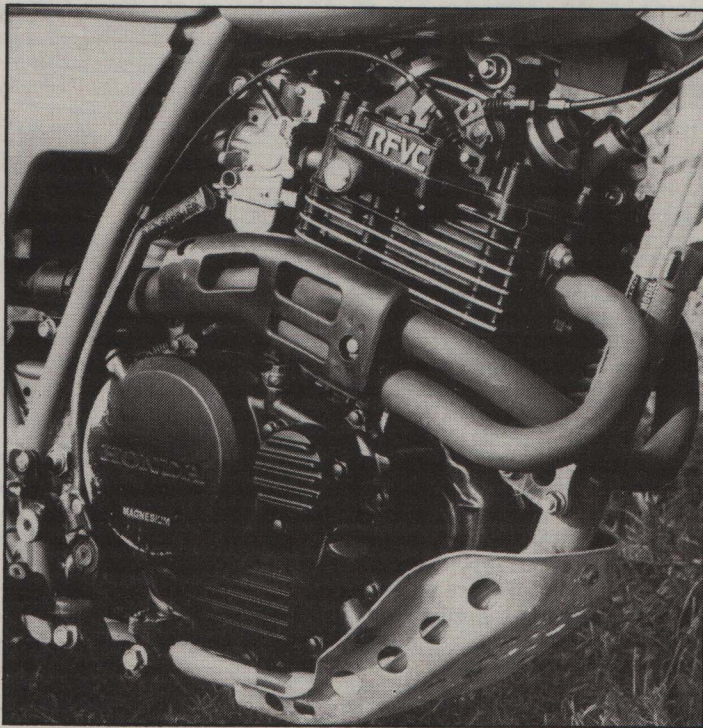
On reflection, it was a very cruel test of the bike. In previous years, on which experience we chose to enter it, the Welsh would have suited it. It remains an enjoyable bike to ride, smooth, forgiving and relaxing in reasonable conditions. But its good points are outweighed by its bad points when the going gets tough. It becomes unweildy, unstable and underpowered – all the things the XR200 isn't.

It's therefore difficult to find a comfortable niche for the XR350 in enduros in this country caught between the short circuit multi-lappers, and the long-distance arduous slogs. For both, an XR200 would still be a better choice for most clubmen.

The overall judgement has to be that it makes a very nice playbike, but for enduros it makes a very good advert for the XR200.

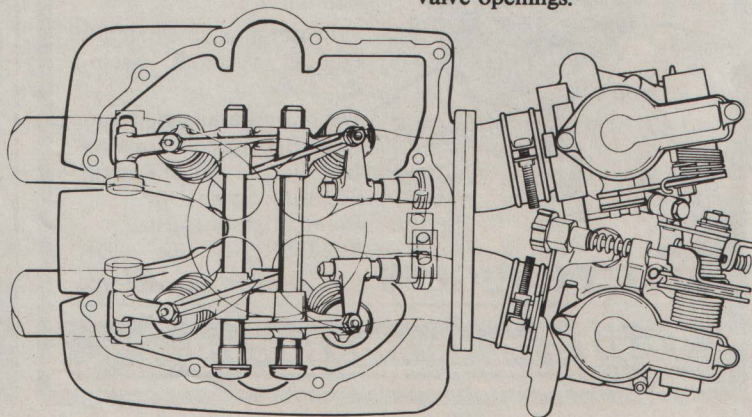


Top: Honda's radial valve cylinder head in 'metal.



Above: Despite being one of the most compact four-stroke motors about, when compared with a two-stroke the XR still seems huge and tall. Note the plug position – vulnerable to mud and water.

Right: Twin carbs of XR350 are for clean breathing throughout rev range – big four-strokes have a problem at very low rpm usually. They're linked by a read valve.



HONDA'S RADICAL RADIAL

Back in 1972 Honda introduced the XL250 trail bike with a four-valve cylinder head. The 250 unit was soon increased in size to 350 and 500cc models. Though it is debatable whether the first mild models were more powerful than two-valve equivalents, the theory for extra power potential was sound.

Main advantages claimed were that the smaller valves offer less inertia and so let the engine rev higher. Overall valve area is larger allowing more flow, and combustion chamber design (like a rooftop) gave swifter, more efficient burning.

Now Honda have decided to release models which feature another 'new' step forward. These are the XR350, XR500 and XL600 enduro models with RFVC (radial four-valve combustion) cylinder heads.

Again the design is not new. But Honda must be given credit for making the design work properly. In doing so they are creating a fresh buzz of excitement on the four-stroke scene.

The design allows the best of both worlds, say Honda. It combines a hemispherical combustion chamber with four valves. Though the 'pentroof' chamber, which until now has housed the four-valve system, is excellent for power, it is still reckoned that the 'hemi' head is better. The problem has been how to get four valves to fit and work in a hemispherical head.

In a pentroof design the valves stand side-by-side in pairs. Honda have used a single two-lobed cam, and one rocker arm with two fingers takes care of the paired valve openings.

NO WELSHING

HONDA'S RADICAL RADIAL

The new RFVC system uses a single cam with four lobes – one per valve. And there are eight rocker arms instead of the usual two. Each valve has two rocker arms. The main one is operated by the cam lobe and in turn it operates what Honda term a 'sub-rocker arm' which works the valve.

Not only does this engine have a new valve layout. It also has a twin carburettor intake system with reed valve. When you first see the motor with its twin carbs and twin exhaust pipes, it's easy to at first think that it is an ultra-compact twin.

The twin carb idea is to provide smooth and instant response from all rpm levels. Both carbs on the 350 (actual capacity 339cc) are 26mm Keihin. The throttle linkage is arranged so that the left (primary) carb slide opens first. This gives quick response at low rpm.

As the throttle is opened more, the main jet only second carb comes into play. At full throttle the slides are synchronised so that they both clear the carb throats at the same time.

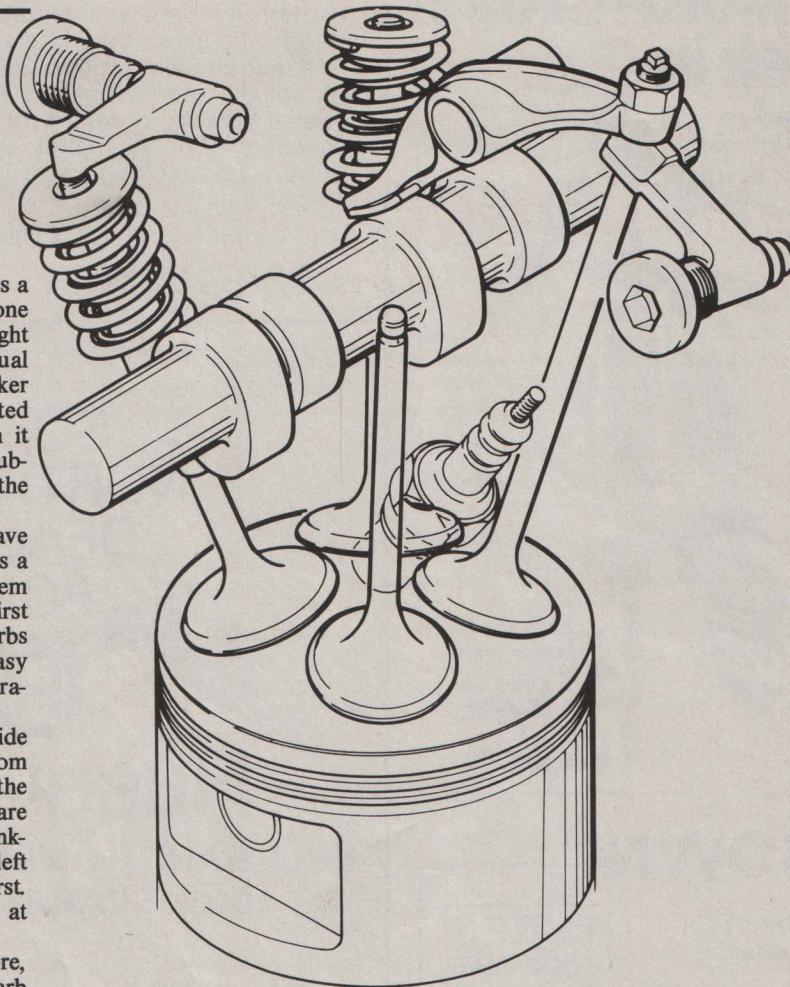
Again Honda are trying to give the rider the best of both worlds – good pick-up from small throttle openings and bags of choke area for flat out performance.

The reed valve aids low rpm running by allowing mixture to flow from the left inlet tract to the right inlet valve. This small gas flow also helps to prevent mixture in the combustion chamber from swirling past the right inlet valve into the inlet tract.

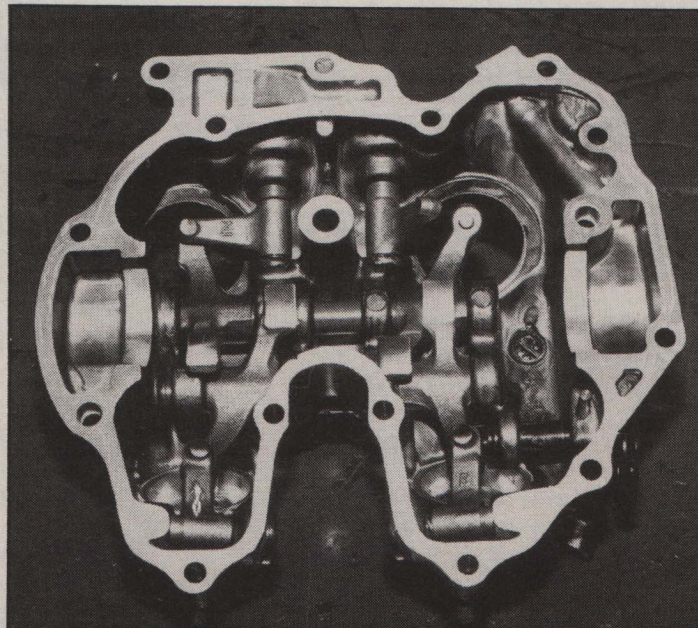
Once the right carb is operating the reed closes and both inlets are supplied independently.

One magazine which has dyno tested the 350 quotes 22bhp maximum at the back wheel. Considering the technology in this motor that figure is hardly inspiring. It's about the same as a BSA Gold Star 350.

Even so it's a very exciting unit with a good spread of power which is more important than sheer maximum bhp for off-road riding and racing.



Radial arrangement of valves makes for good combustion chamber shape but awkward operation. Honda solution is to add a pair of 'sub-rockers' turning the action through the relevant angle.



Inside of the Honda's rocker box showing how the sub-rockers turn the valve opening operation.



SPECIFICATIONS

Model Honda XR350R
 Engine..... 4-str single RFVC ohc
 Bore x Stroke 84 x 61.3mm
 Capacity 339cc
 Claimed power..... 31 bhp @ 7500rpm
 Ignition..... CDI
 Electrical 6v, 58w generator 35/35w headlamp
 Carburation ... 2 x 26mm Keihin
 Number of gears 6

DIMENSIONS

Wheelbase 1405mm
 Seat height.... 934mm
 Ground clearance... 310mm
 Dry weight.... 112kg

SUSPENSION

Front..... 31mm Showa forks, air-assisted, 280mm movement
 Rear..... Single Showa oil/nitrogen unit, Pro-link leverage, 270mm movement

BRAKES

Front..... SLS drum
 Rear..... SLS drum

TYRES

Front..... 90/80 – 21 6 ply Bridgestone
 Rear..... 130/80 – 17 6 ply Bridgestone

OTHER BITS

Fuel capacity.... 121 litres
 Lubrication ... Dry sump, 2 litres oil tank
 Primary kickstart ... Yes
 Decompressor. Manual and automatic
 Extras Tool kit and carry pouch, Speedometer and 100m trip meter
 Road legal No
 Price (inc VAT) £1445
 Importers Honda (UK) Ltd Power Road Chiswick London W4
 Bike supplied by..... Above