MOTOR CYCLE MECHANICS

MARCH 1979 50p

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CB650- Honda's sporting challenge

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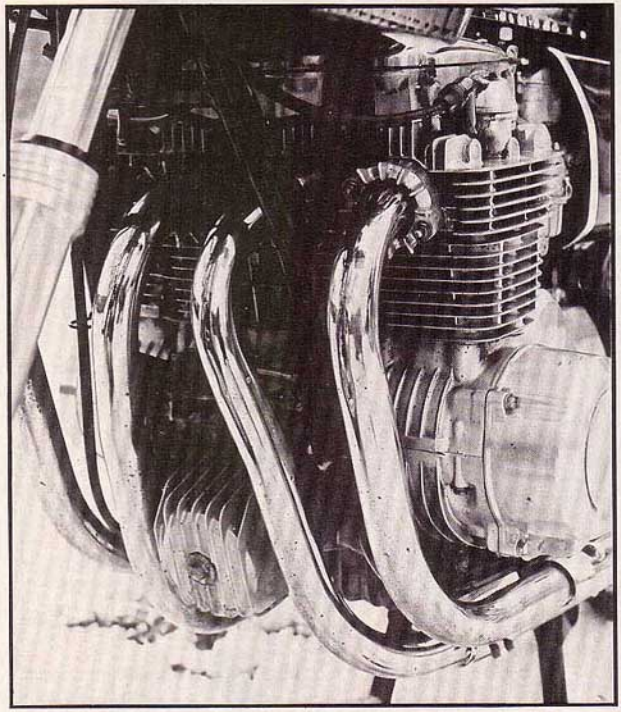
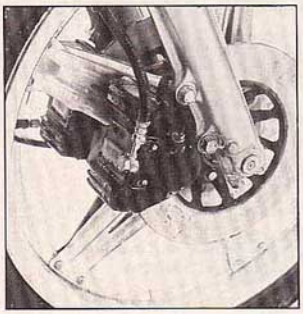
Honda CB650

Wearing the same European styling as the latest generation of Honda fours, the CB650 is not as new as it appears to be. The first giveaway signs come from the cylinder head where, unlike the FZ designs, there is only one camshaft and the orthodox, two-valve layout.

The 650 is, in fact, a logical extension of the popular 550, giving livelier performance from the uprated motor without the extra bulk of bigger machines. The overall styling is pretty much the same as the rest of the '79 range, removing it one stage further from the earlier 550s. Around the bike there are still more detail changes, making it quite obvious that the 650 is much more than a big-bore 550.

Alloy-spoked Comstar wheels set the bike off, the distinctive lines





Top: the 650 motor is based on the 550-four but has been developed to give a power increase all through the range.

Bottom: twin-disc brake gives plenty of power and reasonable wet performance.

Honda CB650

of the seat and tank blending like a one-piece unit with the side covers. The handlebars are flat and the footrests set back close to the swing-arm spindle — far enough back to need a remote gearshift linkage. It leads to a riding position which works well, putting the rider's legs back where they automatically take up sudden road shocks. There is also enough forward lean to balance wind pressure without putting so much weight on the wrists that traffic-riding gets uncomfortable. The gear linkage has the added advantage that it gives much finer adjustment than the usual splined lever, although the scope was limited by the exhaust immediately below the pedal.

Overall the 650 was a very comfortable machine to ride, my only criticism being that the footrests were too low. Alternatively, the seat might have been too high — ironically Honda's blurb mentions the "low" seat height which is fractionally lower than the 550s. By their own figures, this is 31 inches which doesn't exactly rate the "low" description.

I'm convinced that the natural riding position helps the general control, as well as the comfort, of the machine. Whatever the reason, the 650 was particularly easy to use and not so tiring as earlier bikes, especially on long runs or in difficult conditions Honda did some good work when they redesigned their dampers and now have units which give a superb compromise between comfort at road speeds and stability when you push the bike hard.

Most of my riding was done in conditions which made these qualities of comfort and control more important than usual. The Honda suffered rain, freezing fog, ice and finally snow during its three week test period. I'd had to cover four 100-mile journeys in this sort of weather and, despite numb fingers and the general nuisance level of the slippery roads, I was amazed that the 650 was still so easy to handle.

It responded so positively to minor corrections that there was no need to be ultra-delicate with the controls. It seemed that the Honda would only slip and slide if the rider was abnormally clumsy or hit the throttle or brakes deliberately hard enough to put the wheels out of line.

Finally, with the roads covered in hard-packed snow and frozen ruts left by other traffic, I toyed with the idea of fetching my trail bike from the test house and abandoning the 650. But natural lethargy overcame the prospect of putting the 175 back together again and I attempted the homeward journey on the Honda. The hard snow was fairly grippy and, along the straights, it was safe enough to work the bike up to 40 or 50 mph. The only problem then was in being able to stop or to get round corners where the snow had been chewed up and had frozen over . . . and this really restricted safe cruising to about 30 mph.

Even at such a low speed the Honda would work happily in third, fourth and fifth gears, giving enough throttle response to be controllable although the revs often dropped well below 2,000. Ridden this way the bike was stable — I had to put a foot out twice in fifteen miles and one of those occasions was a false alarm. The back wheel would spin easily enough, but it broke away gently and needed a sudden or deliberate burst of power to make the wheel step out sideways. If a lightweight had such easy manners it would be praiseworthy — for a fully-equipped 650 roadster it seemed a highly improbable performance.

The weather only gave the Honda one problem. Continual running in the wet, with road salt sprayed everywhere eventually caused one of the HT leads to short out. The spark could be seen arcing from the plug cap across to the head fins. Cleaning the leads and then treating them with silicon spray only cured the problem temporarily. The odd thing was that the 650 ran quite happily on three cylinders — normally it is pretty obvious when one plug goes out but the only symptoms on the Honda were a slight loss of power and one cold exhaust pipe. There was no uneven running or abnormal noise, the bike merely needed a bit more throttle to keep up speed and the first time it happened it took me several minutes to realise where the fault was.

The weather conditions were so bad during the test period that we weren't able to run the Honda at the track. Or rather, we

did two laps and discovered that the icy patches were like riding over a quick succession of wet manhole covers. Consequently we only have engine performance figures and no speed or braking figures for the complete machine.

But if you had to ride a bike at all in such unpleasant conditions, the 650 proved to be a good choice. It is comfortable, although not quite as good as the CX500, and the controls in general make for easy, safe riding. The twistgrip has a light action but there is still too much travel to get full power with one flick of the wrist. The indicators have a larger switch, which makes it easier to find and the action of the clutch and front brake is very light. The gearshift is slicker than the fairly slow change associated with most Hondas — possibly this was helped by being able to adjust the lever to suit the rider, although the odd gear would still drop out if it weren't engaged deiberately and positively.

In poor weather you tend to notice these little details all the more — in some cases they take on a new importance of their own. With night falling in the middle of the afternoon and road conditions varying every mile of the way, the quality of the lighting can be critical. The 650 excels, from the positive switches to the powerful 55/60W headlamp. Main beam is as good as you'd expect with that level of power and most recent bikes have few problems in this area. It is the dipped beam which makes the 650 different and gives it probably the best original lighting which I've used.

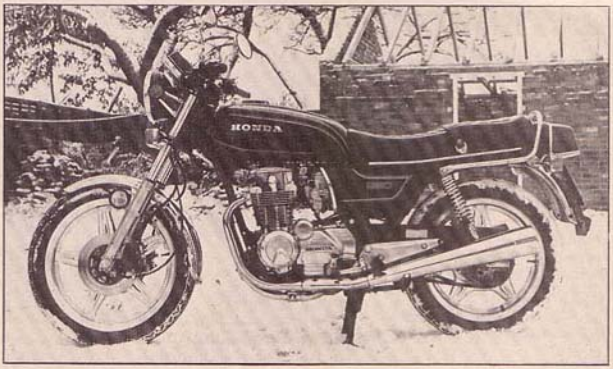
Like the Cibié units, it has an asymmetric cut-off. It throws out a bright pool of light angled high enough to let you see plenty of road surface but not so high as to annoy oncoming traffic. Towards the left of the road the light isn't chopped off, sending a powerful beam down the nearside gutter and verge, providing good visibility right where it is needed. Instead of plunging into uncertain darkness or backing off in the face of glaring headlights, it was safe to keep up speed on the 650, a is quite a rarity in original lighting equipment.

The tubeless Bridgestone tyres also played an important part in the Honda's sure-footed handling. They tended to track along grooves in the road surface, making the bike twitch if it crossed a line at a shallow angle but otherwise they stuck to the surface whether it was wet or dry, putting a nice finishing touch to the bike's confident handling. Braking was equally controllable, the power of the twin disc seemed well up to the job, although most of the time the road conditions weren't exactly conducive to heavy braking. Rain and road spray caused a loss of power at the discs which needed a careful increase in lever pressure before the pads would bite through the water.

The rear drum brake wasn't affected and was a lot less powerful anyway, making a useful back-up brake when the roads were slippery. It could be improved, though. The rod-operated linkage made it feel rather spongey in operation, as if the rod were flexing. The pedal could also have been tucked in closer to the engine casings, where it would be less obtrusive when it wasn't needed.

The changes in chassis design between this 650 and the earlier 550 don't seem to be very radical — an inch added to the wheelbase, the steerng head raked out by 1.5 degrees and new dampers. Yet they make a difference. The 550 had light handling and fairly light, rapid steering to go with it. The 650 feels much firmer, the bars refuse to twitch or wobble and the suspension has the rare ability to combine steadiness at high speed with the capacity to soak up large bumps at low speed. The 550's tail would go light and, under heavy braking, would float around. The 650 is much steadier. Although we didn't get the chance to test the bike's high-speed handling, if it is as good as other new Hondas there will be little to criticise.

While the weather restricted track testing and cut short any evaluation of the machine's top performance, it also highlighted many values which can be just as important. Flexibility became essential on several occasions, and the Honda delivered the goods. On the few dry days, the engine also showed itself to be quite lively. High speed cruising left plenty of power in reserve for rapid overtaking and the performance was there instantly, it didn't have to be sought out. On longer runs, sticking to legal limits, I noticed that the bike was keeping up respectably high average speeds. For touring, in particular, it is quite useful to have a machine which will cruise at 70mph and still *average* 60 mph. It was this aspect, rather than all-out performance, which made BMWs so attractive for long-distance runs.



Top: latest styling gives a comfortable riding position combined with a decent tank size.

Centre: uncluttered control arrangement with choke and fuse box mounted above the handlebars.

Bottom: Rearset rests have a rose-jointed and quickly-adjustable gear linkage.

Performance & specification

ENGINE

SOHC in-line four, electronic ignition, four 26mm Keihin carburetters, wet sump lubrication, 12V lighting, 12 ah battery.

displacement 626ccm
bore x stroke ..... 59.8 x 55.8mm
compression ratio 9.0:1
claimed output ..... 59bhp at 9000rpm
11.2lb-ft at 8000rpm

TRANSMISSION

HyVo chain drive to countershaft, gear drive to clutch and five speed gearbox. Final drive by chain.

primary reduction 2.737
final reduction 2.50 (16/40)
gearbox ratios: 2.500; 1.722; 1.333; 1.074 and 0.885

CHASSIS

front tyre 3.25H19
rear tyre 3.75H18
wheelbase 56.3in
castor 62.5deg
trail 4in
overall length 86.6in
overall width 30.5in
dry weight 436lb
fuel tank capacity 4gal
oil capacity ..... 6.2 pint

PERFORMANCE

no figures available because of weather conditions at track.

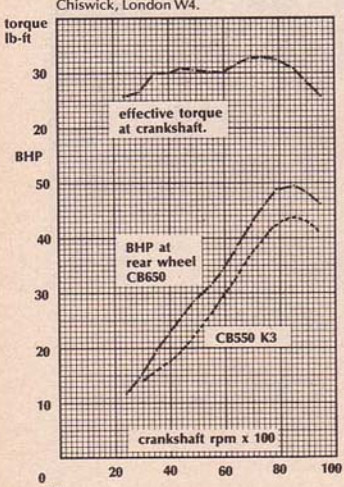
FUEL CONSUMPTION

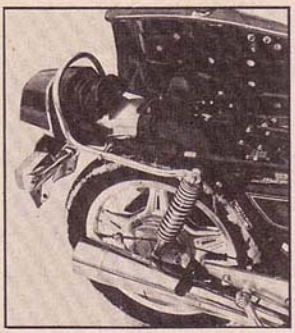
worst 48mpg
best 58mpg
average 54mpg
range to reserve ..... 154-185 miles

LIST PRICE inc VAT and delivery £1491.

warranty: 12 months' unlimited mileage.

importer: Honda UK, Power Road, Chiswick, London W4.





Compartment in the seat tail is only big enough for the toolkit.

Honda CB650

The 650 fired up fairly easily, considering the sub-zero conditions which constituted most of its cold-starts. Usually it picked up quickly on one cylinder and then struggled on for a few more seconds until the others chimed in. Like earlier four-cylinder Hondas, it took a long time to warm up. Even after the engine had been run for a few minutes, possibly travelling a mile or so, it still needed a burst on the starter jets to pull away from low speed, after slowing down for a road junction, for instance. Honda's practice of mounting the starter-jet control on the fork yoke took any inconvenience out of this although the long warm-up period meant there was a tendency to forget that the control was still half-out.

Fuel consumption was fairly typical for a large-ish roadster, fluctuating between the high 40s and perhaps 60 mpg. No doubt if we'd been able to give it a good belting around a track it would have dropped (risen?) to something like 30 mpg, the same as all the other machines in this class. One advantage of the 650 is that its four gallon tank gives a sensible range. I think most people who want this kind of machine don't expect amazing fuel economy but they also don't expect to re-fuel every hundred miles.

This, like handling properties, is something the Japanese seem to have neglected until quite recently. Now that they've finally woken up to the fact that it is useful and may therefore help to sell more bikes, they've done something about it. In the case of the Honda, this amounts to a range of 160-175 miles from full to reserve, with some three-quarters of a gallon still left in the tank.

The engine itself is quite obviously based on the 550, but it comes from a refined series of modifications and a lot of development work. There was no question of just sticking bigger pistons into an existing engine, the whole thing has been reworked in order to get the full benefit. Their intention is equally obvious — to get more power and performance, probably at minimal cost, without losing any of the 550's agility and versatility. The new motor gives a (measured) ten per cent increase in power all the way from 4000rpm up to 9500 and the shapes of the bhp and torque curves confirm that a lot of development work went into the design.

What they have done is to take the bores out by 1.3mm but, probably, because the 550 was already a long way over-square, the engine is also stroked by an extra 5.2mm. The resulting 59.8 x 55.8mm configuration gives a displacement of 626cc.

To push the power peak back up into the higher rev regions demands more breathing capacity; the carbs have grown from 22mm to 26mm and bigger valves are used, presumably with cam profiles to match. These, and the new four-into-two exhaust, are the essential changes — the compression ratio remains the same — and apart from detail design this is all that distinguishes the 650 from the 550. That much is borne out by the weights of the two machines, at 198kg dry the 650 is 6kg heavier than its predecessor.

The bottom half of the engine follows conventional Honda practice. The shell-bearing crank drives a countershaft by HyVo chain which has the added refinement of a tensioner operated by oil pressure.

While Honda claim 59bhp at 9000rpm, we measured just over 49bhp at 8500 at the back wheel and this compares to 43-44bhp for the CB550, run on the same dyno. The power level we saw is marginally below that of the 650 Kawasaki but the Honda was run with only 800 miles on its speedo. We've found with other four-cylinder engines that mechanical losses decrease with further bedding in and, after a couple of thousand miles there can be a five per cent increase in power. This would give the Honda the same output as the Kawasaki and I would guess that the road performance of the two machines would be just as close.

Honda claim a top speed of 119mph and 400m acceleration times of 12.7s, which seem slightly optimistic. Judging from the horse-power and road performance of other machines, we'd say that 50bhp is good for 115-117mph, and less if the bike is overgeared. The CB650 was, in fact, geared for 120mph or a shade less so it would probably get to pull peak revs in top.

In many ways the whole machine could be taken as a compliment to road tests — nearly everything we've bitched about in the past has been modified. The ten per cent power increase has been matched by improvements to the chassis and cycle parts. The bike has been updated so effectively that it is easier to think of it as a new model and not a refinement of a previous machine.

The 550 was undeniably a good bike; the conversion to a 650 doesn't take away any of the old model's desirable qualities but it does add a character all of its own. My only reservation comes when I step away from the CB650 and try to fit it into an overall picture; with little to fault the 650, I still prefer the CX500 or, in a quest for more performance, would turn to one of the 750s (including Honda's own four-valve model). There is no particular advantage in having a 650, as opposed to a 500 or a 750 . . . but, perhaps, we should just be grateful that we have the choice.

John Robinson