
HONDA
DUNLOP
QUALIFIER

HONDA CB900C

"Oh, do not ask, 'What is it?'
Let us go and make our visit."—T.S. Eliot

● HONDA'S CB900 CUSTOM IS A BIT OF AN enigma, to us and perhaps even to its creators. According to our sources at American Honda, the 900 wasn't intended for the touring rider, yet it definitely has some of a touring bike's attributes. Neither is it a road-sport model, though it was directly derived from one of the most sporting motorcycles Honda has ever made for sale to the public. And despite having officially been designated a "custom," the CB900 isn't quite that, either. The only thing it clearly is, is a marketplace competitor for the Suzuki GS850 and Yamaha XS850; on that basis shall it be judged, by us and everyone.

The CB900 has an interesting lineage. It was initially a bored and stroked version of the 16-valve CB750F, made for the European market and introduced there last year. Honda opened the 750's bores from 62 to 64.5 millimeters, stretched its stroke (also 62mm) to 69mm, and thus increased its displacement to 902 cubic centimeters. They made the stroker crank's webs thicker, lengthened the block and rods, upped the intake and exhaust valve diameters by 1.0 and 0.5mm, respectively, and added five degrees of duration at the cam lobes' opening sides. There were other performance-related changes as well, because what Honda wanted (and by all accounts succeeded in making) was a super-sport motorcycle capable of holding its own on Europe's no-speed-limit highways. To that end, they even gave the European CB900 an oil cooler as standard equipment'. . . an item not usually necessary in America, where the law's admonition to "cool it" tends also to keep oil temperatures low.

We'll admit that we'd have been well pleased if Honda had decided to fit the European CB900 with DOT lighting, EPA carburetion, and sent it here without making another change. That was not to be. Europe's CB900s are chain driven, and Honda wanted a shaft-drive model to slip into the broad product gap between the GL1100 and CX500 shafties. The bike got its drive shaft, along with many added pounds and a greatly lengthened wheelbase. So, to borrow from the beer commercial, the Americanized CB900 gives you more, and less: more civility, less performance.

Honda's American CB900 would not be so long of wheelbase, nor mechanically quite so interesting, if those who designed it had not chosen to use a maximum of existing hardware. Specifically, they opted to work with only lightly altered CB900 *née* CB750F engine/transmission cases and the GL1100-CX500 final-drive assembly. This approach, like making the CB900 out of the CB750F, was shaped by manufacturing economics. They had to couple a left-side transmission output stub to a right-side final drive, and the twain could not be made to meet without taking complicated measures.

What Honda's engineers did to resolve their right-to-left dilemma was to cobble together some transfer gears, a jackshaft and right-angle bevel drive in a housing that wraps around the left side and rear of the main transmission case but is not inseparably a part of it. They also doubled-up the transfer gears, which occupy space originally taken by a sprocket, and added a shifting dog, etc., to give the CB900 a two-speed secondary transmission. And although the entire exercise was prompted by cost considerations they did not stint in building reliability into their cross-over drive unit. It is a very strongly constructed piece of equipment, with its own oil supply and a small trochoidal pump to keep its bevel gears lubricated; splash oiling takes care of the transfer gears.

There certainly was some justification for the two-speed feature of the drive. Gold Wing owners never have been able to agree on the overall gearing their bikes should have: some want the ratio "tall," for low-stress cruising; others, habituated to hauling big loads and pushing bulky fairings, prefer the shorter gearing that lets them pull steep grades without downshifting. The CB900's Select Range feature provides two overall ratios. There's a 5.26:1 ratio (in fifth gear) for mountain or urban conditions, and a 4.50:1 ratio for economical cruising.

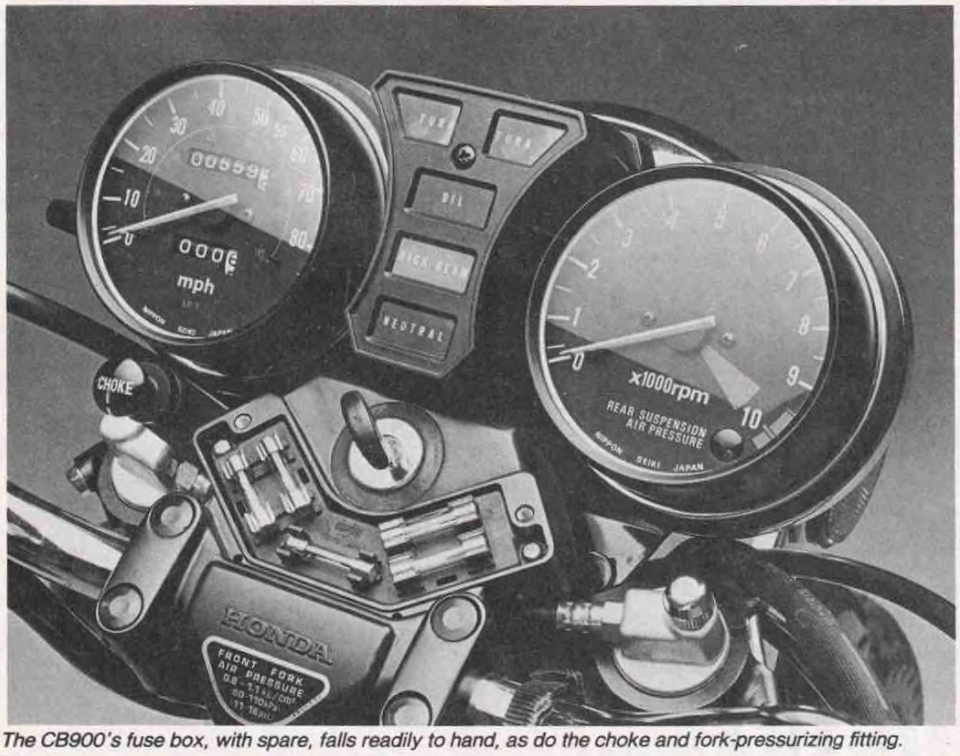
You can get economy, both in fuel mileage and engine life, by using the Select Range's high gear for cruising. In fifth/low the CB900's engine spins 4378 rpm at 60 mph; in fifth/high it turns only 3745 rpm, and feels like it's idling. There's a dramatic difference in fuel economy, too, which hints that the power engines need merely to overcome their own friction is significant. We rode the CB900 on a long loop around this area's freeways, first in fifth/low and then in fifth/high. Low-range riding returned 41.8 mpg; in high the mileage rose to 48.6 mpg. Using low-range for a period of maximum-effort performance and handling testing brought the CB900's mileage down to 28.5 mpg, and the overall average for the entire test was 37.2 mpg. That fuel consumption rate would give the Honda 164 miles before its 4.4-gallon tank empties, but running at a

PHOTOGRAPHY: DAVE HAWKINS, ROBIN RIGGS

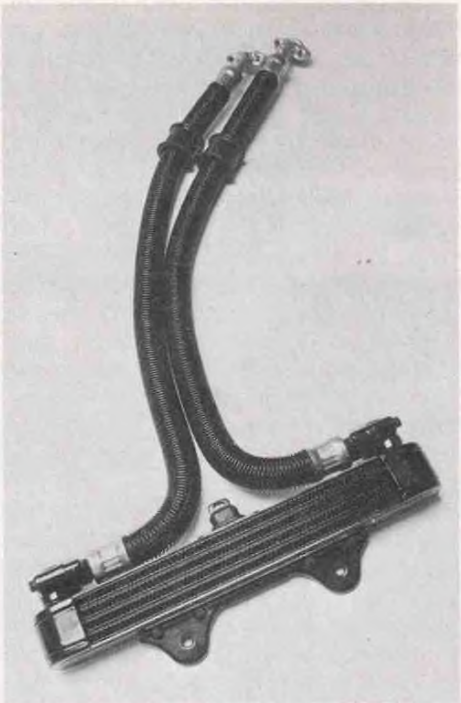
HONDA CB900C TEST

steady 60 mph would stretch the range to 184 miles if you keep it in granny, or 214 miles if you use the overdrive.

Whatever drive ratio you select, it's a long path for power to get from the CB900's crank to its rear wheel. A broad Hy-Vo chain links the crank with a jackshaft, which has a vane-type rubber-loaded drive cushion at its center and spur gears at each of its ends. The left-side gear drives the engine's oil pump; the one on the right meshes with a pair of gears on the clutch basket. Only one of the clutch-basket gears actually participates in the drive; its mate, also straight-cut but much narrower, has one fewer teeth than the driven pinion and therefore rotates slightly faster. This causes a scrubbing drag between the two gears that takes up lash in their meshing with the jackshaft pinion, which keeps this part of the drive train from rattling.



The CB900's fuse box, with spare, falls readily to hand, as do the choke and fork-pressurizing fitting.



This oil cooler is a necessity in Europe, but just a bonus feature here in speed-limited 1980 America.

Interesting lineage: Honda's 16-valve CB750F, made for America, begat the European CB900, which begat the shaft-drive American CB900 Custom seen here.

After passing through the clutch, the drive goes through a conventional constant-mesh five-speed transmission—hopping across from input to output shafts, and then to the secondary transmission's gears, shafts and bevels before being sent back to yet another pair of gears at the rear axle. There are, in all, 20 gears, six shafts, a dozen bearings, three torque cushions, a U-joint and assorted couplings employed in making the crank/rear-wheel connection.

Something in the above train puts too much lash in the CB900's drive. Our prime suspect is the cam-type drive cushion that's incorporated in the crossover unit's jackshaft. Whatever the source of the lash it's there and it's bothersome, especially in first and second gears. Going too quickly from closed to open throttle, or vice versa, gets you yanks and lurches the like of which you won't find in any other motorcycle presently in production.

A portion of the on/off-throttle lurching may be contributed by the 32mm CV-type Keihin carburetors. These get off-idle help from an accelerator pump, which discharges into all four throats, but there still is a slight hestitation in the low-speed throttle response to aggravate the effects of drive-train lash. That's the only carburetion flaw. EPA-dictated jetting has made the mixture lean enough so that a bit of choking is needed for starting if the engine is just cool, not cold, but you won't have to use the choke for more than a minute even in the morning chill. The CB900 isn't as cold-blooded as many of the pre-EPA Hondas.

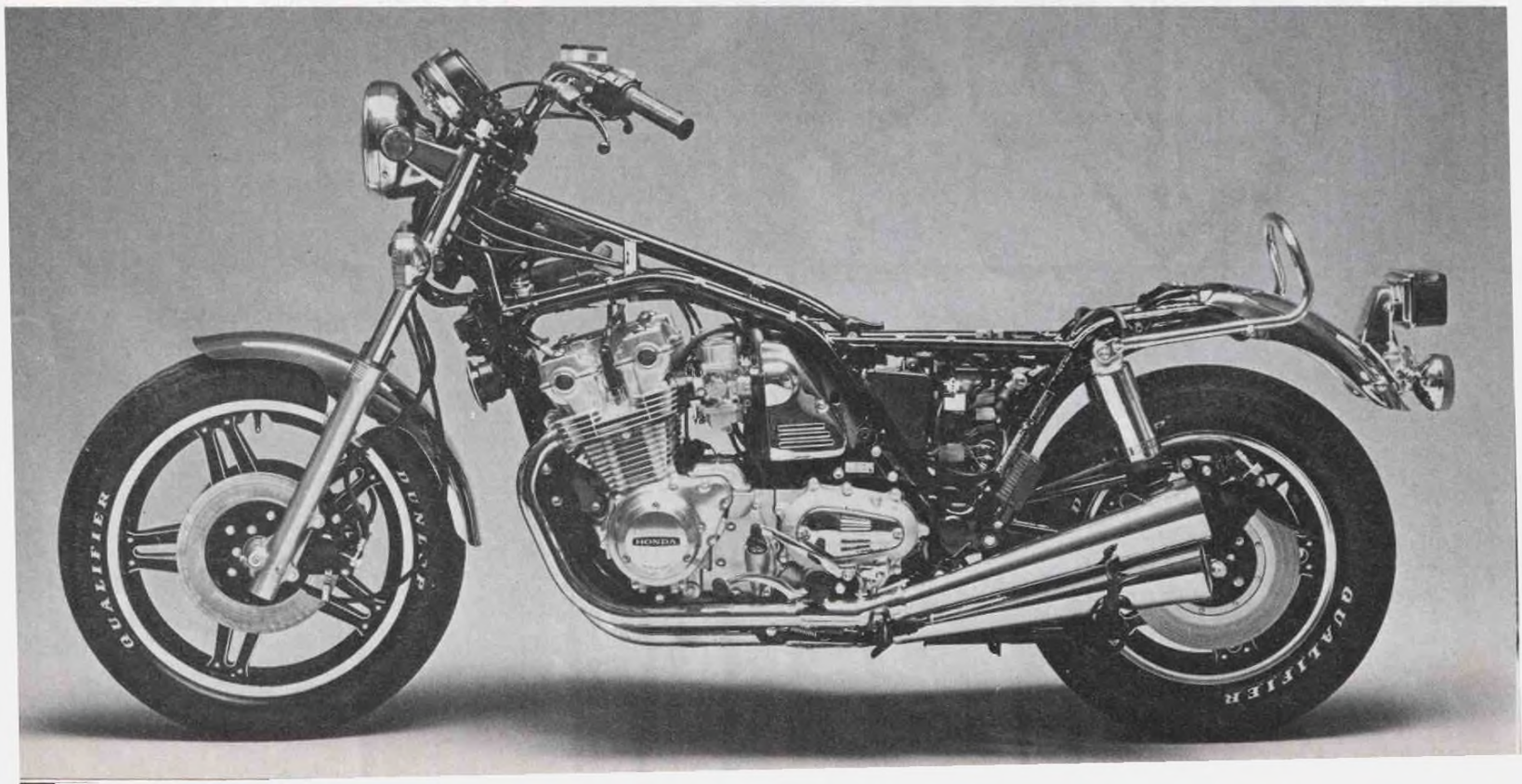
In most ways the CB900's engine is a pure pleasure, whether it's touring, drive-in visiting or home/work commuting you've asked it to do. It has the general power-delivery characteristics of an electric motor, with its torque seemingly independent of tachometer readings. There isn't the top-end power you'd expect from an engine with so many valves and long-duration cams, and this makes the CB900's real-world performance better than its drag-strip numbers suggest. Our best quarter-mile run was in 12.76 seconds, at 104.89 mph, which is two-tenths of a second slower than the best time turned by Honda's spirited CB750F. But the CB900, running with its Select Range box in low, will fifth-gear accelerate very briskly and even at the drag strip—where it isn't at its best—it's both quicker and faster than the Suzuki GS850 or Yamaha XS850. The CB900 is 0.21 second quicker than the GS850, with an essentially identical speed; it totally out-performs the 13.26-second, 101.46-mph Yamaha triple.

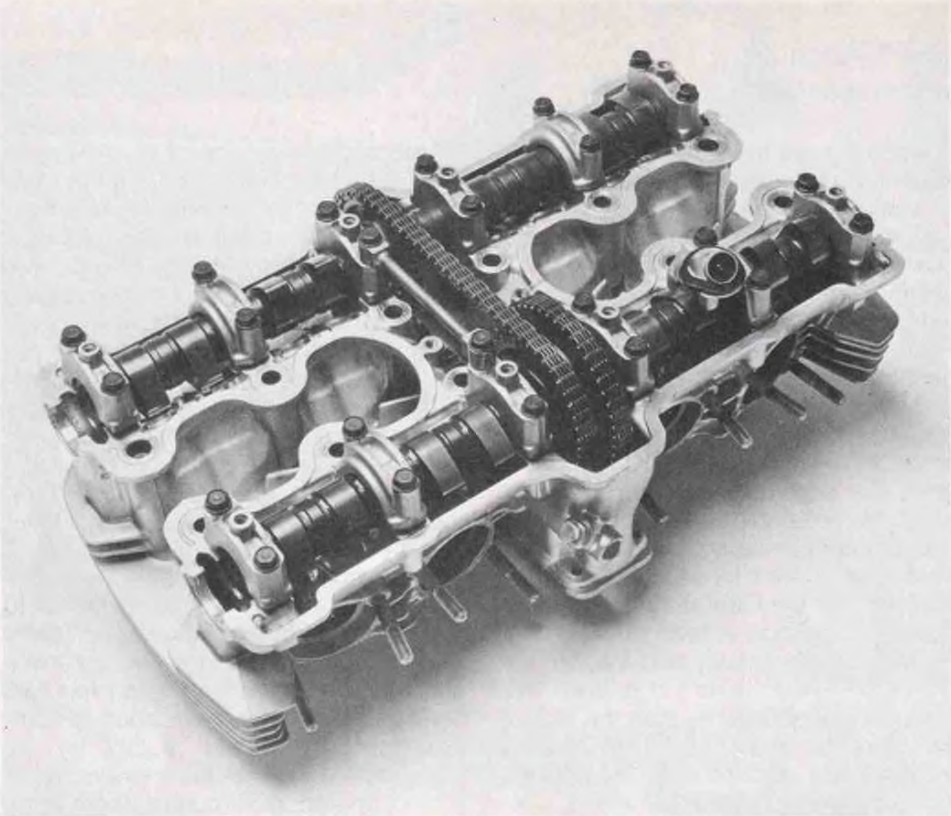
Nothing else in the CB900's class, and few outside it, can equal its ride quality. The bike doesn't quite have enough rear-wheel travel to cope with its weight, and bottoming can occur under certain conditions, but the new leading-axle fork is wonderfully compliant and if you adjust the suspensions full-soft you'll feel like you're riding on air—which is exactly the case. Honda has given the CB900 steel springs, but they're there just to keep its suspensions from collapsing completely against their stops in the event that air pressure should be lost.

Honda's first version of the American CB900 had a center-axle front fork; this new one, a 1981 model, has similar 37mm fork tubes but leading-axle sliders. We don't know why the change was made. The new fork's tubes are angled back a little in their triple-clamps to place the axle right where it was before, so there's no appreciable alteration in steering geometry. And the below-axle portions of the new sliders are hollow, mere adornments promising but not delivering extra travel and/or slider overlap. In fact, the 6.1 inches of fork travel is just what it was before. Apparently, all the fork's changes are for styling.

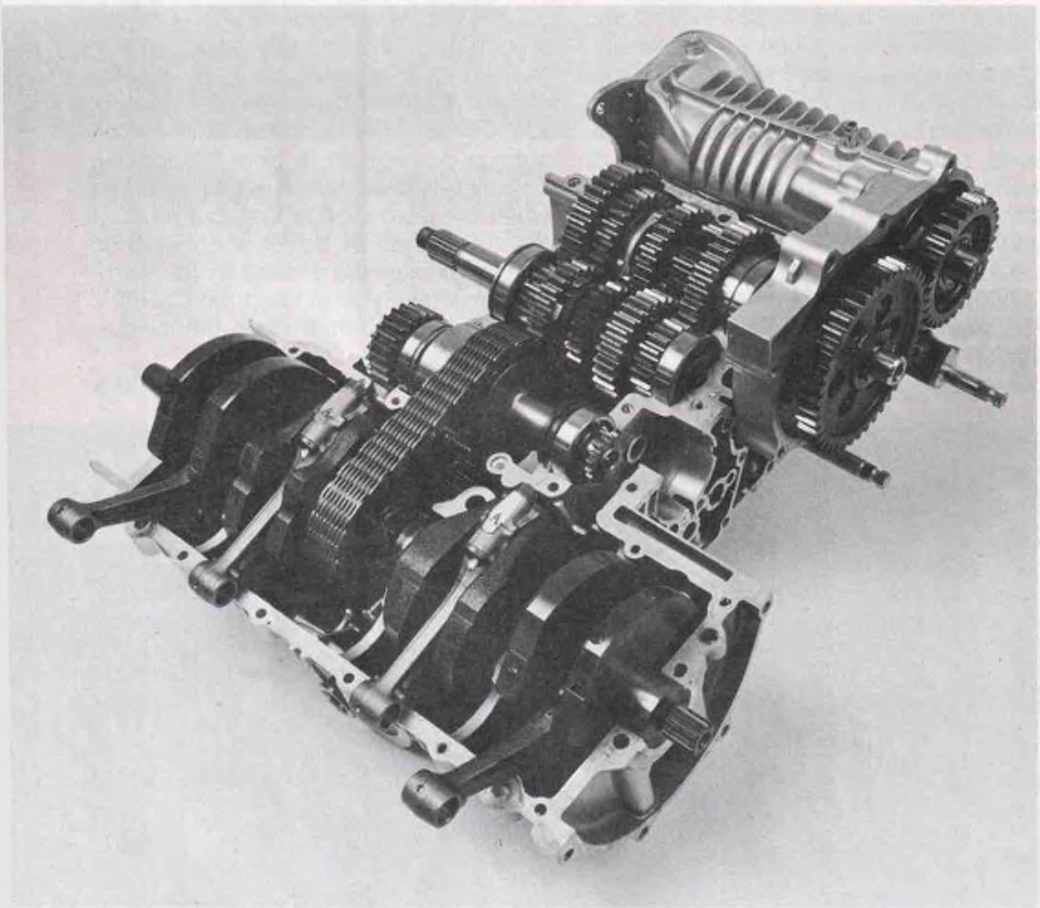
Although closely similar to the Gold Wings', the CB900's shocks are different parts. In design, these units are not unlike short, inverted fork legs. Each has two coil springs, but their resistance to compression is supplied mostly by air pumped into the shock's interiors. Air is added, or bled off, through a single fitting located behind the bike's left sidecover. Honda recommends pressurizing the shocks to between 28 and 64 pounds per square inch, and has provided a sensor that lights a warning lamp on the tachometer face if the pressure drops below 20 psi. The shocks' internal coil springs do keep them from telescoping completely down against their stops when pressurization is lost, but most of the 3.8 inches of travel is gone when they're airless, and a decal by the warning lamp tells you to keep the CB900's speed below 50 mph when the lamp is glowing red.

Honda's recommendation for fork





A long Hy-Vo chain connects the CB900's crank and exhaust cam; a shorter one links the two cams together.



A crankshaft much like the CB750's, but with heavier webs and counterweights and more crankpin offset.

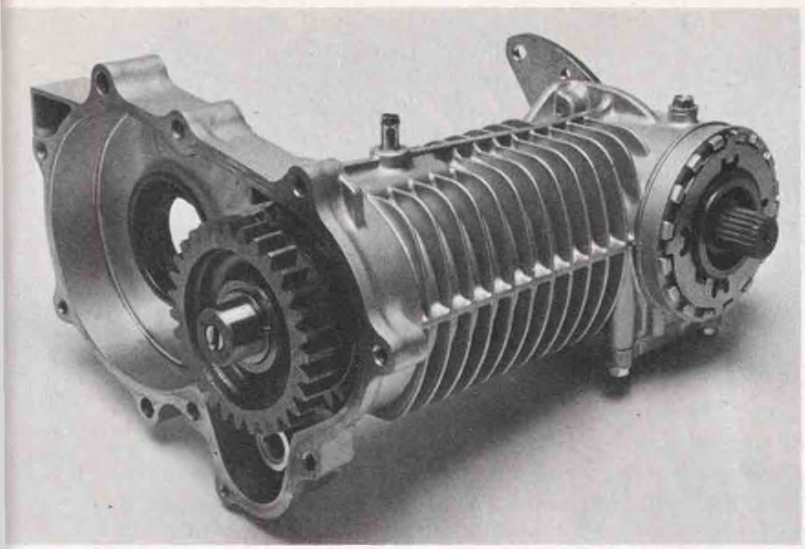
pressure is 11 to 16 psi. You can get close to the ultimate in floaty rides by running minimum pressures, front and rear; that's not what we'd suggest. After some experimentation we settled on 45 psi as the best rear shock pressure for all-conditions solo riding, and we used 14 psi in the fork. At that pressure the CB900's stiction-free fork responds with near-total compliance to small ripples and highway expansion seams, yet it stiffens enough in the second half of its travel to keep braking nose-dive from upsetting stability. Higher pressures may be needed to adjust for "full-dress" loads, but when riding solo they make the ride slightly stiff without yielding any payoff in improved handling.

Most riders will judge the CB900's steering and overall road manners satisfactory. It's straight-line stable at normal and reasonably fast cruising speeds, though traces of wobble begin to appear as the speedometer needle approaches the instrument's DOT-mandated, 85-mph limit peg. You will need to apply some muscle at the bike's handlebar to whip it through fast esses quickly, but the steering is nicely neutral so you don't have to fight to hold a line once you've stuffed the CB900 into a corner. Few people will want to do much corner-stuffing with this Honda: it weighs too much (610 pounds) and is too bulky for such games, and would be a handful even if it had firmer suspension damping and more cornering clearance.

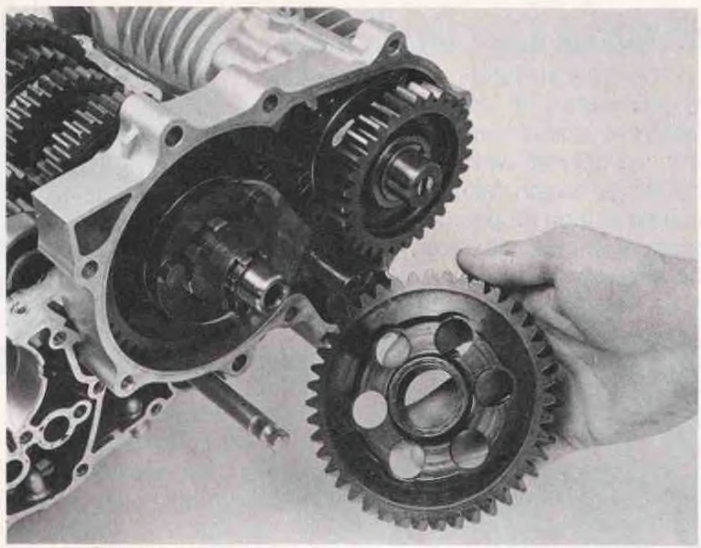
For sheer wheelbase, Honda's CB900 is one of the giants of our time—being only 0.3 inch shorter than the Harley-Davidson FXE "Fat Bob" Super Glide. Honda needed wheelbase to make room for an absolutely enormous engine bay; they devoted remarkably little of the space to the CB900's swing arm, which is too short to subdue the shaft drive's torque jacking effects. The Yamaha XS850 and Suzuki's GS850 are also shaft-driven motorcycles, and the latter is only five pounds lighter than the CB900. Both handle better and neither has the Honda's habit of lifting and falling when its throttle is opened and closed.

One genuine improvement Honda made in the CB900 for 1981 was in its tires. These are the same sizes as before—a 110/90-19 up front and a 130/90-16 at the rear. Both tires are H-rated, as before, but they're now tubeless, which we consider a step forward. Two kinds of tires will be fitted on 1981 CB900s: Dunlop Qualifier, and Bridge-

What price reliability? Honda cobbled together eight gears, three shafts, a U-joint, an extra torque cushion and many seals and bearings just to replace a length of chain.



The cross-over drive unit has its own oil supply, and an oil-distribution pump.



Honda installed two sets of transfer gears, and gained Select Range.

stone Mag Mopus. Our test bike had the Dunlops, which provided adequate dry-road traction and a smooth ride, along with a couple of minor problems. The rear tire has rather tall, straight sidewalls and these flex sideways enough to be felt as a squirming at the Honda's rear when it is worked hard in fast turns. Also, California's infamous freeway rain-grooves caused the semi-ribbed front tire to weave slightly, though not enough to be worrisome.

Motorcycles with the Honda's weight and capacity for sprinting rapidly between corners give their brakes a serious workout. Not all of them have brakes that hold up as well under the strain as the CB900's. Its three disc rotors turned faintly straw-colored from the temperatures reached during one long session of mountaineering, and even that wasn't enough to destroy their effectiveness. Heat made the brake pads literally smoke; it didn't glaze them or warp the stainless steel rotors, and the brakes continued to do their job. The only ill-effects noted during this phase of our test-

ing were an elevation of lever-pressure requirement with extremely high temperatures and a deterioration of brake feel. At normal working temperatures there's a linear relationship between squeezing and stopping; when the pads begin to smoke the lever feels spongy, the braking is weak at moderately hard lever pressures, and tends to shudder and grab if you attempt a maximum-effort stop. The rear brake neither fades nor loses its feel, but then it isn't worked nearly as hard as the dual-disc unit on the front wheel.

The CB900's split-level seat has been upgraded for 1981 . . . or so it is said. There's supposed to be thicker padding under the seat's forward half, and a reshaped step, but the differences are too slight to be noticeable. No matter: the Honda is perfectly comfortable to ride, for as long as you can stand being in the one position it allows you to assume. The seat is low (only 30.8 inches from the ground) and that makes the reach to the pegs a tad short for long-legged riders, but the handlebar-grip placement is exactly right and the tapered tank has been shaped by someone who paid attention to the inner contours of human knees and thighs. The only thing wrong with the CB900's seating position is that it's rigidly enforced; the seat locks you in place, and however well you like it for 15 minutes you'll wish you could move around

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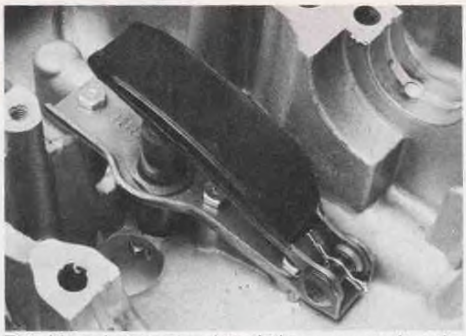
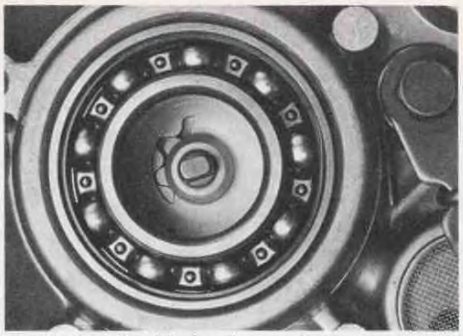


This hinged, neoprene-faced shoe runs against the primary chain's slack side to prevent rattling.



The cross-over drive's oil pump is hidden away in the center of the cross shaft . . . a very clever touch.

Make and model ..... Honda CB900C
Price, suggested retail (as of 6/13/80) ..... N/A

PERFORMANCE
Standing start ¼-mile ..... 12.76 sec. @ 104.89 mph
Engine rpm @ 60 mph, top gear, low range 4378
high range 3745
Average fuel consumption rate ..... 37.2 mpg (15.8 km/l)
Cruising range, main/reserve ..... 133.9/29.8 mi. (214.9/47.4 km)
Load capacity (GVWR less curb weight) 208.6 kg (460 lbs.)
Maximum speed in gears @ engine redline,
low range ..... (1) 52.8 (2) 70.1 (3) 90.2 (4) 108.2 (5) 130.2 mph
high range ..... (1) 61.8 (2) 81.9 (3) 105.4 (4) 126.4 (5) 152.2 mph

ENGINE
Type ..... Four-stroke transverse four, air-cooled with dual chain-driven overhead camshafts and four valves per cylinder
Bore and stroke ..... 64.5 x 69.0mm (2.54 x 2.72 in.)
Piston displacement ..... 902cc (55.0 cu. in.)
Compression ratio 8.8:1
Carburetion ..... (4) Keihin 32mm constant-vacuum
Exhaust system ..... Four into four
Ignition.. Battery-powered inductive, magnetically triggered
Air filtration ..... Dry cartridge, disposable
Oil filtration ..... Paper element, disposable
Oil capacity (engine) ..... 4.5 liters (4.7 qts.)
Oil capacity (transfer case) ..... 0.6 liters (0.6 qts.)
Oil capacity (final drive) ..... 0.2 liters (0.2 qts.)

TRANSMISSION
Type ... Dual-range five-speed, constant-mesh, wet clutch
Primary drive .... Hy-Vo chain and straight-cut gear, 2.04:1
Secondary drive, low ..... Straight-cut gear, 0.72:1
high ..... Straight-cut gear, 0.62:1
Tertiary drive ..... Shaft and spiral-bevel gear, 1.20:1
Final drive ..... Shaft and spiral-bevel gear, 3.091:1
Gear ratios, overall, low range ..... (1) 12.96 (2) 9.77 (3) 7.59 (4) 6.33 (5) 5.26:1
high range ..... (1) 11.09 (2) 8.36 (3) 6.50 (4) 5.42 (5) 4.50:1

CHASSIS
Type ..... Twin front and rear downtube
Suspension, front ..... Coil/air-spring leading-axle fork with 154mm (6.1 in.) travel
rear ..... Swing arm with (2) coil/air-spring shocks and 95mm (3.8 in.) axle travel
Wheelbase ..... 1585mm (62.4 in.)
Rake/trail ..... 28.5°/114mm (4.5 in.)
Brake, front ..... Hydraulic, dual disc, 276mm (10.9 in.) rotors with single-piston calipers
rear ..... Hydraulic, single disc, 296mm (11.7 in.) rotor with single-piston caliper
Wheel, front ..... Composite, 2.15 x 19 in.
rear ..... Composite, 2.50 x 16 in.
Tire, front .. Tubeless 110/90-19 62H Dunlop Qualifier F11
rear ... Tubeless 130/90-16 67H Dunlop Qualifier 67H
Seat height ..... 782mm (30.8 in.)
Ground clearance ..... 160mm (6.3 in.)
Fuel capacity, main/reserve ..... 13.6/3.0 liters (3.6/0.8 gal.)
Curb weight, full tank ..... 276.4 kg (610 lbs.)
Test weight ..... 349.0 kg (770 lbs.)

ELECTRICAL
Power source ..... Three-phase A.C. generator, 266 watts
Charge control ..... Solid-state regulator
Headlight beams, high/low ..... 60/55 watts
Tail/stop lights ..... 8/23 watts
Battery 12V 14AH

INSTRUMENTS
Includes ..... Speedometer, odometer and resettable tripmeter, tachometer. Indicators for turn signals, low oil pressure, high beam, neutral, low shock absorber air pressure
Speedometer error, 30 mph indicated, actual 30.16
60 mph indicated, actual 61.09

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Honda CB900C *Continued from page 34*
some after an hour of riding.

You won't have the effects of engine vibration to massage your numbed backside. Honda has inserted rubber bushings in the CB900's engine mounts, and achieved a remarkable degree of smoothness at all speeds from just past idle to 6000 rpm. There isn't much engine vibration detectable at any speeds. You feel tremors at idle and a subdued buzz above 6000 rpm; that's all.

Honda hung a big outside-flywheel alternator on the CB900, giving the crankshaft some added inertia and providing an adequate power source for the bike's superb Stanley headlight. This quartz-halogen lamp draws 55 watts on low beam, 60 watts on high beam, and puts out enough light on either beam to crinkle the paint on stop-signs. For 1981, the electrical system also includes dual horns, which may not be mellow but most certainly are loud. Also new is the '81's instrument lighting: Honda has gone to shine-through illumination, with bulbs behind the instruments' faces. The markings glow in a pale green, highly readable yet restful to the eyes.

The CB900 comes about as near to being a service-free motorcycle as we are likely to see anytime soon. Its ignition system is pointless, its cam chain is automatically tensioned and its cooling sys-

(Continued on page 52)

Honda CB900C *Continued from page 37*

tem (plain fins) can never spring a leak. Keep an eye on the bike's three oil dipsticks—engine/transmission, Select Range transfer case, and final drive—and various air pressures, and you won't have much trouble. The infrequent post-warranty valve clearance adjustments should be made by an authorized Honda shop, which saves aggravation even if it costs money. You have to slide the battery sideways out of its mounting box to check electrolyte levels in the cells, but the retaining strap is held by a single capscrew so this chore is easily managed. And removing two screws (on the left-side airbox cover) will give you access to the air filter element. There isn't much you'd want to do, including removing the CB900's wheels, that can't be done using just the tools provided with the standard tool-roll. You even get an air gauge for checking the tire and suspension inflation pressures.

American Honda informs us that the 1981 CB900 Custom we tested will not be available at dealerships until early October, this year. They anticipate that the retail price of the "new" model will be approximately $150 to $200 more than the $3348 being asked for the 1980 Custom. That means it probably will be a price roughly $200 to $300 greater than you'd pay for a Suzuki GS850 or Yamaha XS850, which is a matter of greater import than whether you should buy the less-expensive 1980 CB900 or wait until the 1981 version is available. The differences between the 1980 and 1981 CB900s are mostly cosmetic; the extra money for the later model buys you tubeless tires, shine-through instruments, an extra horn and a "demand" automatic fuel petcock as functional hardware.

But there are large differences between the Honda CB900, Suzuki GS850 and Yamaha XS850. Go for the Yamaha and you get lightness and agility, with a suspension that is almost as compliant as the Honda's and much better controlled. The Yamaha also out-customs the CB900 Custom's looks, for whatever that's worth. The Suzuki GS850 is recommended by superb handling and what we consider supreme agreeability, with performance only fractionally inferior to the Honda's. With the Honda CB900 Custom you treat yourself to what probably is the best ride in motorcycling, strong straight-line performance, a look and quality of finish most people will admire, and maybe the most comfortable short-haul seating position ever provided between two wheels. If those are things you find most appealing, then the Honda CB900 Custom is the bike for you, whether you buy a 1980 model right now or wait for the 1981; whether it's better or worse in other ways than the Suzuki or Yamaha; and whether it is called a touring bike, a road-sport model, or a "custom." ◉