

## Range Rider

by Nicholas Crane

In a compact work-room beneath a studio cluttered with drawing boards, cycling literature and coffee mugs, lean a couple of bent and discarded bicycles—all that remains of “phase-one” in the development history of the Range Rider. Responsible for these wrecks is designer Geoff Apps. In the closing days of 1981, Range Rider “phase-two” arrived, and was deemed sufficiently innovative, topical and practical to be elected as one of the ICG’s Bikes of the Year. What we saw and tested was more of an advanced prototype than a final product, and at the time of writing the Range Rider is only available on a built-to-order basis.

For Apps the urge to take bicycles beyond the tarmac can be traced back to his teens; “rough-stuff” cycling is, after all,

nothing new and has long been enjoyed by many British cycle-tourists who take their road-bikes along the country’s un-made byways, away from the aggravation of motor vehicles. What is new though, is to take to rough-stuff on a machine built primarily for riding off-road and only secondarily for using on tarmac.

Such a machine needs outstanding traction, which means a very wide range of gears coupled with “grippy” tyres. It needs a high bottom-bracket to clear obstacles and has to have ample wheel-clearances to prevent build-up of mud. The riding position needs to be upright, to provide easy vision and handlebars need to be high and wide to permit positive steering. Fragile components need to be protected from knocks and the top tube should be

low enough to allow the rider to straddle the bike comfortably with both feet on the ground. The machine must also have effective all-weather brakes. Across the Atlantic, American off-roaders have evolved along different lines; they do not generally have to contend with the vagaries of a British climate—the mud, wet and slippery going. The Range Rider is not just an all-terrain machine, but all-weather too.

Test riding such an overtly *macho* machine proved something of a challenge and by the end of our exciting association with the Range Rider we had ridden it on every conceivable surface, from steep wet rock to level dry grass.

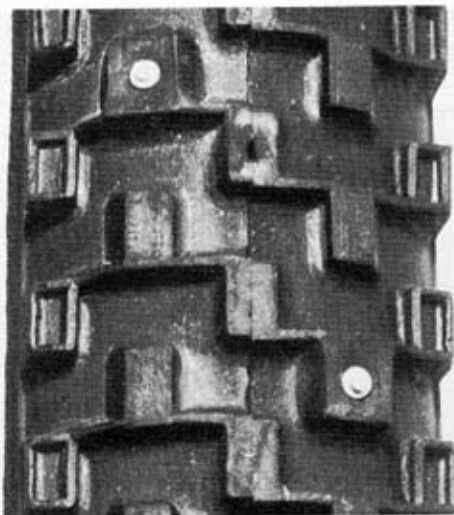
It's the performance of the Range Rider that strikes one first. The Hakkas' remarkable

grip on virtually any surface allows the bike to go places a normal machine just could not contemplate. A chunky tread curves a good way down the tyre's side-wall so that the bike can be leaned to unbelievable angles on corners and ridden on exceedingly steep cambers—useful when contouring a hill, for example. How much of this lateral grip is due to the tungsten studs—set at 6cm intervals around the sides of each tyre—is hard to say; the outer rubber treads are a hollow-block pattern and this undoubtedly helps. Climbing steep hills, the tread prevents the rear wheel from spinning and losing traction, provided the rider's weight is correctly balanced fore and aft, while on descents the sure grip contributes a great deal to the positive braking and steering. Although Apps recommends tyre pressures of

*The Range Rider: a gritty off-roader that will take you (almost) anywhere*



15–20 p.s.i. in the front and 20–30 p.s.i. in the rear we found that steeper uphill could be tackled by deflating the rear tyre until it almost runs on the rim. This gives an enormous “footprint” of  $9 \times 2$  inches together with a total of 6 tungsten studs in contact with the ground at any one time. The only drawback to running the Hakkas under-inflated is that they “creep” on the rim and need to be repositioned now and again. To optimise the



*A block tread on the Stud Hakkas provides extra traction and helps prevent lateral slipping; the tungsten steel studs are replaceable*

bike's performance it's important to alter the tyre pressures to suit terrain; we crammed in about 70 p.s.i. for riding on tarmac, to reduce the quite considerable rolling resistance. The studded Hakkas can tear up soil and vegetation and it is hoped that prospective owners will opt for the less expensive, all rubber, Speed Hakkas (same tyre, minus studs) for general use.

The front tyre on the test machine was smaller in diameter than the rear because the two-inch will not squeeze through the forks

fitted at present. This is somewhat unconventional but did not seem to affect handling adversely. (It is hoped to fit a wider fork-crown on future models.) Note that although both rims are for 26" tyres, the large section of the rear tyre increases total wheel diameter to 27".

The tyres are mounted on alloy Super Champion rims which have had their spoke-holes drilled out to accommodate the 12-gauge spokes. While doctoring the rims like this seems a risky business we were quite unable to crack, split or dent them—so it would appear that they have sufficient strength.

At the centre of each wheel is the component of which Apps is especially proud: the alloy hub-brakes. These mighty stoppers have cast and machined alloy shells, with hefty brake retaining arms and levers. The brake plate on each hub has a 4mm shroud which overlaps a lip on the hub shell; this effectively prevents grit from finding its way onto the brake pads, and while not being a completely watertight seal never allowed enough water to get into the brakes to impair their effectiveness.

The Range Rider's mudguards reflect App's flair for innovation. Starting life as full-length chromoplastic guards, they have been shortened and remounted, using extra-thick stays which pass over, rather than under, the guards, where they cannot form mud traps. Rubber grommets between the chromoplastic and stay bolts protect the guard from vibration and possible splitting. At present, Apps is unable to find guards wide enough to cover two-inch tyres so much does sneak past. They do, however, prevent the rider, gears and chain from being completely deluged in dirt.

You have to be tackling very rough terrain indeed before the chainrings and bottom bracket start to catch on obstacles, but Apps sees sharp bumps, rocks and logs as

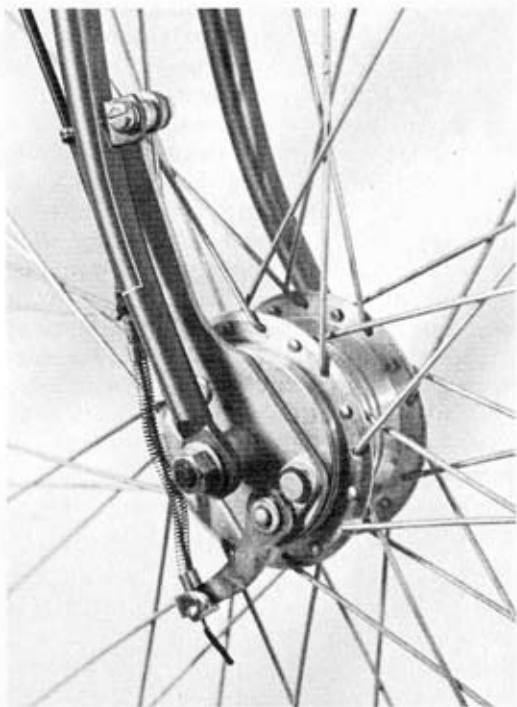
being legitimate targets for the Range Rider and has bolted a specially sculpted "bash plate" to the underside of the frame. In addition, the TA triple chainset has been cunningly modified to provide more protection still: removing all the teeth from the largest of the triple rings has left the inner two rings and chain safely sandwiched between the bash plate and modified outer ring. The latter also protects the rider's legs from being gouged by chainring teeth. Apps claims to have cycled over 20-inch logs.

To reduce the quantity of dirt thrown onto the chain by the back wheel, a thin aluminium cover is bolted just behind the chainset; this is only partially effective as it has only a 5mm clearance from the tyre and collects mounds of earth on its top edge, which then drop onto the chain! If the cover were slightly reshaped the problem would be solved.

The Range Rider's bottom gear of 21 inches sounds ludicrously impractical—at full revs it's hard to make walking pace—but it saves dismounting for short, sharp climbs. We took the Range Rider up Snowdon, a 3,000 foot peak in north Wales, to discover the bike's hill-climbing limits. For a mountain, Snowdon is not high, for a bike it is. Sections of the ascent are 1:2 and it was the 21-inch gear that got the bike up. For general rough riding, though, we liked to keep to the larger chainring. During our mountain test we managed to tear two teeth clean off the freewheel—an indication of the force that low gears, steep hills and powerful riding can exert. The Sun Tour Perfect freewheel has cut-outs in the larger sprockets to save weight but which would seem to limit overall strength too. Gear changing is handled adequately by the Sun Tour Cyclone front and GT rear derailleurs.

Both the Bullseye bottom-bracket and Sun Tour pedals are ideal choices. The Bullseye appears oblivious to complete immersion in water and can take severe shock-loading

without bearing failure; inside this most sophisticated of bottom brackets are two sets of needle roller bearings to cope with the vertical stress (the maker's claim two tons maximum!), and two additional sets of ball bearings to take lateral thrust. The bearings can be minutely adjusted, have integral seals and behave impeccably. The BMX-style



*Both front and rear brakes are the internal-expanding variety and are fitted with extra springs on the cables to aid lever-return*

pedals are similarly impressive in their construction, with finely-tuned, smooth-running adjustable bearings. They are double sided with ferocious teeth to give good purchase (toe-clips are not feasible for off-roading). When the pedal's outer plate gets bent, counter-sunk allen headed bolts release it for

reshaping or replacement. Hollow titanium spindles seem a bit extravagant but do seem difficult to bend.

Moving upwards we find a modified Blackburn front carrier fitted on the rear; this offers a platform for small panniers, topbag or saddlebag. Up front the high and wide handlebars and stump-neck stem (foam-padded) give an upright riding position. The bars were a little too wide though, catching on trees and hedges and being unmanoeuvrable in narrow defiles. The handlebar-mounted Sun Tour Mighty Shifter's are excellent—gears can be changed by the flick of a thumb, and without moving the hands from the bars. Like the handlebars, the dog-leg brake levers are motorcycle components, and provide immense leverage and deftly-controlled braking. While they did not snap, it would be prudent to fit thicker brake-cables which would be more compatible with the power of the levers. The only criticism in this department lays with the Grab-On handlebar grips

which soaked up water in the wet and slid off the bars.

The frame of the Range Rider we tested was built for a rider with a short inside-leg measurement, hence the quaint angle of the top tube. Although we were unsuccessful in attempts to bend the frame it would seem that there is a potential weak point in the seat tube where the top tube joins it. Much safer to have dropped the seat stays too, and used an extra-long seat pin, or extended seat tube. The twin-lateral tubes were added to help disperse stress from the top of the down tube. Fork rake, wheelbase and bottom bracket height felt ideal compromises for all terrains.

After the tests, when we came to dismantle and examine the Range Rider, the front axle was found to be bent; this was almost certainly caused by the combination of narrow hubs (cone-to-cone they are nearly an inch narrower than standard hubs) and the narrow fork crown, both of which conspire to excessively distance the wheel bearings from

*The TA triple chainset has all the teeth removed from its outer ring to provide a chainguard; a sturdy bash-plate is bolted to the underside of the Range Rider's frame*





*Taking it to the limit: the Range Rider is test-ridden to the 3,560-foot summit of Snowdon, in north Wales*

the fork drop-outs, putting too much stress on the axle by the bearings. The answer would seem to be a stronger axle, or wider hubs.

All brake and gear cables are fully enclosed to ensure that grit does not impair smooth running and are carried by many brazed-on eyes, all located beneath and behind the frame tubes where they will not catch flailing limbs. The frame is entirely lugless and builder Bill Witcomb has done a neat job with the fillets; paint is a subtle stone-grey with impeccable white box lining.

Accessories include a tough, compact (but expandable) Carradice pannier, pump, Blackburn bottle-cage and thermos (for really cold trips) and a tool kit. An allen-key clipped to the seat tube is handy for raising and lowering the saddle according to terrain but even handier would be a quick-release binder bolt. There is also a kickstand, but this seems a superfluous encumbrance. Elastic straps on the handlebars can be used to lock on the brake levers.

What is the verdict? It has to be one of enthusiastic acclaim, with some reservations regarding the necessary technical modifications. And the high price is a handicap,

though Apps hopes to bring this down as production gets under way (he also plans a low-cost version of the Range Rider—Land Rider—which should be more generally affordable). All who rode the Range Rider were thrilled by its performance. It has a genuine and unique off-road capability with the carrying capacity for lightweight tours. Along roads, compared to a conventional bike, it is plain hard work. On first acquaintance the Range Rider will perform astonishing feats and even with practice we found it hard to take it to its limits. Learning to body-lean when contouring, to avoid stones which might throw the steering on steep climbs, to ride raised and relaxed over large obstacles and to hit mire at top speed are all techniques that are only mastered the hard way.

Our Snowdon test illustrated the ideal qualities required for serious off-road riding: we took along a cyclist, a mountaineer and an ex-motorcycle-trials rider. The trials rider had the correct technique, the cyclist the stamina and the mountaineer, the power. You will be needing all these attributes before finding out just what the Range Rider *cannot* do.

#### **SPECIFICATION—RANGE RIDER**

**Frame:** Reynolds 531 tandem-gauge butted frame-tubes, butted steerer, plain-gauge head-tube and stays plus tapered twin-lateral strengthening tubes. Lugless construction. Campagnolo vertical drop-outs, derailleur hanger. Mudguard-stay brackets, carrier mounting eyes, brake retaining-arm bracket, bash-plate brackets and boss, chainset-protector bracket, brake and gear cable guides, bottle-cage bosses. 73° head angle, 74° seat angle, 41½-inch wheelbase.

**Sizes:** Test-model, 19½-inches.

**Forks:** Reynolds 531 taper-gauge blades, mudguard-stay brackets, brake retaining-arm bracket, 1½-inch rake. Campagnolo headset.

**Handlebars:** Wassel raised alloy bars, 72 cm wide,

with 18cm Grab On pads, screw-in end-plugs. SR alloy stem with 60mm extension, recessed allen-key bolts, Grab-On stem pad.

**Saddle:** Ideale Grand Tourisme, with coil springs and padded plastic cover on plastic base. SR Laprade alloy micro-adjusting fluted seatpost.

**Transmission:** TA Cyclotouriste triple alloy cotterless chainset with 5- and 6-point fixing, detachable 42- and 26-tooth chainrings plus integral chainring protector, and 180mm cranks. Sun Tour Perfect freewheel with 14-18-22-28-34-tooth sprockets. Sun Tour Cyclone front derailleur, Sun Tour VXGT rear derailleur with Sun Tour Mighty shifter II levers. Sedisport  $\frac{1}{2} \times \frac{3}{32}$ -inch chain.

Gear Ratios:	Sprocket Size					
	14	18	22	28	34	
Chainring	42	81.0	63.0	51.5	40.5	33.4
Size	26	50.1	39.0	31.9	25.1	20.6

**Wheels:** Cleland large-flange alloy hubs, plastic spoke protector disc on rear. Super Champion 650B alloy rims, 36 × 36 rustless 12-gauge spoking. Stud Hakka 26 × 2-inch tyre on rear, 26 × 1 $\frac{1}{8}$ -inch on front. Bikit chromoplastic mudguards.

**Brakes:** Cleland internal-expanding alloy hub brakes, with cable adjusters, Magura alloy levers, blue cables.

**Pedals:** Sun Tour BMX MP-1000 alloy double-sided pedals with blue-anodised cages.

**Accessories:** Chainset guard, bottom-bracket bash-plate, Blackburn carrier, Carradice Mono pannier, Blackburn alloy bottle-cage and Thermos flask, Esge kickstand, Bluemels alloy pump, tool-kit and puncture-repair outfit, brake-lever retaining elastics.

**Colour:** Stone Grey

**Weight:** Approximately 38 $\frac{1}{2}$ lbs.

**Price Guide:** £460.