RANGE

The car that can do anything

The Range Rover is such a subtle, sophisticated design that it has won respect and even awe from engineers of the world's top luxury car builders. We test it and add our own accolades.

IF ROVER'S engineers had known 10 years ago what they know now, they might well have produced the Range Rover without four-wheel drive.

The fact is that the R-R has become a hot cult car among the beautiful people — these days far more likely to be seen around the posh areas of Double Bay or Toorak than battling the corrugations and drifting sand somewhere the other side of Birdsville.

Yet the Range Rover's basic design — two live axles, semi-elliptic springs all round, high ground clearance, short body overhangs, high/low range transmission, rugged and roomy two-door wagon body and a durable torquey engine — are intended expressly for the kind of off-road or back country work a ute or sedan just can't handle.

It's only the exceptionally clever refinement of the R-R's basic design "crudities" (non-independent suspension, high centre of gravity and un-aerodynamic body) that make it a supple-riding suburban Afghan-hound transporter.

Of course, four-wheel drive has always been a status symbol of sorts. There have always been people who bought Land Rovers and Land Cruisers, tricked them up with bull bars, long-range tanks, winches and all manner of gear that looked "outback" and dreamed of tussles with Mother Nature to the tip of Cape York — while never venturing beyond the national park 20 kilometres out of town.

The R-R gets more of these people in because it is better-bred and easier to live with than any 4WD before it. It also costs around 11 grand on the road and that immediately puts it above the peasantry. Also, there are still considerable delivery delays here — as in other countries. It's the soul of one-upmanship to be driving something the other man can't get, even if he has the money.

As for breeding, the Range Rover smacks of creaseless safari suits, Swedish pipe tobacco and idyllic journeys across appalling country, with Her serene at your side. By comparison, a Toyota Landcruiser or Datsun Patrol is more your Ardath and sweaty workboots kind of 4WD.

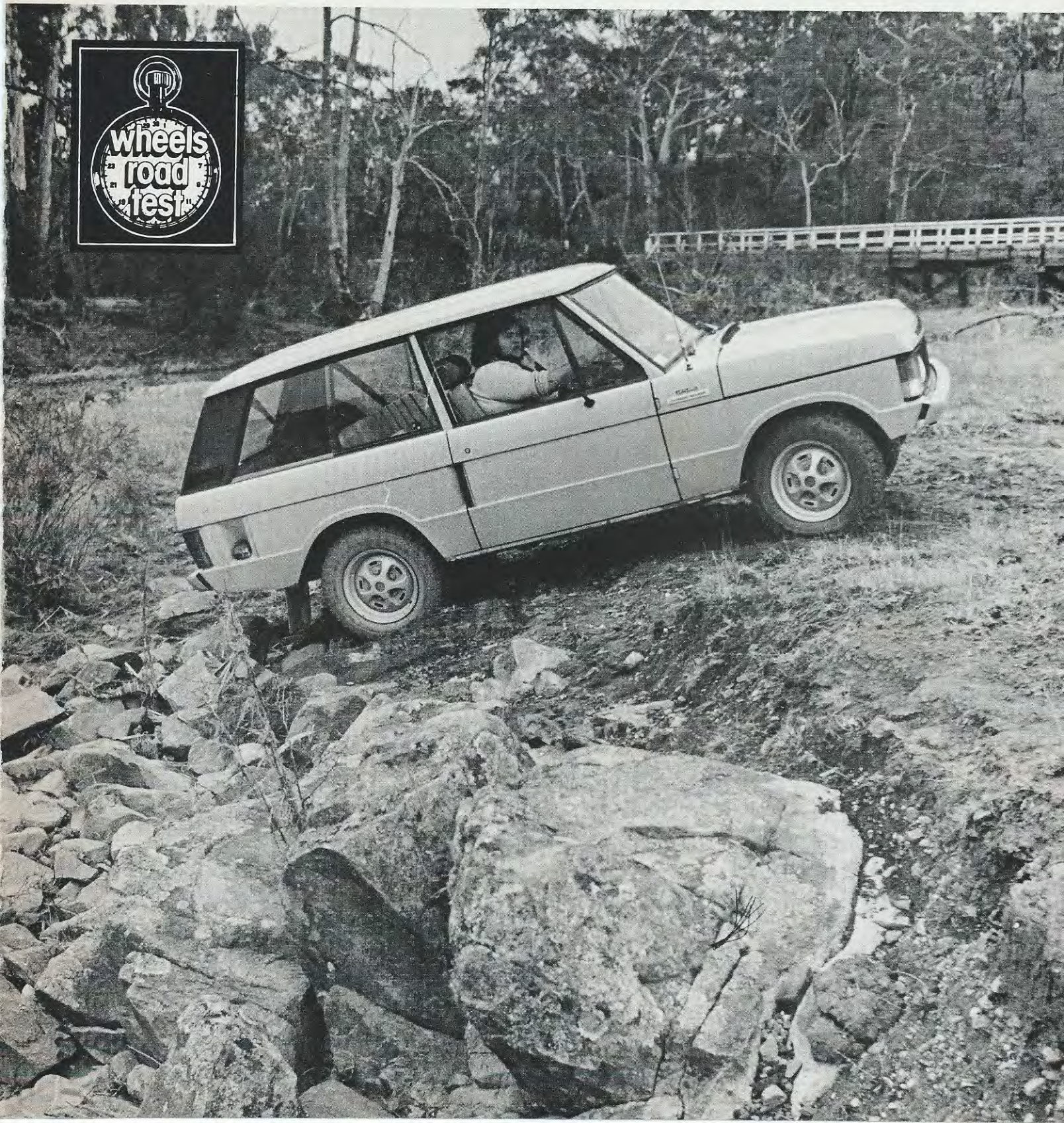
But it's as well for the Range Rover's sales — even to the beautiful people — that the engineers *did* give it four-wheel drive. Buyers that don't need the extra traction have it to enhance their rugged individuality . . .

If we sound a little critical of the 4WD poseur brigade it's because we've just done a couple of thousand kilometres in a Range Rover and by screwing up our courage and taking

Range-Rover corners neutrally under extreme provocation on bitumen. Tyre distortion shows cornering effort. Body roll looks severe but feels fine inside.

Photography: Uwe Kuessner.

ROVER



RANGE ROVER

what (at the time) seemed rather foolhardy chances, we've managed to investigate about 60 percent of the Range Rover's extraordinary on and off-road capabilities. If we had the opportunity we'd like to explore it totally. Can you blame us for a gentle dig at those who, if they own it 10 years, will never know more than 20 percent of what their Range Rover can do?

For our test Leyland's livewire "truck and bus" man Ric Towson supplied is with an off-white Rover nicely run in with around 5000 kilometres up and equipped with air-conditioning, a stereo radio/cassette player and the relatively new power steering option. In the beginning we suspected the power was a sop to the moneyed ladies who wheel Range Rovers into supermarket car parks on Saturday morning and have to be shown how to open the tailgate.

Our plan was to hie the Rover to Perisher Valley by the quickest (not necessarily most direct) route and to immerse it up to its eyeballs in snow and sludge; then stand back and watch how it got itself out.

Unfortunately the snow wasn't falling on the test weekend so we had to settle for sand, some extremely slushy wet black soil, a couple of scarily-steep rocky gradients and a lot of secondary bitumen road. And a basic Range Rover rule emerged — something which will apply unfailingly to drivers of the vehicle (excluding weekend buggy racers and Land Rover drivers of 20 years' experience).

Quite simply; you run out of courage long before you run out of traction. You screw yourself up to attempt a manoeuvre which is on the limit of sanity and the R-R will make mincemeat of it. It will even cope with things you feel are totally beyond the bounds of all reason.

The Range Rover has been around for three or four years in Australia now. WHEELS tested one in May '72 — six months before the first of the Leyland imports arrived for general sale. In its early production stages the R-R didn't always fare well. Enthusiastic European journalists leapt off large jump-ups in their test Rovers and bent axle housings. Others had clutch and gear selection troubles. There were initial assembly problems too.

The first cars to come to Australia were not immune to transmission gremlins and a modification was introduced to cope with gear meshing woes. Later models had the problem corrected at assembly. It's ironical that now Range Rovers have their development problems behind them, most are settling down to the suburban easy life.

The Range Rover has no direct competitors in the Australian market (or anyone else's for that matter). It slots in considerably above the Land Rover, Toyota and Datsun 4x4s, which mining companies and Government departments still buy holus-bolus.

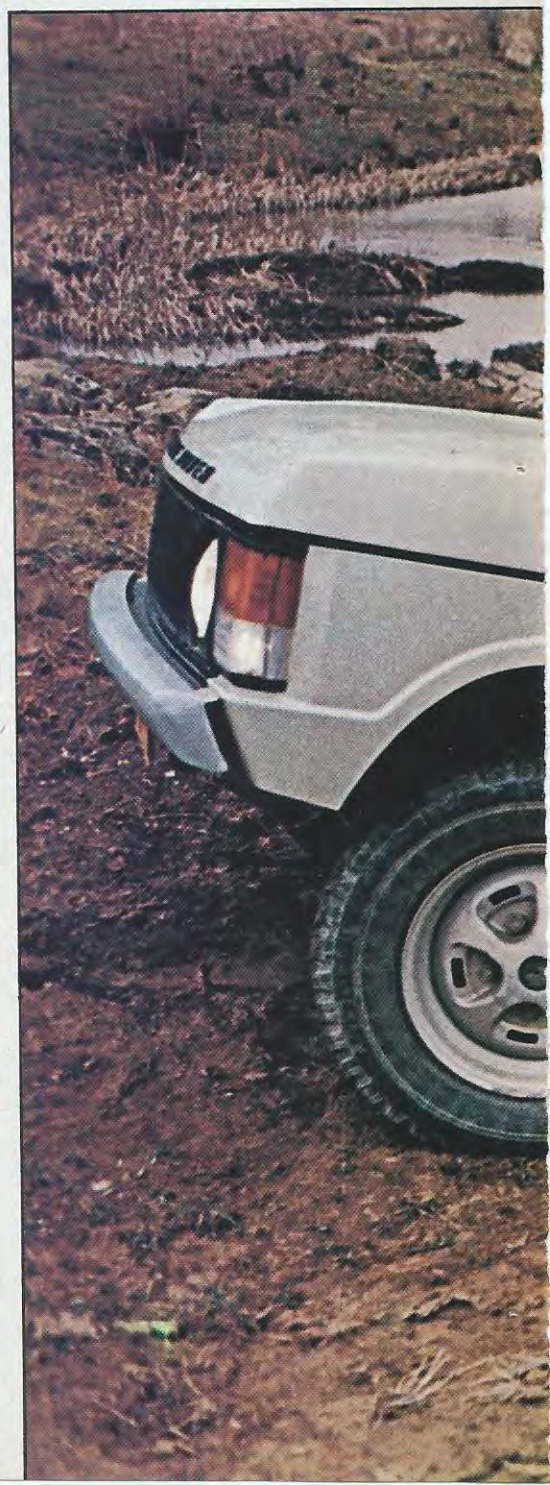
For prestige the Range Rover probably trail the very limited American imports Ford Bronco and Chevvy Blazer, but both of these are bigger, brassier and in ride and comfort terms are less refined. They have miles more horsepower than the Brit, though, and cost as much or more because their prices depend on what the importer feels he can get.

The Range Rover has a welded box section chassis frame which supports a steel base plate. The body panels, most of them aluminium and, therefore, rust-proof, fit onto the base as separate painted units. The engine is the 3.5-litre aluminium V8 which started life as a Buick unit and was then taken over by Rover and used in the 3.5-litre and the "Three Thousand Five" version of the Rover 2000.

The engine drives both front and rear wheels all the time, unlike most other four-wheel drives, which have a transfer box allowing use of either two- or four-wheel drive. But the Range Rover differs from the other four-wheel drives in having a third differential (the first and second are at front and rear of the car) to distribute the power smoothly between front and rear axles. This cuts out the transmission wind-up which other 4WDs suffer from and allows both axles to be driven at all times.

There is a vacuum switch for the third diff which allows the driver to lock the third diff completely so that

Below:
Rover buckets are durable, firm and comfortable over big distances, but don't recline. Note how dash has identical depressions left and right to cater for both left and right-hand drive versions. Air-conditioner restricts knee room.



drive reaches front and rear diffs equally as it does with an "ordinary" 4WD. The lock needs to be engaged only for maximum traction situations and must be disengaged for normal running. It's a common misconception that the lock worked on the other diffs too, giving the Range Rover a totally slip-free system in which all wheels must turn. This is quite wrong; the diff lock simply puts the R-R onto a similar power transmission footing to the Land Rover, Datsun Patrol or Toyota Landcruiser.

The suspension is simply yet cunningly designed. There are live axles front and rear, both suspending the body with coil springs and vertical mounted telescopic dampers. At the front the axle is located by two radius arms and a Panhard rod, while at the rear there are radius arms and a large longitudinally mounted A-arm (one mounting on the diff, two on the chassis) which incorporates a "Boge Hydromat" self-energising level ride unit.

This unit, which looks like a big-bore shock absorber, ensures that the R-R rides level even if you've just dumped a large load in the back. The unit pumps itself up to a pre-determined level on the motion of the suspension over bumps — thus the suspension sinks under load at first but a couple of kilometres later it's back to normal height again.

The suspension system also has exceptionally long travel — especially for such a massive system as that on a 4WD. The dampers are whoppers and are mounted very close to the vertical to provide good control throughout the suspension's travel.

The whole caboose weighs 1734 kg (1.7 tons), which immediately dispels any illusion you may have had about lightness because of aluminium panels. The fully laden weight is a whopping 2504 kg (5520 lb).

The 3528 cm^3 all-aluminium V8 is a detuned version of the sedan engine. It produces a mere 97 kW (130 bhp) DIN at 5000 rpm, but the torque rating of 250 Nm (185 lb/ft) is healthier and developed low down at 2500 rpm.

The engine has all the usual V8 attributes. It is quiet, unobtrusive and smooth, but sounds rather massive when revving hard. Because the Range Rover is big and the engine is relatively small, the engine needs to be used with a bit more verve than most V8 drivers expect.

The Range Rover keeps up with city traffic easily and on the open road it can cruise comfortably at 130-140 km/h, though at that stage

there isn't much passing urge left.

To all our testers the gearbox was the least refined part of the Range Rover. It is quite heavy to use, fairly sloppy in movement with a long-travel, wide gate and slow syncros. It is straight from a light truck in fact but there are many heavier vehicles with better gearchanges than the Range Rover.

The unit is undoubtedly robust and this is Rover's reason for using it. All the indirect gears are rather short for open road work and you tend to leave the car in top anywhere above 80-90 km. There are markings on the speedo for maximum speeds in the gears and though the engine can be made to spin well past the indicators (42 km/h for first, 69 for second and 113 for third) its accelerative power falls off above them. If the driver sticks to them rigidly the engine will deliver maximum performance.

At the dragstrip the Range Rover turned a standing 400 metres time of 20.1, which is excellent considering its body weight and super-slow gearchange. But above 110 the acceleration tapers off — it takes nearly 11 seconds to go from 110 km/h to 130 km/h.

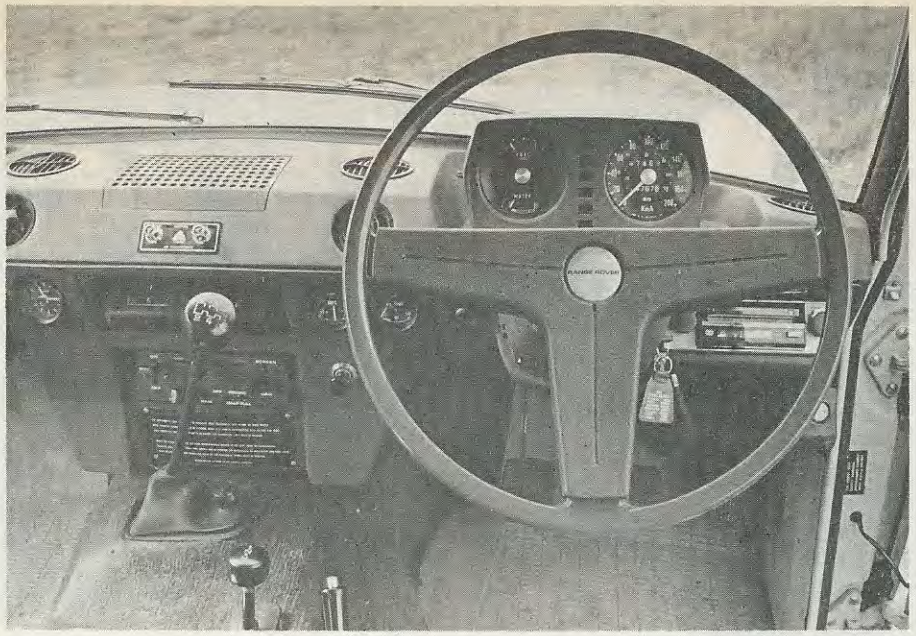
The gearbox and transfer case emit loud gear whines in all ratios including top, but the interior soundproofing is so good that they are best heard from outside the car. That's not to say they aren't evident as you're driving along; the point is, they're not intrusive.

The Range Rover was never built to conserve fuel. It has a hard-working V8, bags of body weight and a transmission system which, while efficient as any available, must cause a greater power loss than two-wheel drive systems. We found on test that the 'round town and cruising consumptions varied little. The consumptions in both environments seemed to vary between 5.33 and 5.86 km/l (15 and 16.5 mpg), depending on the type of treatment the R-R was given — easy or hard.

We suppose if you concentrated on driving for economy you could up the consumption to around 6.2 km/l (17.5 mpg) but to do any better than that you would need to start declutching on downhill slopes and switching off at stoplights.

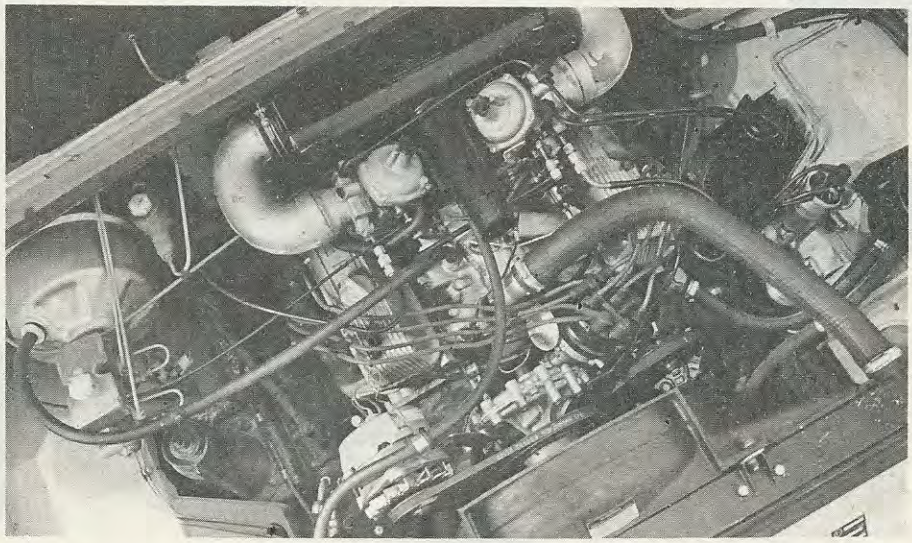
The handling of the Range Rover on either dirt or bitumen is astonishing, but it doesn't appear to be at first. If you step into it after a long period in a sedan you feel rather precariously perched above the road — even though the vision is magnificent. To make matters worse, you've probably heard hair-raising tales about how some 4WD vehicles tend to trip and fall with little warning if they are cornered hard. Your first drive of the R-R is, therefore, rather tentative.

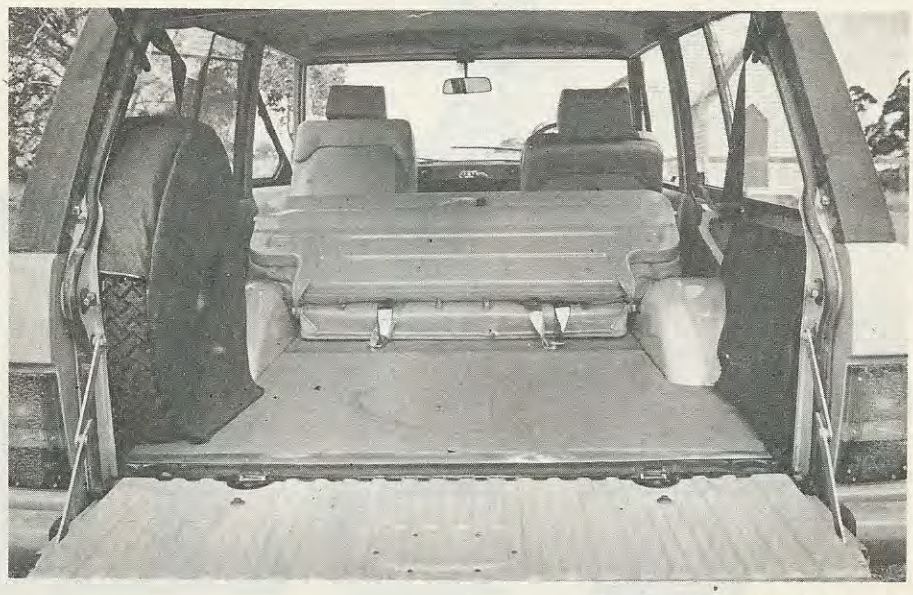
(Continued on page 76)



Dash layout is practical and durable but four minor dials on lower face of dash are very badly placed. Knob at right of gearstick is diff lock; short, lever is high/low range lever.

Rover engine is smooth, quiet, detuned version of 3.5-litre all-aluminium sedan engine. It performs very well considering Range Rover's considerable body weight.





Range Rover's loadspace isn't long compared with a local wagon, but it's higher, wider and easier to get at. Rear seat backrest folds forward or whole assembly can be unbolted and left in the garage. Spare wheel is sensibly mounted out of the way.

RANGE ROVER

Continued from page 41

Later, you discover that it can be hurled into wide, sweeping open road bends with considerable abandon because by that time you've come to accept the fairly large body movements that accompany cornering. The only time body roll becomes a little uncomfortable to seasoned Range Rover travellers is when hurled through a tight S-bend where the body moves from side to side.

The actual cornering power is very high. The weight distribution is closer to 50/50 than many sedans can claim, there is power and traction at both ends, the non-independent suspension keeps the wheels vertical to the road surface at all times and the tyres are hefty Michelin radials. The high centre of gravity causes body roll but for anything less than racetrack speeds there is no feeling instability.

On ordinary dirt roads the Range Rover is very quick. It has a good grip on the road and extreme chassis rigidity which can be felt through the seat of the pants. As you'd expect, it can be hurled over ruts and corrugations with no thought of bottoming and because the cabin is further than normal away from the wheels, surprisingly little road noise makes it to the cabin.

It's difficult to get the Range Rover to exhibit any clear cut handling characteristic. On bitumen corners taken very fast there is enough understeer to allow the driver to back off the throttle and ease the nose in a little. On dirt, where V8 power and live axles would lead you to expect tail-out motoring, the R-R exhibits no characteristic at all.

We became almost impatient with the test R-R because it wouldn't "do anything" and finally lined up a lonely corner with plenty of run-off space and proceeded to drive through perhaps a dozen times — each a little faster than the last.

Finally, at a speed which would seem utterly suicidal if you were approaching the bend for the first time, the Range Rover let go — both ends at once. It simply moved outwards gently from the apex of the bend, gripped again and drove on up the road.

The Range Rover breaks all the rules with its soft, supple ride. It must have very high unsprung weight with its heavy wheels, tyres and full-width axles, yet its suspension keeps road shocks out of the cabin remarkably well. The telescopic dampers must be very powerful because they provide good wheel control at all times and the Rover resists axle hop on bad surfaces far better than, say, a Holden rear end. The excellent location helps here too.

The body (and the passengers) move around quite a lot over uneven surfaces because there is much greater distance between the point or fulcrum of the movement and the passengers than in a normal sedan. It's like a lever — the further you are from the fulcrum the greater the distance you must move the lever to do a given amount of work. The important thing is that in the Range Rover, these body movements are so well cushioned by the dampers that they never become more than a physical curiosity.

The power steering is very useful in town. It needs only about 3.5 turns to swing the wheels from lock to lock and makes parking far easier.

We were most surprised to find, though, that it wasn't either too light or insensitive for high-speed out-of-town cruising. It certainly wasn't the best power-steer we've tried — that title probably belongs to the Rover 3500 sedan — but for most of the R-R's applications it's an advantage. It makes for easy off-road manoeuvring, too.

The Range Rover's ability where there are no roads is something else. It has a stubby lever alongside the normal four-speed gearstick which allows you to engage "low range". This lowers your four available gears so that first low range is a boggling 47:1 and top is only a shade above second in high range.

Near the base of the "ordinary" gearlever is the vacuum switch for the diff lock. You almost never need to use first in low range because second or third can do all the sand or mud or mountainside crawling you need. First and second have the potential to twist

the axles off if the power is used brutally while they are engaged.

In second-low the Range Rover will crawl up inclines that are so steep that you can't see any ground for the vehicle's rearing nose. You have to look out of the side window. In second or third low the Rover will crawl through mud, "walking" about a little as it searches for the best traction but resisting wheelspin in a way that amazes habitual drivers of two-wheel drive cars.

In sand, the Range Rover's performance isn't so good if you're using standard tyres and pressures. The block-tread Michelins, especially if combined with too low a gear, tend to dig holes in the sand and slow the car down. However, Rover specifies lower "emergency soft" tyre pressures which cater for this. The tyres, when deflated, have a greater contact area and resist bogging better. This is probably why Rover includes a foot pump in its toolkit.

The R-R's bush performance is so competent that it would take a month of weekends to find the limits of its ability in sand, bog and on steep inclines. Its only weakness in these conditions (a weakness of most four-wheel drives) is that if it is on a cambered boggy road, the two inside wheels with least weight on them will spin and lose traction.

At first glance the Range Rover interior disappoints you because there is obviously insufficient room behind the front seats to make anything but an emergency "marooned by floodwaters" sleeping area. A domestic six-cylinder station wagon runs rings around the R-R for length. But in width, height and size of loading opening, the Rover is exemplary. The lack of length makes sure that most of the load is carried inside the wheelbase — an important consideration for good handling in extreme conditions.

The rear seat backrest folds forward onto the cushion, but it doesn't fold away like a normal station wagon's. You can remove the rear seat easily by undoing a few nuts and leaving the whole lot at home.

The front doors are wide and there is a lever at the side of each front seat which cants the backrest forward and releases the whole seat to slide to its foremost position, to allow easy access to the rear. Rear passengers sit high on a firm vinyl-covered, foam rubber seat.

The front seats are handsome, enveloping bucket seats which support you right to your shoulders and have a wide cushion with bolstering on either side of your thighs. They are also firm but very comfortable. Surprisingly, they don't recline.

The test car had a Mark IV air-conditioning unit, fitted under the passenger's side dash. We found that it waged a never-ending war with our (tall) front passenger's knees. It would have been OK but the passenger's bucket had to be fairly well forward on its mountings to leave room for a large rear passenger. Without air-conditioning there would have been no problem.

The driving position is first-class. The steering wheel is large but it is mounted low and fairly well away from you so that with hands at 10-to-2 your arms are nearly straight. There is plenty of room for the biggest feet because the driver sits well off the floor and his feet reach "down" to the pedals rather than "out".

The Rover's waistline is very low and the driver sits high above the bonnet so he can see right down in front of the car. Vision is similarly good all round. The driver perch gives a sensational view of traffic ahead in the city.

The Range Rover dash is a masterpiece of practicality from the manufacturing point of view, but in use it could be better. The main part of the facia has symmetrical depressions both left and right. The one on the right (for Australian and British Range Rovers) contains a simple two-dial binnacle, while the left-hand one is turned into a knick-knack tray with a "grippy" rubber mat on its bottom. All Rover needs to do to make left-hand drive dashes is to swap the binnacle to the other side. The components for right- and left-hand drive cars don't differ.

The two main dials, containing speedo (in one) and fuel and temperature gauges with a row of warning lights between them, are easy enough to see but the smaller dials — a

clock, oil pressure gauge, ammeter and oil temp gauge are curiously located low down either side of an air duct in the lower centre of the dash. The oil pressure gauge is the furthest away.

The hand controls — wands on the steering column — are fine. The only controls which must be reached for are the heater and air-conditioning (straightforward) and the hazard flashers, buried below the wands on the left of the steering column.

The handbrake is still a remarkably short lever mounted almost under the driver's knees. In first models it was almost useless but it has been refined lately so that it is highly effective and not too hard to apply or release.

The materials used to build and trim the Range Rover are of excellent quality — neat looking but with an obvious bias towards durability. Because the vehicle is a Rover it's better built than most English cars. It's more like a German.

If you buy one, resign yourself to the fact that it won't be cheap to own. Servicing is going to be expensive — especially if there is any working other than engine top-end adjustment and tuning to do. It will eat fuel, which at 75c a gallon is becoming a powerful drawback. If someone hits you and you bend a panel it'll cost heaps.

But on the other hand, the car has been deliberately built much more robustly than Rover sedans (which are pretty tough) and most of its components — engine, transmission, diffs — have been proven somewhere or other before.

In toto, it is a world-beating vehicle — a design which will be around a lot longer than 10 years hence because there simply won't be anything to surpass it. It is the essence of a multi-purpose vehicle; in fact, its abilities are so wide-ranging that it needs a special kind of human being to use it to the full.

It's a workhorse capable of laboring hard for many years but most of all it's an enthusiast's car to be owned and admired by someone who realises just how many design concentions it ignores to handle, steer, ride and stop as well as it does.

If you're contemplating buying a Range Rover, please don't do it for personal prestige reasons — it's far too good a car to be emasculated like that . . . *

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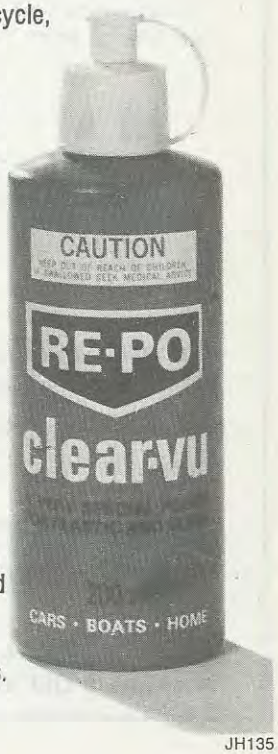


JH135

RANGE-ROVER

SPECIFICATIONS

MAKE . . . . . .ROVER
MODEL . . . . . RANGE ROVER
BODY TYPE . . . . . .2-door wagon
COLOR . . . . . Beige
PRICE Basic $10,683
As tested $12,192
OPTIONS FITTED . . . . . Radio/cassette player, air-conditioning power steering

ENGINE:
Cylinders . . . . . Eight
Valves . . . . . Overhead, pushrod operated
Carburettor . . . . . .Twin Zenith-Stromberg CD2
Fuel pump . . . . . .AC mechanical
Oil filter . . . . . Full flow
Compression ratio . . . . . .8.5 to 1
Bore x stroke . . . . . .88.9 x 71.12 mm (3.5 x 2.8 in.)
Capacity . . . . . 3528 litres (215 cu in.)
Power at 5000 rpm . . . . . 98.4 kW (Din) 132 bhp (Din)
Torque at 2500 rpm . . . . . .251 N-m (Din) 185 lb/ft (Din)

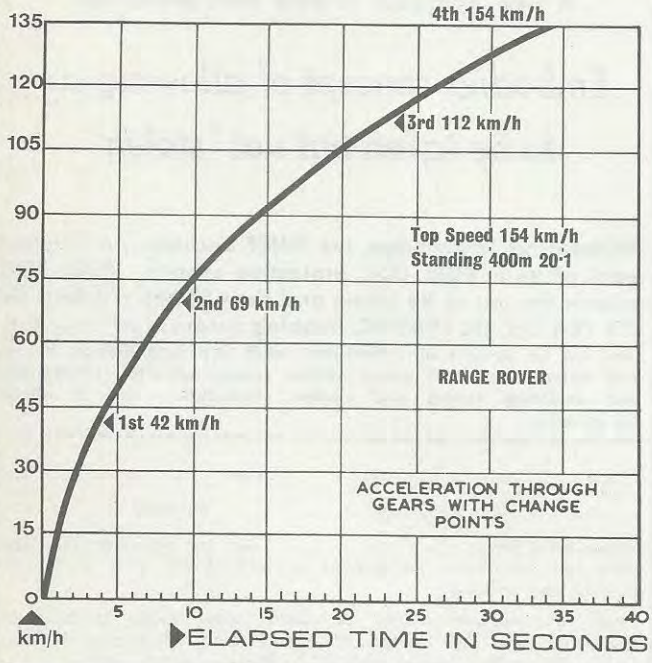
TRANSMISSION:
Type . . . . . Four-speed manual, two-speed transfer box
CLutch . . . . . Single plate diaphragm, mechanical
Gear lever locations . . . . . Central

RATIOS (high range):

	Gearbox	Overall	km/h per 1000 rpm	mph per 1000 rpm
First	4.065:1	16.91:1	8.05	5.03
Second	2.873:1	10.17:1	13.30	8.31
Third	1.77:1	6.25:1	21.63	13.52
Fourth	1.175:1	4.16:1	32.50	20.314

RATIOS (low range):

	Gearbox	Overall	km/h per 1000 rpm	mph per 1000 rpm
First	12.381:1	43.83:1	3.09	1.93
Second	8.13:1	28.78:1	4.70	2.94
Third	4.997:1	17.69:1	7.65	4.78
Fourth	3.322:1	11.76:1	11.50	7.19
Final drive	3.54:1			



CHASSIS AND RUNNING GEAR:
Construction . . Box section ladder chassis, separate aluminium body
Suspension, front . . Live axle, coil springs, radius arms, Panhard rod
Suspension, rear . . . . . .Live axle, coils, support rods, self-leveller
Dampers . . . . . .Hydraulic telescopic
Steering type . . . . . .Burman recirculating ball
Turns l to l 3.45
Turning circle . . . . . 11.3 m (37 ft)
Brakes, type . . . . . Lockheed disc all round, servo assisted

DIMENSIONS:
Wheelbase . . . . . 2540 mm (100 in.)
Track, front . . . . . 1480 mm (58.5 in.)
Track, rear . . . . . 1480 mm (58.5 in.)
Length . . . . . .4470 mm (14 ft 8 in.)
Width . . . . . .1780 mm (5 ft 10 in.)
Height . . . . . .1780 mm (5 ft 10 in.)
Fuel tank capacity . . . . . .86 litres (19 gallons)
Kerb mass (weight) . . . . . .1724 kg (3800 lb)

TYRES:
Size . . . . . 6.00 JK x 16 (tubed)
Make fitted . . . . . .Michelin XM + 5 x 16
GROUND CLEARANCE . . . . . .190 mm (7.5 in.)

PERFORMANCE

(All performance figures run using Heuer timing equipment)

TEST CONDITIONS:
Weather . . . . . .Fine
Surface . . . . . Castlereagh Dragway
Load . . . . . Two persons
Fuel . . . . . Super
Power-to-mass (kerb) . . . . . 17.52 kg/kW (28.79 lb/bhp)
Piston speed at max power . . . . . 11.853 m/s (2333 ft/min)

SPEEDOMETER ERROR

Indicated km/h	50	70	90	110
Actual km/h	47	66	86	106

FUEL CONSUMPTION ON TEST: Distance and Conditions.
Check one . . . . . 5.86 km/l (16.5 mpg) over 224 km (140 miles)
Check two . . . . . 5.79 km/l (16.3 mpg) over 288 km (180 miles)
Check three . . . . . 5.40 km/l (15.2 mpg) over 404 km (252 miles)

MAXIMUM SPEEDS:
Fastest run . . . . . .154 km/h (96 mph)
Average all runs . . . . . .157 km/h (98 mph)

IN GEARS (high range):
First . . . . . .42 km/h (26 mph) (5200 rpm)
Second . . . . . .69 km/h (43 mph) (5200 rpm)
Third . . . . . .112 km/h (70 mph) (5200 rpm)
Fourth . . . . . .154 km/h (96 mph) (4750 rpm)

IN GEARS (low range):
First . . . . . .16 km/h (10 mph) (5200 rpm)
Second . . . . . .24 km/h (15 mph) (5200 rpm)
Third . . . . . .40 km/h (25 mph) (5200 rpm)
Fourth . . . . . .60 km/h (37 mph) (5200 rpm)

ACCELERATION (Through the gears):
0-50 km/h . . . . . .5.3 sec
0-70 km/h . . . . . .8.7 sec
0-90 km/h . . . . . .14.5 sec
0-110 km/h . . . . . .21.1 sec
0-130 km/h . . . . . .31.7 sec

	Second	Third	Fourth
30-60 km/h	3.6 sec	5.8 sec	10.2 sec
40-70 km/h	4.4 sec	5.6 sec	9.6 sec
50-80 km/h		6.4 sec	10.1 sec
60-90 km/h		6.4 sec	10.4 sec
70-100 km/h		7.4 sec	10.7 sec
80-110 km/h		8.4 sec	11.2 sec
90-120 km/h			11.7 sec
100-130 km/h			12.6 sec

STANDING START: 0-400 m (0-¼ mile)
Fastest run . . . . . .20.1 sec
Average all runs . . . . . .20.3 sec