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THE BIG THREE Auto Wagon Triple Test

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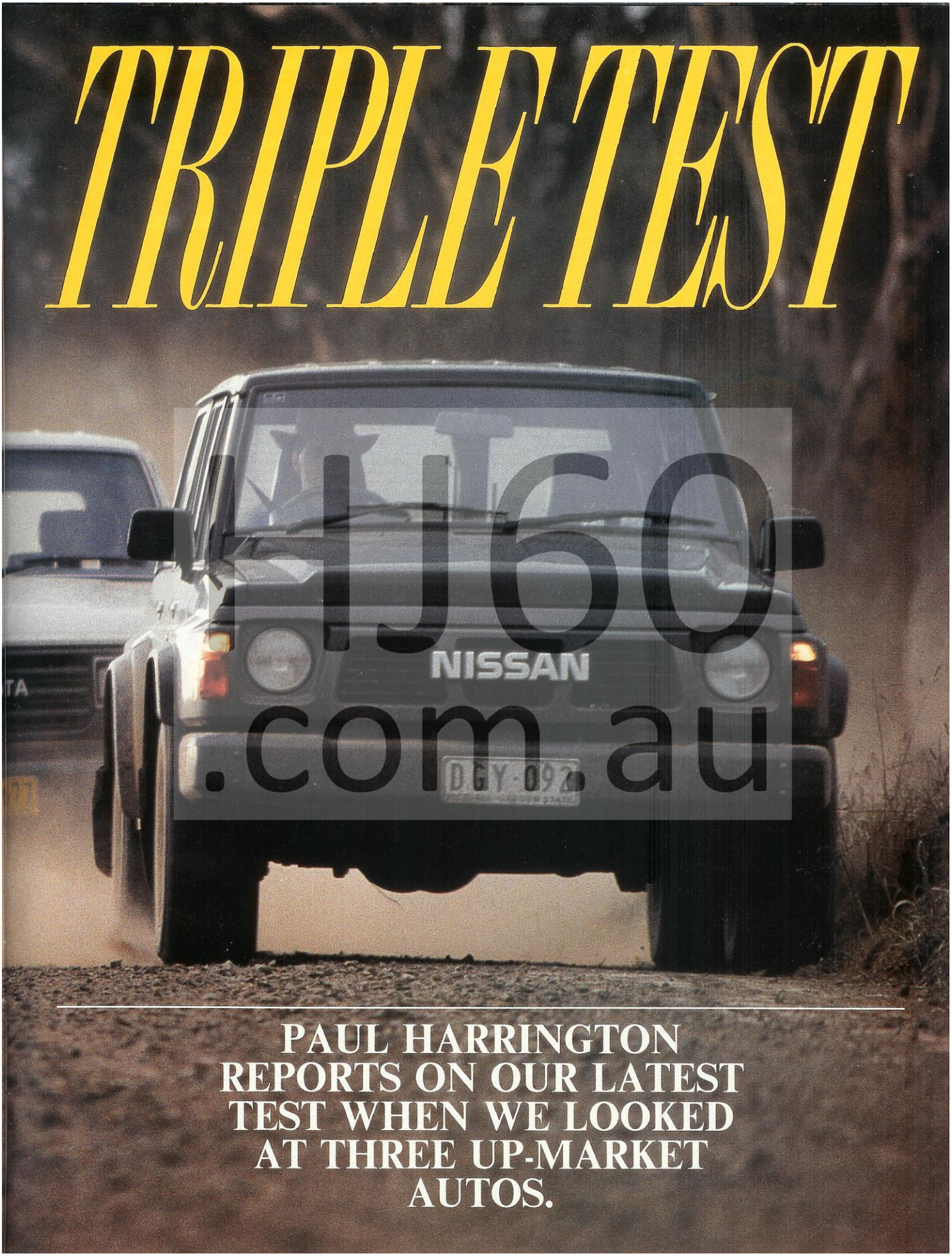

PAUL HARRINGTON REPORTS ON OUR LATEST TEST WHEN WE LOOKED AT THREE UP-MARKET AUTOS.

Automatic transmissions in off-road vehicles? It just doesn't seem right somehow. Still, they're a fact of life, and after all, people don't have to buy them.

Slush boxes, or as Dad used to call them "sissy boxes", are in the majority these days where the passenger car market is concerned. It follows then that 4WD vehicles were bound to feature automatic transmissions before long. Especially did this become more certain when the Toorak and North Shore nobs began running around town in their hobby farm hacks.

It took sheiks and princes to popularise the Range Rover, opening up a market which accumulated increasing interest from Toyota and Nissan. The former produced its first semi-civilised off-roader in the FJ55. It took Nissan a little longer to pick up the ball, but it did so, with mixed results, with the MQ wagon.

With these vehicles spending more time within city limits than in the Great Outdoors, demand for automatic transmissions soon grew to a clamor. Always eager to please, the manufacturers began satisfying that demand only a few years ago.

Now the trend has gone full cycle, with prices rather knocking the stuffing out of 4WD demand amongst the 'Rich and Famous'. We're still left with these supposedly mamby pamby units with their auto options, however. After all, which red blooded, dyed-in-the-wool off-roader would give such nonsense house room?

Well, we're here to tell you that surprises are in store for those who choose to challenge nature driving slush box 4WDs.

Though much of our testing favors the rugged type of 4WD vehicle, we do enjoy those times when the schedule includes luxury-optioned units. Such was the case when we took on to our fleet what must be the top three candidates for the luxury master stakes.

First there was the inevitable Range Rover — the thing which started all this. Next came our favorite, Nissan's GQ Patrol wagon, followed finally by Toyota's latest LandCruiser, complete with its revised suspension. For our purposes we ensured that all three units were petrol — engined, driving through automatic transmissions.

First then, let's look at the three gearboxes, and compromises they necessitate where other aspects of the

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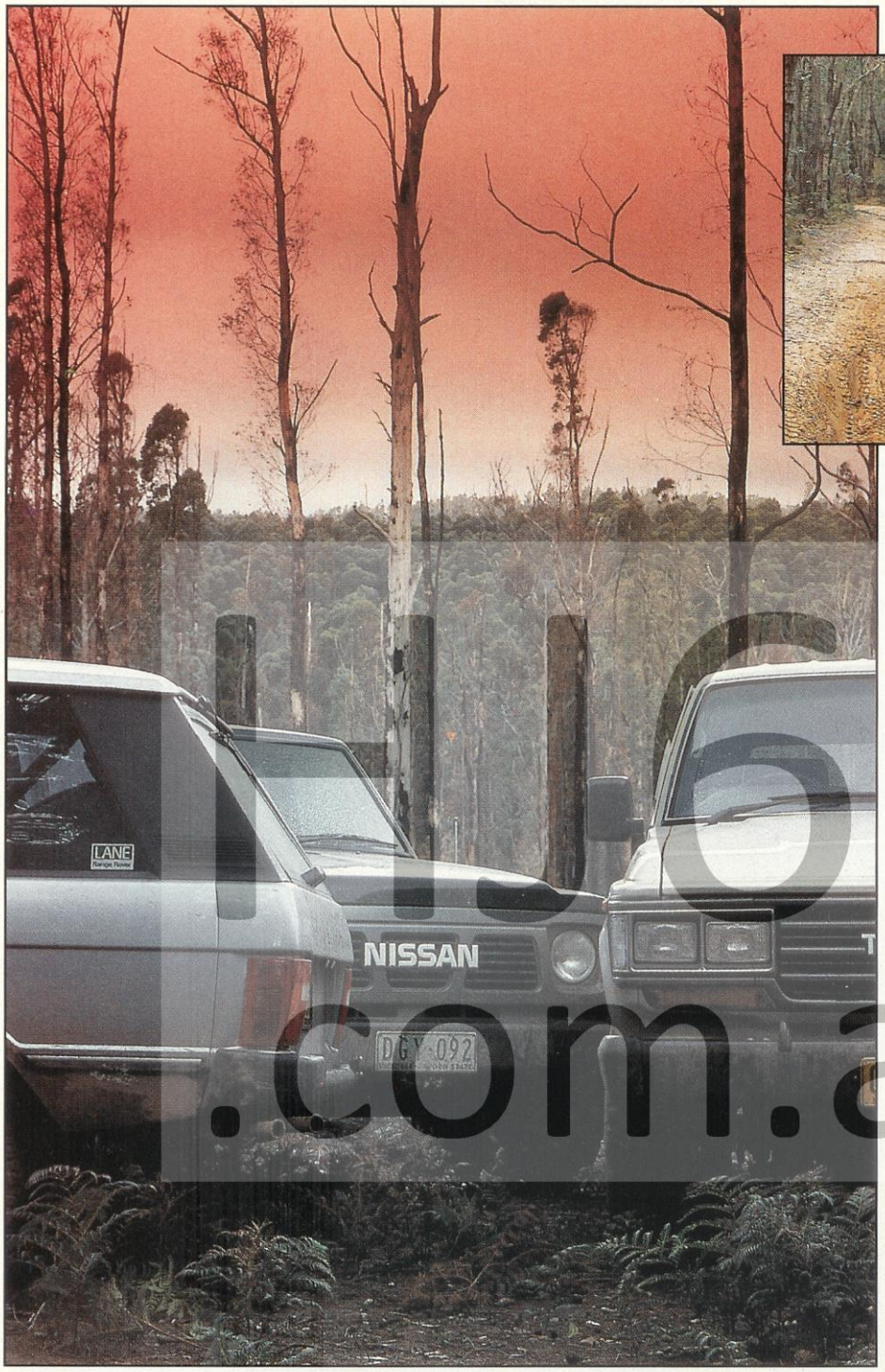

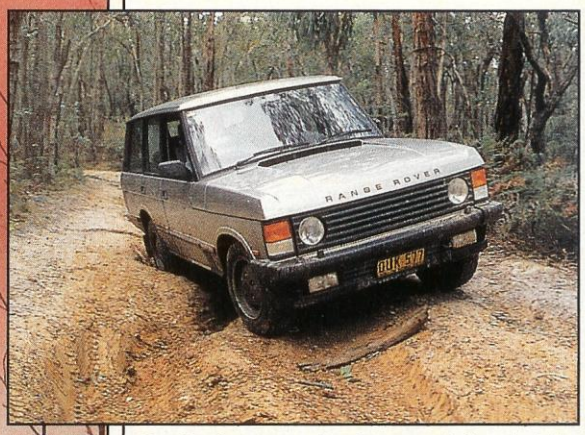

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vehicles' specifications are concerned.

The only constant 4WD unit of the three, the Range Rover, uses a German ZF auto transmission. It has four forward ratios, top gear being a .7281 overdrive. Unlike many four speed units, selection of overdrive is by the shifter rather than by a separate control. Third gear is a 1:1 ratio, with second fairly close at 1.4795. First gear is 2.4795.

High ratio in the transfer box is indirect with a 1.222:1 high range, compared with low range at 3.320. Final drive ratios front and rear are 3.54:1. Both the transfer box and final drive ratios for the automatic are the same as for manual versions of the Range Rover, the latter differing by having a much lower 3.3214:1 bottom gear in its five-speed box.

Toyota was fairly late in releasing its four speed automatic transmission for the LandCruiser wagons. Bearing in mind the 'Cruiser's higher kerb weight — 2730kgs compared with the Rover's 1862kgs — but identical power output at 110kW, it's hardly surprising that lower intermediate gears should have been chosen. First is a lower 2.950, followed by 1.530 for second gear. Third is direct drive, but fourth is a .717 overdrive.

With these latest wagons the automatic transmission's transfer gearbox now features a lower low range, the original 1.963 unit having given way to a 2.295 gear to improve engine braking on descents. The box incorporates a lock-up clutch which locks up the drive train at speeds of over 70km/h in overdrive top.

Final drive ratio on the auto is the same as the manual at 4.111:1. By this means, compared with the Range Rover, Toyota chose to retain a higher transfer gear for low range, in concert with lower final drives and a lower bottom gear. After all, the Japanese 3F engine, with a torque figure of 241Nm at 1800rpm compared with the Rover's 255Nm at 2500, demands lower gearing overall if it is to achieve the same levels of performance.

Then there's the Nissan GQ Patrol wagon with its completely new engine and automatic transmission package. Like the others it's a four speed unit with the highest overdrive top of the three at a long .694:1. Again there's a direct drive third gear with second close to that of the 'Cruiser at 1.544. Bottom is between the Range Rover an LandCruiser at 2.784.

The Nissan's transfer casing has a 1:1 high range together with a 2.020 low range, this being the highest of the three vehicles. The Patrol has ex-

actly the same final drive ratios as the Toyota at 4.111:1. With a kerb weight of 2035kgs it comes almost mid-way between the other two vehicles. In terms of power and torque from the superbly smooth new 4.2 litre engine however, it's way out front! With 125kW at 4200rpm it has a 14kW advantage over both the 'Cruiser and the Rover. Torque is 325Nm at 2800rpm giving it an 84Nm advantage over its fellow Japanese and 70Nm over the Brit.

With all that technical stuff out of the way then, the big question was, could these vehicles hack it in the fairly rugged terrain of our mountain testing grounds? And if they could, would one of them shine out over the rest?

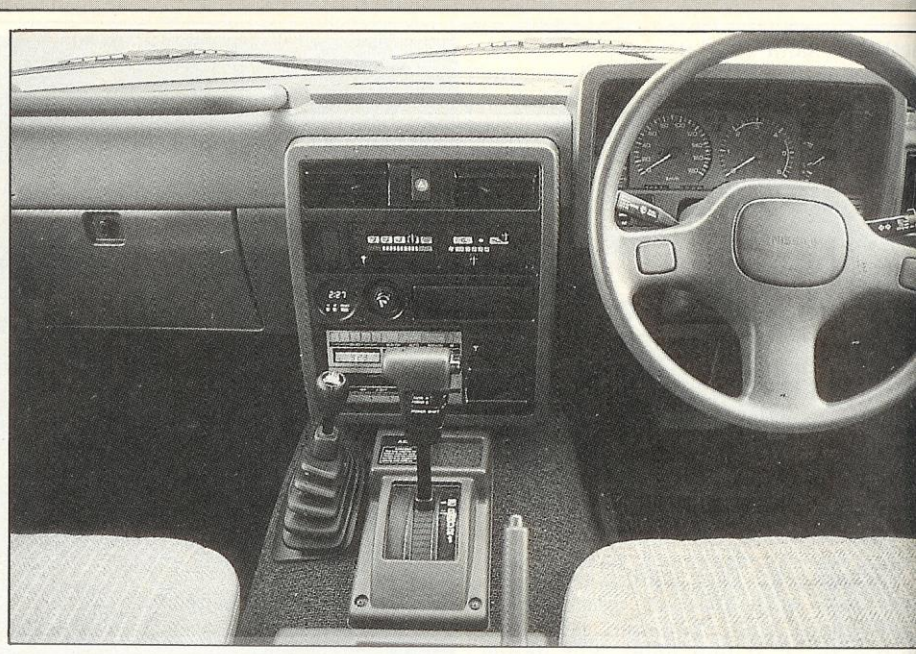
Perhaps the first significant thing one finds with off-road autos is that they climb well. You can stick the shifter in '1' if you want, but under normal circumstances there's no need, 'D' sufficing the majority of the time. Descending? Well that's something else again.

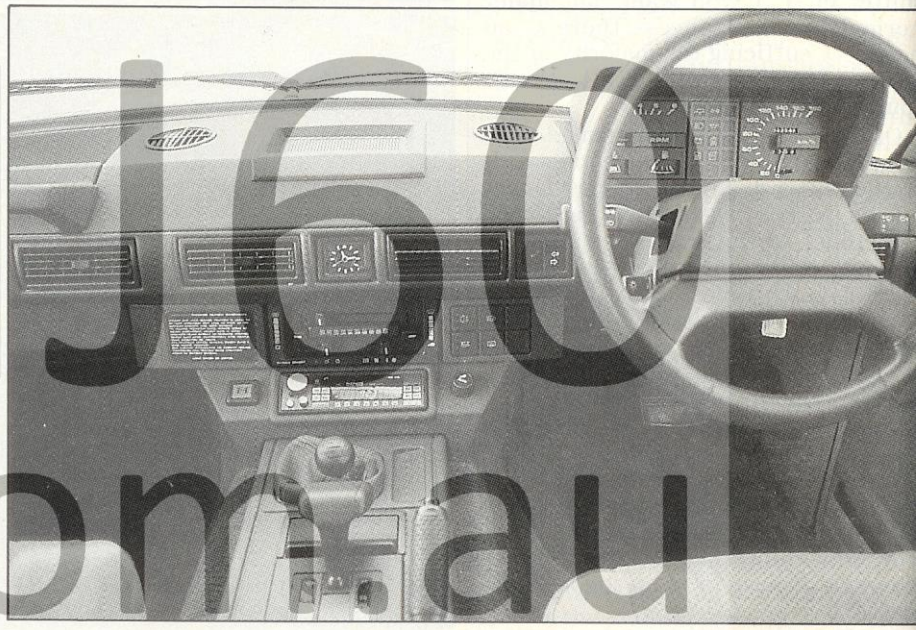
Of the three the Patrol seemed to be the least inclined to race away. It would potter down the steepest slopes on the overrun with only a rare need for a touch on the brakes — something we hate doing, but something that is necessary with most autos from time to time. The Nissan blotted its copybook only once and that was due to its tyres being wider than the others. The incident occurred on a short but steep drop down a muddy, clay-based hill into water. Here a dab on the brakes set it slithering sideways, threatening to turn through 90 degrees on this 35 degree slope. The only thing that saved the situation was a sharp prod on the throttle. Nasty!

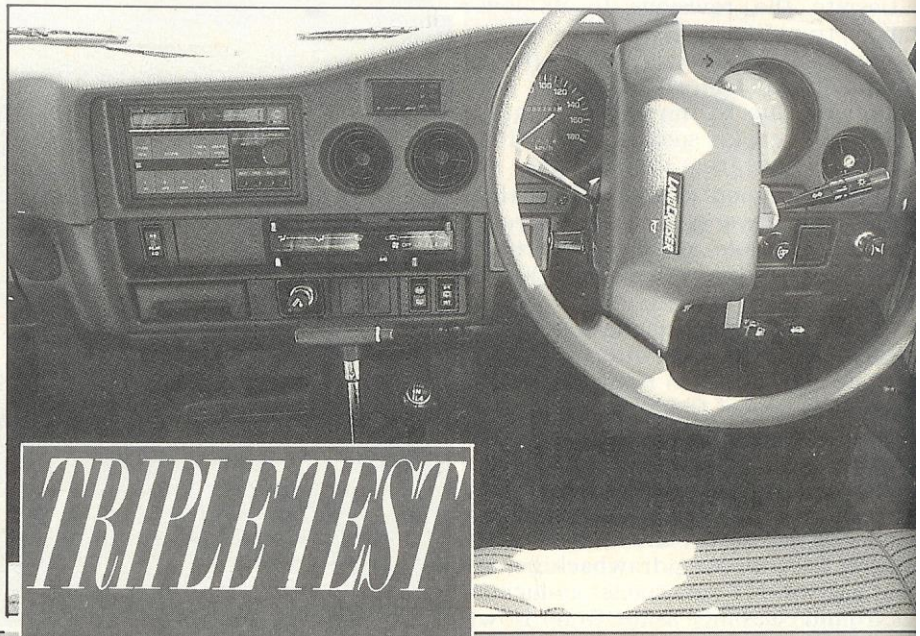
Despite the revisions to its low range transfer gearing, the LandCruiser still posed problems on those steep descents. Much of this is undoubtedly due to the vehicle's mass but it did evoke some heart-in-the-mouth feelings from time to time.

Almost as good as the Patrol, the auto Range Rover gained a little from the compression of the extra two cylinders, together with over 100kgs less weight.

As already mentioned, all three vehicles came through with flying colors on the ascents. None of them baulked at any of the hills despite the fairly mushy going. As we have found before, it was the Patrol that made the easiest work of it all, walking its way upwards without faltering. The same can be said for the Range Rover in this test, its only drawback being that ridiculous front spoiler reducing its ground clearance at the front. How







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it didn't get wiped off on this trip, we'll never know!

The only vehicle to give a slight hesitation on a hard rock and gravel climb of around 40 degrees, was the LandCruiser. Despite the much vaunted revised springing, there's still that old fashioned leaf layout. By comparison with the coil springing of both the Range Rover and the Patrol, the 'Cruiser suffers quite simply from a lack of wheel travel. It's this restriction which sees it baulk, if only momentarily, when obstacles are encountered.

It was the LandCruiser which was criticised most for its ride throughout the test. One person who accompanied us on the run had no experience of LandCruisers at all. His criticism of the ride qualities were countered by informing him that this was a major improvement over what had existed before! But this story is about the transmissions and their effectiveness in off-roading.

While the idiosyncrasies of the Range Rover's control layout are well known, it should be recorded that such criticisms also extend to the shift systems, both for the ratios and the transfer box. The shifter is invariably sticky, requiring some elbow grease to get it moving when the need arises. In addition the transfer level can only be operated with the main geabox in neutral and the vehicle at a standstill. The transfer shifter is always difficult to operate. In this case it was sometimes necessary to have a go in neutral, shift into drive and then back into neutral before the thing would engage with a distinct graunch.

Toyota's shift system was better and more easily operated, but best of all was the Patrol. Here is a high tech' transmission with electronic control for its automatic shift system. Like the Toyota it has a lock-up torque converter for improved economy on the highway, as well as 'power' and 'economy' modes controlled by a shift lever button. Set to 'power', shift points are moved upwards so that the lower gear is held longer in order to allow better acceleration. In 'economy' the shifts come earlier so acceleration is more gradual.

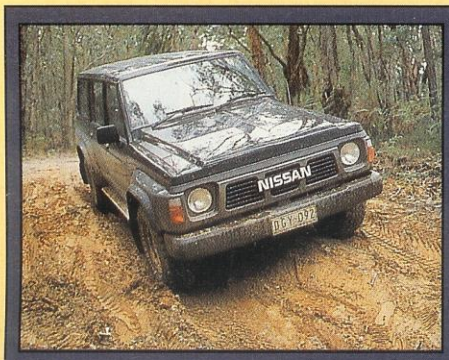
Planetary gearing in the transfer box provides smooth drive with reduced noise, while a transfer synchroniser allows changes between '4H' and '2H' on the move — a useful feature to be sure. Drive to the front wheels is by chain.

On the highway both the Toyota and Nissan autos worked very well, change points having been set at the most appropriate engine speeds. Both the Japanese vehicles have a clearly defined 'kick-down' gearchange as well. Here the Range Rover's ZF box fell behind. With the selector in overdrive top nothing less than full throttle would make it swap down a cog. And even in direct third there seemed to be no delicacy of feel in this respect.

On taking off from rest in overdrive top, the Range Rover's box would select that gear almost as soon as the unit was moving. As a result acceleration could be painfully slow unless one stirred the shifter around a bit. By contrast the 'power' and 'economy' modes of the Patrol give it the best of all possible worlds.

No matter how well manufacturers tailor automatic transmissions to off-road vehicles it is unlikely there will ever be a wholesale move over to them on the part of the more 4WD-dedicated public. There are just too many compromises in the gearing to achieve a perfect set-up. Of course, all that might change if the latest types of infinitely variable transmissions could be optimised for off-road use.

Until that time comes, current automatics are perfectly adequate for normal every day use, while still possessing enough capability to tackle off-the-bitumen going. Having said that, we still prefer manuals no matter what the conditions. **4X4**



NISSAN GQ PATROL ST WAGON

COUNTRY OF ORIGIN: Japan
SEATING CAPACITY: 5
PRICE: $39,330
OPTIONS FITTED: None
PRICE AS TESTED: $39,330

ENGINE:
Type: Petrol — Nissan TB42 Carburetted
Cylinders: 6 in line
Capacity: 4169cc
Bore/stroke: 96x96mm
Compression Ratio: 8.3:1
Power: 125kW@4200RPM
Torque: 325Nm@2800RPM

TRANSMISSION:
Gearbox type: RE4ROBA 4-speed automatic
Shift location: Centre console
Gear Ratios:
1st: 2.784
2nd: 1.544
3rd: 1.000
4th: 1.694
5th: —

TRANSFER BOX:
Ratios:
High: 1.000
Low: 2.020
Shift Location: Centre Console

AXLES/DIFFS:
Front: Manual free wheeling hubs
Ratios: 4.111
Rear: Limited slip diff
Ratio: 4.111

BODY/CHASSIS:
Construction: box section steel chassis
Material: steel panels
Kerb Weight: 2035 kgs
O/A Length: 4810mm
O/A Width: 1800mm
O/A Height: 1825mm
Wheelbase: 2970mm
Fuel Capacity: 95 litres

SUSPENSION:
Front: Beam axle, coil springs, leading links, Panhard rod, sway bar.
Rear: Live axle, coil springs, trailing links, torque reaction rods, Panhard rod, sway bar.

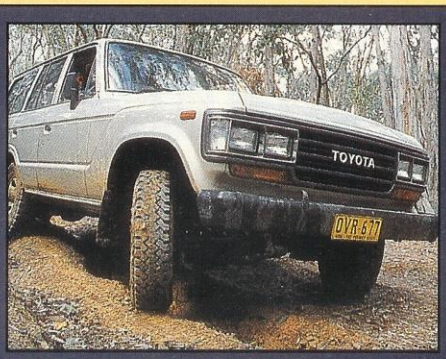
STEERING:
Type: Recirculating ball-power assisted
Turning circle: 11 metres

BRAKES:
Actuation: Hydraulic — power assisted
Front: Ventilated discs
Rear: Drum

WHEELS:
Material: Steel
Diameter/Width: 15ins/10ins

TYRES:
Make/type: Bridgestone Deser Duellers

OFF ROAD SPECS:
Approach Angle: 42°
Departure Angle: 30°
Ramp Over: 31°



TOYOTA LANDCRUISER GX WAGON

COUNTRY OF ORIGIN: Japan
SEATING CAPACITY: 5
PRICE: $42,133
OPTIONS FITTED: None
PRICE AS TESTED: $42,133

ENGINE:
Type: Petrol — Toyota 3F carburetted
Cylinders: 6 in line
Capacity: 3955cc
Bore/stroke: 94x95mm
Compression Ratio: 8.1:1
Power: 110kW@42000RPM
Torque: 284Nm@2200RPM

TRANSMISSION:
Gearbox type: 4-speed automatic with lock-up overdrive
Shift location: Centre console
Gear Ratios:
1st: 2.950
2nd: 1.530
3rd: 1.000
4th: 1.717
5th: —

TRANSFER BOX:
Ratios:
High: 1.000
Low: 2.295
Shift Location: Centre Console

AXLES/DIFFS:
Front: Manual free wheeling hubs
Ratios: 4.111
Rear: free
Ratio: 4.111

BODY/CHASSIS:
Construction: steel box chassis
Material: steel panels
Kerb Weight: 2015 kgs
O/A Length: 4750mm
O/A Width: 1800mm
O/A Height: 1885mm
Wheelbase: 2730mm
Fuel Capacity: 90 litres

SUSPENSION:
Front: Beam axle, leaf springs
Rear: Live axle, leaf springs

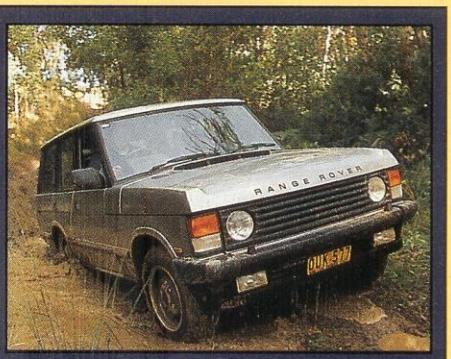
STEERING:
Type: Recirculating ball-power assisted
Turning circle: 13.4 metres
Turns lock to lock: 3.4

BRAKES:
Actuation: Hydraulic — power assisted
Front: Disc
Rear: Drum
Handbrake: foot operated on rear brakes

WHEELS:
Material: Steel
Diameter/Width: 16ins/7.5ins

TYRES:
Make/type: Dunlop Road Grippers
Dimensions: 7.50R-16.6

OFF ROAD SPECS:
Approach Angle: 37°
Departure Angle: 22°



RANGE ROVER HIGHLINE

COUNTRY OF ORIGIN: United Kingdom
SEATING CAPACITY: 5
PRICE: $79,950
OPTIONS FITTED: None
PRICE AS TESTED: $72,950

ENGINE:
Type: Rover EFI
Cylinders: V8
Capacity: 3528cc
Bore/stroke: 88.9x71.1mm
Compression Ratio: 8.13:1
Power: 110kW@4750RPM
Torque: 255Nm@2500RPM

TRANSMISSION:
Gearbox type: Zf 3-speed automatic with overdrive
Shift location: Centre console
Gear Ratios:
1st: 2.4795
2nd: 1.4795
3rd: 1.0
4th: 1.7281
5th: —

TRANSFER BOX:
Ratios:
High: 1.222
Low: 3.320
Shift Location: Centre Console

AXLES/DIFFS:
Front: Full time 4WD with lockable centre diff.
Ratios: 3.54:1
Rear: free
Ratio: 3.54:1

BODY/CHASSIS:
Construction: box section chassis
Material: pressed steel body frames alloy panels
Kerb Weight: 1862 kgs
O/A Length: 4449mm
O/A Width: 1818mm
O/A Height: 1792mm
Wheelbase: 2540mm
Fuel Capacity: 79.5 litres

SUSPENSION:
Front: beam axle, coil springs, leading links and Panhard rad.
Rear: beam axle, coil springs, trailing links, central 'A' frame, Boge self-leveling

STEERING:
Type: Recirculating ball-power assisted
Turning circle: 11.3 metres
Turns lock to lock: 3.25

BRAKES:
Actuation: Hydraulic — power assisted
Front: Disc
Rear: Disc
Handbrake: Drum type on rear drive shaft

WHEELS:
Material: cast alloy
Diameter/Width: 16ins/7ins

TYRES:
Make/type: Michelin Steel radial
Dimensions: 205XM+S200TL

OFF ROAD SPECS:
Approach Angle: 45°
Departure Angle: 33°