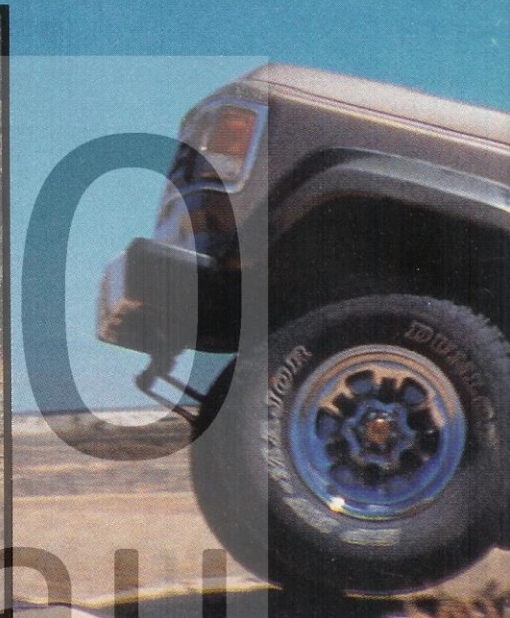
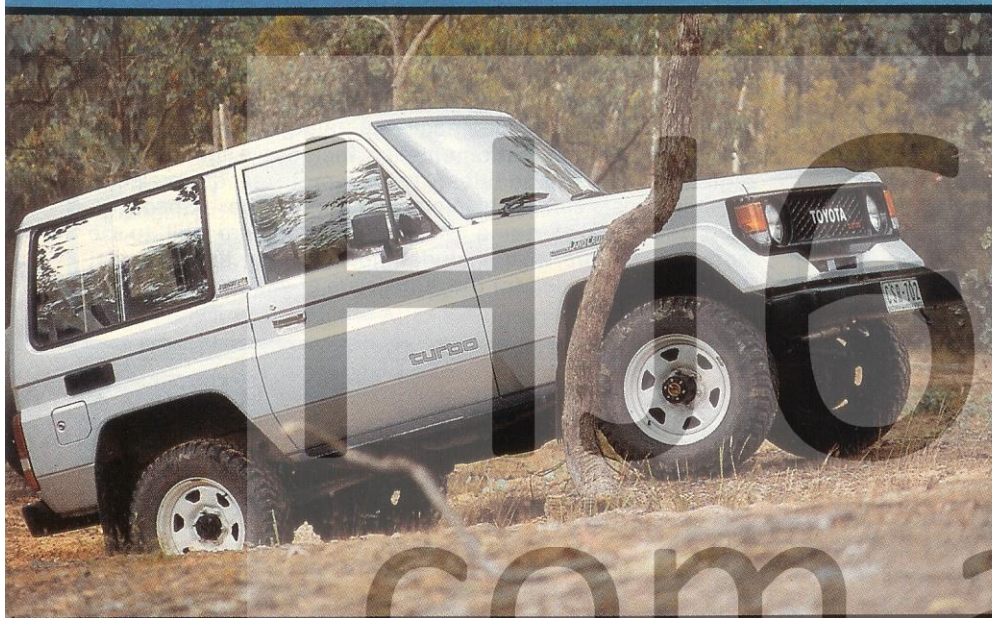


TRIPLE TURBO TEST

TOYOTA'S LANDBRUISERS



One Bundera, one mid-wheelbase and a 60 Series — all of them turbocharged diesels direct from the factory. Not bad for a month's work, but as Bob Maron reports, they're pretty fine engines and one of them may be the very best in its class. Toyota's done its homework.

For many years Toyota has been the giant of the 4WD market in this country, providing buyers with a wide range of vehicles which have proven both capable performers as well as reliable and tough workers. Of all current marques offering 4WDs in this country, Toyota is the one with the most widespread reputation for strength of build and resistance to wear and tear, but Toyota's sheer technology is just as impressive — witness the refinement of road cars such as the new Celica and twin-cam Corolla for instance.

But despite a claimed seniority in the high-tech stakes, Toyota is the last manufacturer from Japan to give us a force-fed diesel — a development which, now, appears so obviously a step forward (as proven by just about everyone else in the business) that it is difficult to understand Toyota's reluctance to get in on the act sooner. The reason, apparently, can be

put down to conservatism, but conservatism more in the marketing department than in any engineering section of the company.

Commercial vehicles — and that's where the Land Cruisers fit into the picture — are seen by the boys back in Japan as requiring a strong hard-working image. A "redneck" image if you like — and you don't get that by leaping on top of new fangled electronics and turbochargers before such contraptions have proven themselves in the "real world".

Now, Toyota is satisfied that the image of a turbo-charged diesel will not adversely affect its hard earned reputation for considered development. Hence the 2L-T, 13B-T and 12H-T heavy breathers. Three engines which Toyota claims have been long in the developmental and refinement processes in order to provide the best, most reliable and most suitable turbos around.

Photos: Barry Edmunds, Lou Milevski, Bob Maron



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BUNDERA

For the Bundera — "orphan" of the Land Cruiser range — the powerplant is the 2.446 litre 2L-T, and its inclusion marks the first use of a diesel in the "SWB" range. So this, in a lot of ways, is an all-new vehicle. The good part is that now, automatically, those who opt for a diesel don't have to put up with poor horsepower just to get that famed diesel fuel economy and low down slogging power. With the Bundera's first oiler, you get petrol-like power all through the range without compromising traditional diesel virtues.

The 2L-T engine is based on the normally aspirated 2L offered in Toyota's HiLux, 4-Runner, HiAce and Dynas, but, due to the use of turbine induction, develops some 15 per cent more horsepower and a whole 20 per cent more torque. Peak figures of 63 kW at 4000 rpm and 188 Nm at 2400 rpm compare favorably with some petrol alternatives, giving away between 10 and 20 kW in horsepower, but virtually matching the more important (for off-road use) torque figures.

To get the extra horses without risking durability, a number of internal and external changes had to be made to the basic 2L engine. Rocker arms feature roller cam followers for smoother valve actuation, camshaft timing has been altered for shorter inlet duration, new valve seat materials (sintered chrome and cobalt/nickel) have been used in exhaust valve seats for improved heat resistance, nickel-based alloys have been employed for the same reason in the valve heads themselves, all-metal pistons have been replaced by FRM (fibre-reinforced metal) units for improved piston cooling and wear resistance, piston pin size has been boosted from 27 mm to 29 mm for increased rigidity, a new crankshaft with five main bearings and eight balance weights (twice the number on the 2L) has been used and crankpin diameter is up from 53 mm to 55 mm. On top of all this, cooling capacity has been upped by fitting a three-row cooler and boosting radiator size.

As you can see, there's a lot to it. Sure, you can go out and fit a turbo from the aftermarket to your diesel 'Cruiser, but you don't get all these precautionary extras.

And even the blower unit itself is special. Rather than opting for the functional, but

basic, turbines now widely used as after-market (and OEM) fittings, Toyota has developed a more sophisticated system which contains, within the turbine housing, channels for water cooling. This system allows the extreme temperatures being transferred to the oil which lubricates the bearings to be kept at a lower level, thereby boosting the oil's resistance to breakdown and improving its lubrication characteristics. All very important when you remember the turbines are spinning at speeds up to 110,000 rpm!

But all that is by the way. The technical stuff is all very interesting but we covered much of that last issue — so what's the Bundera like to drive with boost?

First off, there really isn't a great deal of white smoke, even on a cold start-up. Switching on first thing in the morning can be done without hesitation: just turn the key and the engine clatters into life. Pre-heat time is absolutely negligible — on our test vehicle I couldn't detect any delay at all.

The injection system on the Bundera engine is not direct — rather, it is a single-hole indirect system because the bore dimension of 92.0 mm (the engine is exactly square at 92.0 mm x 92.0 mm) is too small for a combustion chamber nozzle. The glow plugs are Toyota's

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"quick-glow" units and, combined with an automatically controlled starting device (imaginatively acronymed ASCD) on the fuel pump which advances injection timing to aid cold starting, provide rapid pre-heating and instantaneous starts. It works — and it provides a fast idle automatically until coolant temperature is up to spec.

In common with most diesels, the Bundera is a rattly beast until oil pressure and temperature are raised to normal levels, but once warm the noise drops away. You still get some noise inside the cabin (sound proofing on the firewall could be much better), but at idle and moderate road speeds it is hardly noticeable. Once you've accelerated to 110 kmh-plus, however, the rumble again begins to intrude and, if you start using anything like the Turbo Bundera's maximum revs of 4800 rpm the noise becomes quite intrusive. You'll notice that as soon as you need a heavy foot in low range or get into the 120 kmh-plus bracket on the highway.

But, as with all Toyota's current engines, this one is well endowed with grunt. Down low — even before boost comes in — the Bundera pulls strongly and is almost unstoppable right on idle. From 2000 rpm — where turbo boost starts to make itself felt — acceleration becomes brisk and you've got more than enough horsepower to accelerate up the steepest climb or keep wading through deep, soft sand. No doubt about it: this is a strong diesel and, although top end urge tapers away (maximum speed on the highway is about 140 kmh), it has all the right ingredients for a tough, working powerplant.

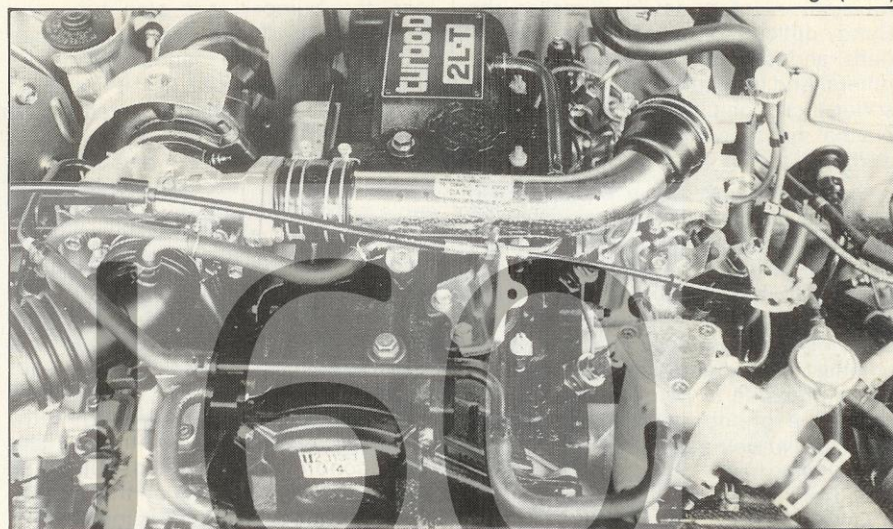
The power characteristics are just about spot on. Torque climbs rapidly from idle to a peak of 188 Nm at 2400 rpm. It remains above 180 Nm until more than 3300 rpm. Power peaks at 63 kW, 800 rpm below the 4800 rpm redline, giving a broad range of usable power that matches well with the diesel Bundera's new R151F gearbox ratios.

The diesel's standard limited slip, four-pin differential is set at a ratio of 4.875 compared with the newly lowered 4.555 ratio (from 4.300) on petrol models. Both vehicles use the same transfer ratios, with low range offering a reduction of 2.295:1 (the old ratio was 2.276). The gearbox itself is completely different to that used with the petrol engine (the G52), having all but the 1.00:1 fourth gear ratio altered to suit the 2L-T engine. First gear is significantly lower — 4.313 compared with 3.928 for the petrol — but everything else barring fourth is actually taller, though brought back into line by the diff ratios.

What this means is that first gear, low

range, is a real slugger — the overall ratio works out to 48.254:1. Petrol engines in the same gear have an overall reduction ratio of just 41.06:1. At the other end of the scale, top gear high range gives the turbo Bundera a tall 20.57:1 while the shorter geared petrol engine gets only 21.60:1.

Despite this seemingly wide spread of gears, there is little hint of the gear



spacing being too wide. The gap between second and third can occasionally catch you out, especially if you allow boost to drop off during the change, but the problem is certainly not serious and makes little practical difference.

Surprisingly, first gear low is actually too low for some off-road situations in which you might expect to need it. On one particularly steep climb I had to slip into second because there was insufficient momentum in first to get over a small step that the suspension was unable to cope with gently enough. That, however, is more a comment on the too hard springs than the gearbox.

The shift itself is a delight. There is only minimal notchiness, the engagement is positive and the lever is positioned within easy reach and in such a manner that it doesn't interfere with either driver comfort or his ability to operate other dash-mounted nick nacks. The transfer lever

controls only H2, N and L4 and is laid out in a straight fore-aft line. Again, easy to operate and no fuss. H4 is selected separately by a button mounted on the right of the instrument console and hubs are manual freewheelers.

Interior Bundera appointments haven't changed all that much, though there is no clinometer binnacle as standard even on deluxe versions. Tie-down D-rings (four)

are now fitted to the rear cargo space which is small at 315 mm long, but can be expanded to 875 mm (1510 mm wide and 1130 mm high) by folding away the rear bench seat. The rear door lock is remote, controlled by a switch on the driver's side door, and all models now get small map pockets on each door. Outside, only the fitting of a non-slip edging to the side steps marks any real change — and, of course, the use of tame "Turbo" transfers on the door panels.

Generally there is little to complain about as far as finish or equipment is concerned. Build quality is superb and everything fits neatly and looks polished. Comfort is adequately catered for with supportive seats even if the range of adjustment is limited to fore-aft position, back tilt and steering column tilt. Deluxe models get more, including a hydraulic lumbar adjustment, but the diesel range consists of just one model — this one (an LX).

The one area where the Bundera falls down, and unfortunately it does so badly, is in the dynamics of the suspension and steering. Toyota appears determined to maintain the status quo with this vehicle for as long as possible — drawing out the rate of general improvements to extract the last drop of road testers' blood. The springs are too damned hard! I think I've sussed it out, though. I think the reason is actually quite simple.

There's no way Toyota could be said to be unable to devise a workable, compliant

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suspension. No way. What I think is really happening is that the marketing boys have decided that harsh suspension gives a prospective buyer an inflated impression of the vehicle's no-compromise, rough as guts, bulletproof feel. If you're looking at forking out great wads of money, the toughness of a vehicle is bound to be a major consideration. With hard suspension the Bundera feels unbreakable. Unfortunately it makes the Bundy difficult to control in some situations and severely limits its ability in others. And the truth of the matter is that softer, more compliant suspension would put that much less strain on the vehicle as a whole.

Diagonal ridges are a classic. Each spring is so hard that crossing one of these is almost enough to lift two wheels from the ground — even if the ridge is quite small. The available travel is just not usable — and that's a shame because otherwise the Bundera shows a lot of potential. With an aftermarket kit on board I'd be prepared to bet the improvement would be phenomenal and Toyota's shortest wheelbase model would go almost anywhere.

One thing I don't pretend to understand is the poor steering. On flat bitumen the precision is just adequate, but throw in a few dips and both roll and bump steer enter the picture — this in spite of a new front stabilizer bar. Unfortunately, I don't know of a great many four-wheelers who seek out perfect roads. At least some of the steering inadequacy can be attributed to the poor suspension, but it is about time Toyota got its act together in this regard. Soon, we have been assured, the suspension will be fixed. One can only hope the necessary alterations to the steering come soon after, if not at the same time.

In most ways, however, the Bundera shows a good deal of thought for practical design. Off-roaders who consistently find themselves in difficult terrain will like the good approach and departure angles (33 and 29 degrees respectively) which don't depreciate greatly on the move and appreciate the way the bodywork has been kept well tucked in to avoid damage. Even the side steps are narrow and only likely to be bent in very rocky country.

Underneath, the sump of the diesel engine is held high and behind the front diff where it's virtually impossible for damage to occur. The transfer case is protected by both a large cross member and a wide plate that extends right across the chassis. There's virtually nothing that can be badly damaged underneath, with the possible exception of the front diff which forms the first line of defence if you drive over a particularly large rock. Ground clearance is only 215 mm here,

but the housing is off to the right so it is not only easy to avoid the rocks in the first place, but the angle between tyre and diff is fairly high. Nevertheless, inspection after a few days' testing showed it had been grounded on dirt a number of times.

The front bumper design is such that fitting a winch is simple. There are already mount holes and sufficient space between the radiator grille and the bar. At the rear, the bumper is a step type and appears quite strong. Having the spare wheel carried on the rear door is another good move — you can get at it even in mud without becoming covered in the stuff. Don't like the front tow rings, though: not overly robust and angled in such a way that using all of your approach angle will probably rip them backwards.

There is no doubt that Toyota has come up with a winner in its turbo diesel engine. The adoption of forced induction may have been a long time coming, but the wait has been worth it. For Bundera fans, the spin-off is that now there is, for the first time, a more fuel-frugal diesel version as a choice alongside the three petrol models. With its 90 litre tank and fuel economy that worked out to an average 12 litres/100 km on this test (including some pretty demanding off-road work), you'll get at least 750 km between fill ups — and with diesel fuel, filling up won't cost an arm and a leg either.

It seems incredible that a manufacturer with a 24-model 4WD range could come up with a new model that makes sense. Yet, surprisingly, that's exactly what the diesels have done for Toyota.

MID WHEELBASE

While Toyota's Bundera is only now getting its first taste of diesel power, the middle of the road MWB 73 Series 'Cruiser is a comparative veteran, having been endowed with the gutsy slogging power of the 3B 3.4 litre since its introduction at the beginning of 1985. With turbo power however, and not a few changes to the internals of the engine itself, the 3B has been transformed into the 13B-T — a slugger which not only boasts an increase of torque in the region of 32 per cent, but a power boost of a massive 38 per cent.

Unlike the Bundera's 2L-T, the MWB turbo boasts direct injection of the fuel charge — a system already adopted on the 13B derivative which was already available on Dyna 200 automatic and Dyna 300s. When direct injection was first introduced on these powerplants, Toyota

naturally redesigned and strengthened the 3.4 litre diesel, but the subsequent addition of turbocharging has led to even further changes.

At the top, a new cylinder head has been designed, incorporating materials which have better heat resistance. Also, where the direct injection on the 13B was felt adequate for the normally aspirated engine, new multi-hole nozzles which better withstand the high pressures and produce better fuel atomisation have been adopted for the 13B-T. These nozzles have been matched by swirl-type inlet ports and curved valve seats to increase combustion turbulence and, hence, fuel economy and efficiency.



Again, fibre-reinforced metal has been used in the piston construction for greater cooling as well as heat and wear resistance. Piston strength has also been upped at the skirt area by using integral struts inside — a feature now shared with both normally aspirated powerplants.

Several other mechanical changes have been made, among them such things as strengthened conrods and a redesign of the piston pin boss for increased rigidity, but perhaps the most important among them is the lubrication and cooling system redesign. A new, high volume trochoidal oil pump increases flow rate in the fully pressurised system, and feeds oil through an oil cooler which is in turn cooled by the vehicle's water cooling system. "Water cooled" oil from the engine's main supply is also used to lubricate and cool the injector pump and the critical full-floating bearings in the turbine of the turbocharger itself.

These last modifications are aimed at maintaining a workable temperature under the harsh conditions encountered in pressure-fed engines and provide greater protection against failure.

Instead of the more usual glow plug system of preheating, the 13B-T uses an intake heater system. In pre-heat cycle, this involves heating a grid to red heat for a maximum of 20 seconds whenever engine coolant temperature is below 2.5 degrees C. Once the engine is running, or in conditions where ambient temperature is higher (most of the time), a second cycle comes into play, warming the same grid for a maximum of 70 seconds and

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cutting out as soon as engine temperature exceeds 10 degrees C.

As with the Bundera (which uses glow plugs), starting is almost instantaneous and is accompanied by very little white smoke. During our testing the temperature never dropped low enough for the pre-heat cycle to come into operation, so at no stage did the dash-mounted lamp illuminate. There is also an inlet constrictor mechanism incorporated in the inlet tract — a mechanism which, when the engine is switched off, cuts off the air supply, thereby ensuring that the engine stops promptly.

pockets on the front doors, left footrests on autos, thicker carpet, remote rear door lock, multi-function digital clock and, of course, "turbo" insignia on the rear, grille and door sides.

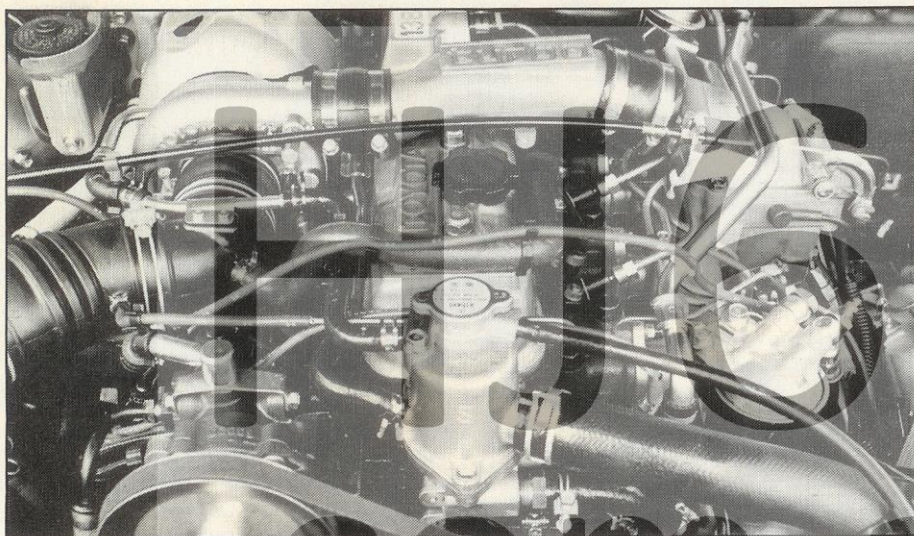
You still get electric front windows and twin front suspension seats and the steering column is tilt-adjustable.

Our MWB had the misfortune to arrive on the same week of our intended coverage of the Victoria Police 4WD School, so as well as the normal, thorough testing procedure, it also had to undergo some pretty stringent trials with the police. As you'll see by the separate story on that

In fact, the only complaints I have about the auto are comparatively minor. Engine braking on steep slopes only really comes into play once you've reached walking speed — too fast under some conditions, so the hand and foot brake need to be juggled. On the road, though the transmission doesn't sap too much power, it still soaks up a little and the 13B-T's 91 kW is hardly excessive, so acceleration doesn't show any enormous benefit over a manual, normally aspirated 3B. Top speed on the flat is approximately 135 to 140 kmh.

Nevertheless, it has to be admitted that the MWB was a breeze to drive under any conditions and it changed my ideas about autos. The power assisted recirculating ball steering had just the right weight to make it feel secure without being at all tiring. One-handed manoeuvring in tight conditions while fiddling with the gear-shift or handbrake with the other hand were the norm.

The brakes were also good, managing to keep speed to a reasonable level even on long down grades, where they were constantly applied, without overheating. Because of the powerful transmission, coming to a complete stop from walking pace takes more effort than you might expect, but the power disc/drum combination scrubs off speed readily and without fuss — the only side effect being a tendency for the steering to become a bit vague under heavy application.



With the water cooled turbo, Toyota has managed to boost the power and torque figures for the 3.4 litre diesel to a healthy 91 kW at 3400 rpm, with 285 Nm of torque available as low as 2000 rpm — that's what makes the diesel so good in the rough. Torque doesn't drop below 240 Nm anywhere between 1500 and 3500 rpm.

The vehicle we had to test was the FRP topped LX, only two versions being available: an automatic and a manual. Ours was the auto, which boasts four speeds against the manual's five. In spite of the extra power, the turbos retain the same gearbox, transfer case and differential ratios as the normally aspirated versions — diesel or petrol. All models, including the autos, share a 1.963 reduction in the transfer and 4.111:1 diffs, though LX models get a limited slip diff as standard.

It is not just the mechanical specification of the MWB that has been changed, however. The interior trim levels have been adjusted on the LX range with the addition of four tie-down D-rings in the rear, the fitting of three child restraint anchorage points to the rear roll bar, new seats with "turbo" across the face (thankfully in fairly small type), head restraints for the rear bench (which folds forward for increased luggage space), small



drive in next issue, the fact that I was faced with an automatic transmission for the duration caused me some trepidation. How would it hold up under severe conditions, such as steep down-hills with huge washaways, or inclines with rock ledges?

As it turned out, the auto managed surprisingly well, and there were even instances where it proved an advantage.

Suspension at both ends is by semi elliptic leaf spring and hydraulic shock absorbers with a stabilizer bar controlling the front, but both spring and damping rates are still too harsh. The ride from the 2600 mm wheelbase 'Cruiser is, understandably, much better than that offered by the Bundera's 2310 mm, but initial reaction to ripples and smaller bumps is too hard and allows the wheels to bounce

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on corrugations. Further into the travel, the springs are too soft with a final rate that allowed the rear end to bottom out on a number of occasions during rock and washaway work. There's even a black crescent of tyre rubber on the body wall inside one of the rear wheel wells.

But for all that, the MWB is still a capable performer. Approach and departure angles of 37 and 31 degrees respectively allow you to tackle some quite alarming terrain, and a minimum static ground clearance of 230 mm keeps the diffs off the deck in all but exceptional circumstances. The one area where the MWB 'Cruiser might be lacking is in rampover, where the large protection plate beneath the rear of the transfer case hangs low between the wheels.

There were some annoying little glitches inside, too — like seat belt buckles which rattled incessantly when not in use throughout our over-1000 km test, and a deep, rumbling drone that seemed to resonate throughout the cabin at some speeds. Direct engine noise, while certainly not quiet, is at least acceptably controlled, but at anything over 80 km/h, don't even think of opening a window or quarter vent. The resulting air turbulence is loud to say the least.

Dust sealing is excellent and it was possible to follow right behind another vehicle without being choked in the stuff. The only problem is that dust settles in the exterior vent entrance so that once you open the air system again, you get it all. Still, most 4x4s suffer this problem and the 'Cruiser is no worse than many.

According to the PR material, the LX Turbo is a six-seater. I wonder where you're supposed to put them? As far as I can figure it's a five-seater at most, with one in each of the front buckets and three across the rear bench. Everyone except the centre rear passenger gets an inertia

reel seatbelt but, despite Toyota claims that the inertia reel mechanism has been modified to reduce a tendency to tighten on corrugated roads, they still do. One passenger complained bitterly about it, even with the suspension seat locked down. It's a common complaint, and one has to realise that there are limitations to the applicability of inertia reels in 4WDs. You can't, for instance, put them back on if you unbuckle on any kind of slope.

Tyres are Bridgestone's RV Majors on 7.0JJ-15 rims, and although not entirely suited to muddy ground, they work exceptionally well on dry and hard packed surfaces. The wide rubber gives a sure footing and improves the ride on small ruts and washaways and gives good grip on rocks.

The one overriding impression that remains after the test is that the MWB Land Cruiser is really still a worker, in the same mould as earlier 'Cruisers, but with luxury fittings bolted on. The air conditioning, power windows, suspension seats and well finished interior trim almost feel out of place on a vehicle with such harsh suspension. In spite of the "luxury" tag Toyota has given it, the MWB feels too tough to be comfortable with such a designation. Sure, you get plenty of non-essential extras, but you don't get a great deal of comfort.

Fuel costs are surprisingly frugal, the figures here not giving a true indication of the engine's ability. Even though nearly 50 per cent of the test mileage was clocked up either in low gears or in low range on demanding tracks, the automatic still managed to return 13 litres/100 km. Our recent test of a *manual* Patrol turbo diesel (which admittedly provided more on-road performance) returned only 13.4 litres/100 km. It would be reasonable to assume that a manual MWB 'Cruiser Turbo should be able to better

12 litres/100 km — not bad at all. Even in auto form the standard 90 litre tank will give a range exceeding 700 km, making fill-ups rare enough not to break the bank.

As with the Bundera, a little work on the suspension and steering (which is certainly not dreadful, though it could be better) would immensely improve this beast. Softer initial rates and a harder final rate would give the MWB a more comfortable ride and prevent, at the same time, the sort of bottoming we encountered. A good one, but it can still be better. Bring on next year's model — hopefully it will have the suspension package the machine deserves.

60 SERIES

Of Toyota's three new turbo engines, the 12H-T which powered our test 60 Series long wheelbase 'Cruiser was by far the most impressive. Based on the 2H normally aspirated powerplant, the 12H-T puts out a massive 103 kW at 3500 rpm and backs it up with 322 Nm at a mere 1800 rpm. That's an increase in power of 30 per cent and torque of 31 per cent.

As with the Bundera and the MWB, these huge increases have come, not just with the fitting of a turbine induction system, but with fairly thorough redesign of the engine componentry itself. Many of the changes made to the MWB's 13B-T are similar to those which have changed the 2H into the 12H-T so I won't go into detail, but again, much of the engine strengthening has flowed back to the normally aspirated engine.

The cylinder block, valve gear, cylinder head, pistons, connecting rods, crankshaft, camshaft, lubrication and cooling system have all received modification to cope with the extra loads, and the changes are quite complex. Even such things as cylinder rings and valve seat materials have been changed and, downstream from the engine itself, the clutch clamping pressure has been increased and the H55F five-speed manual transmission beefed up with a new input shaft bearing and second gear.

Due to the direct injection system used, the 12H-T shares a similar pre-heat system to the MWB range, dispensing with glow plugs in favor of a heater grid in the inlet tract. For some reason our LWB blew a bit more white smoke on start-up than did the MWB automatic, but starting was always instantaneous and warm-up was brief enough to drive off pretty well immediately. Cold, the diesel rattle is quite noticeable — a natural result of the



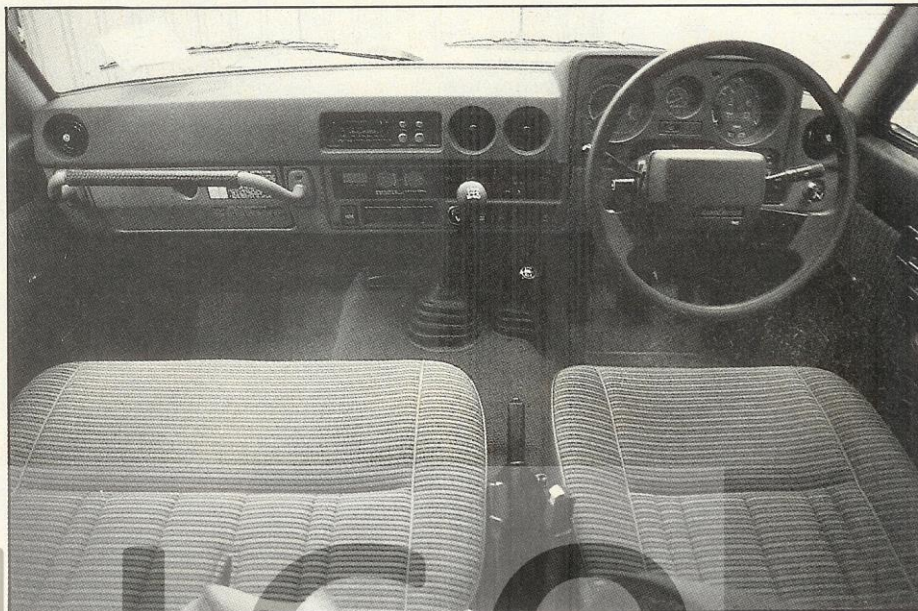
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direct injection which utilises a combustion chamber inside the piston crown rather than the cylinder head. Nevertheless, once mobile on a warm engine the noise dies away to a rumble, but never completely disappears.

The 60 Series Deluxe G Wagon (Std roof) was the version we had to test, and it was by far the most enjoyable of the three turbos tested here. Aside from the obvious benefits of having increased space, the tremendous urge from the 4.0 litre engine endowed the Wagon with as much acceleration and speed as most petrol powered rigs and more than some. Where I had become used to being left well behind by the normal flow of the traffic, I was suddenly having to temper the use of my right foot: heavy application on damp roads (and it *always* rains when I test vehicles) can see the rear tyres spinning with surprising ease.

Throughout the range, which provides good pulling power all the way from 1000 rpm to redline at 4000 rpm, response is smooth and powerful, and the only complaint worth levelling at the engine/transmission package is the amount of driveline wind-up due to dampers and such in the transmission. In first gear low, or even second, any jerkiness in throttle application (such as is unavoidable on really bumpy surfaces at low speeds) causes the engine to load and unload the transmission in succession, jerking the vehicle quite badly. Other than that, though, the engine is a dream and will happily plod along all day in low-low or cruise on the highway at 130 or even 140 kmh!

Of the three 'Cruisers we tested this month, the LWB 60 Series was by far the best suspended, the gradings going from



quite poor on the Bundara through acceptable on the MWB to quite good on the 60. It's not particularly compliant like, for instance, the Pajero Superwagon, but nor is it overly harsh. Wheel travel is a little limited, but not enough to seriously compromise the effectiveness of the vehicle. On dirt road corrugations the Wagon bounced around a bit, but not to the extent of Toyota's smaller vehicles and there was no time when it felt as though I was losing control.

On flatter dirt the LWB was actually fun to drive, aided by that excellent spread of power and steering which, while tending towards understeer in 2WD, smooths out nicely to become almost neutral in 4WD. In fact the steering has been broadly criticised in the past, but aside from some vagueness at speed on sweepers, I found

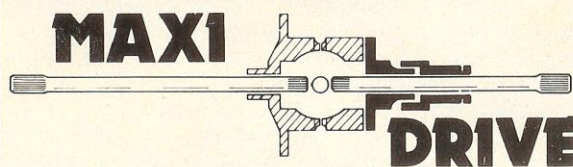
it more than adequate. I guess it's a matter of priorities, but a little vagueness under those conditions is far preferable to me than the sort of out-of-control wandering and bouncing suffered by some.

Interior appointments are quite thorough, though the front seating consists of only an ordinary bucket for the driver and a twin bench for two front passengers. The centre seating now boasts two head restraints as well as child restraint anchorage points on the rear of the outboard positions. In line with all 'Cruisers now, four tie-down anchorage points for luggage storage are fitted to the rear compartment, making the securing of loads that much simpler.

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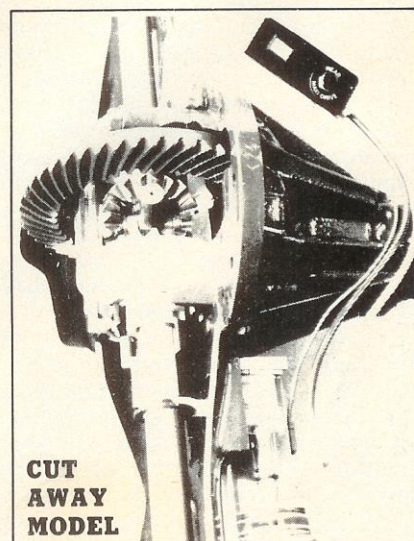
FEATURING:

- * **VACUUM OPERATED, DRIVER CONTROLLED**
- * **ENGAGE ON THE MOVE**
- * **SIX GEAR CARRIER**
- * **30% LARGER AXLES**

Designed — Manufactured and Marketed by Mal Story, Proprietor of
KEY FOUR WHEEL DRIVE

For Further Information Write or Phone:
Lot 9, Gilston Road
Nerang, Qld 4211 (075) 58 1756

Maxi Drive. Also available for Salisbury 8HA differential.



CUT AWAY MODEL

encompassing speedo, tacho (with boost LED and warning lamp), fuel, oil pressure, temperature and charge level dials make things easy. Visibility is almost perfect aside from the usual rearward problems associated with all wagons, and the new outside mirrors are larger and less prone to being knocked out of alignment by passing bushes. They're an odd shape, though, being narrower at the top than the bottom — a shape which doesn't assist with seeing directly behind.

Everything is within easy reach and the gear lever, though a little stiff, comes readily to hand and provides crisp changes without baulking at all. At no time did I have difficulty picking up the gear I wanted and, once selected, the engine does the rest. No complaints about the ratios either: well spaced and low enough in low range for the most arduous work while being almost spot on for road work in high range.

I had reason to be thankful for the progressive brakes, too. During one session which I had devoted to photography I came across some people who'd been stranded on the side of a mountain since the previous day. It had been raining heavily ever since and there just wasn't enough traction for me to pull them out. It's a long and rather embarrassing story, but suffice to say that I got stuck as well and, after several of us worked together to get me unstuck, I had a lot of "fun" slithering sideways down a sloping track with a sheer drop on one side. If the brakes had been grabby, or lacked feel at all, I wouldn't be writing this. On the road, the brakes work just as well, pulling the Wagon's 2760 kg weight to a stop smoothly and in a straight line.

The one thing I was not impressed with as a result of the above experience is the

tyres' ability in mud. Narrow, high side-walled "Road Grippers" might be fine on rocks where puncture protection is important, but they have little self-cleaning property in the wet.

With the sixteen-inch wheels that come on this model (Saharas get 15s), all the important underbody angles and heights work out well. Approach angle is 39 degrees with a 22 degree departure and 225 mm of ground clearance under the diffs. Under the wet conditions, the test was restricted to the less radical terrain of the lower ranges east of Melbourne, but before the rain set in the Cruiser easily handled a few short climbs in the 30 degree range.

It's worth noting that Toyota has made a few changes to the chassis and rear suspension arrangement in order to accommodate a diff lock which is an option on the workhorse Standard Wagon. That change, involving a relocation of the rear shocks and the insertion of a bend in the fourth chassis cross member, means that diff locks can be fitted to both Deluxe and Sahara models in the future.

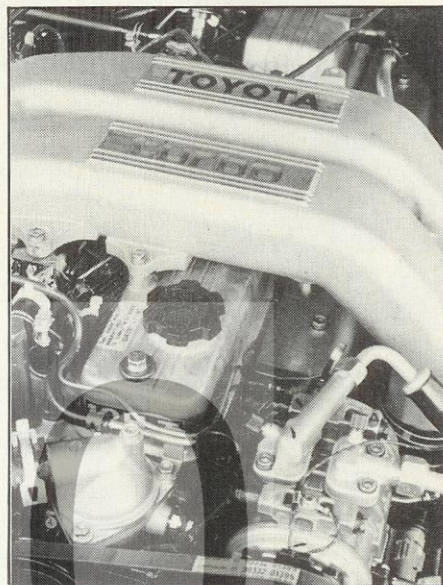
As a six-seater, rather than the Sahara's eight, the 60 Series offers more than adequate luggage space. The fully carpeted rear compartment measures a healthy 965 mm long with the seat in position, or 1755 when folded forward. Width is 1520 mm and the roof height is 1025 mm, which should be plenty for all the camping gear you'll need.

But perhaps the area where the turbo will see a lot of service is as a tow vehicle. With such a strong motor, trailer boats and so forth will be easy work, requiring only some stiffening to the rear suspension for the extra weight.

Like the other Cruisers, it comes with a standard 90 litre tank and, returning better

than 13 litres/100 km, should easily get you 690 km under normal use. In more strenuous conditions we managed to average 13.6 litres/100 km — a figure that would be easily bettered.

As supplied, our Stationwagon Deluxe Turbo Diesel sells for a recommended



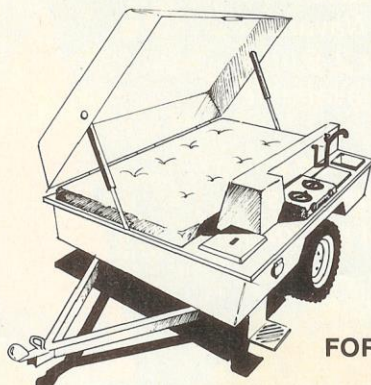
retail price of \$29,243, with the auto version coming in at about \$1500 dearer. The Auto MWB Turbo Diesel sells for \$27,609.40 with the manual \$26,040.08 and the sole diesel Bundera, the LX Hardtop Turbo, asking \$18,567.

Toyota has done a good job in converting its diesels to turbo induction. It is indicative of the care with which they've gone about it that all three are at least competitive with other offerings on the market. In the case of the LWB's 12H-T, Toyota may well have built the best turbo diesel you can buy.

COUNTRYWIDE OFF-ROAD CAMPER

FEATURES

- 65 L ICE BOX
- 80 L WATER TANK
- 4.5 KG GAS BOTTLE
- DOUBLE MATTRESS
- 2 BURNER STOVE
- SINK
- ANNEX



- FULL FIBREGLASS CONSTRUCTION
- STRONG TUBE STEEL CHASSIS
- ACCOMMODATION — 2 ON CAMPER 4 IN ANNEX
- SEALED AGAINST RAIN AND DUST FOR PROTECTION OF CONTENTS
- FULL FLOATING CAPABILITY
- SMALL BOAT STOWAGE ON TOP
- A LIST OF OPTIONS THAT INCLUDE: A REFRIGERATED ICE BOX, FUEL CARRIER, SPARE WHEEL

FOR DETAILED INFORMATION CONTACT:

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KEN JAGO YACHTS P/L
99 White St, Mordialloc
Victoria 3199