

Pushing the different suspensions over uphill corrugations was revealing. The standard LandCruiser (above left) misbehaved, the TJM LandCruiser (above right) didn't.

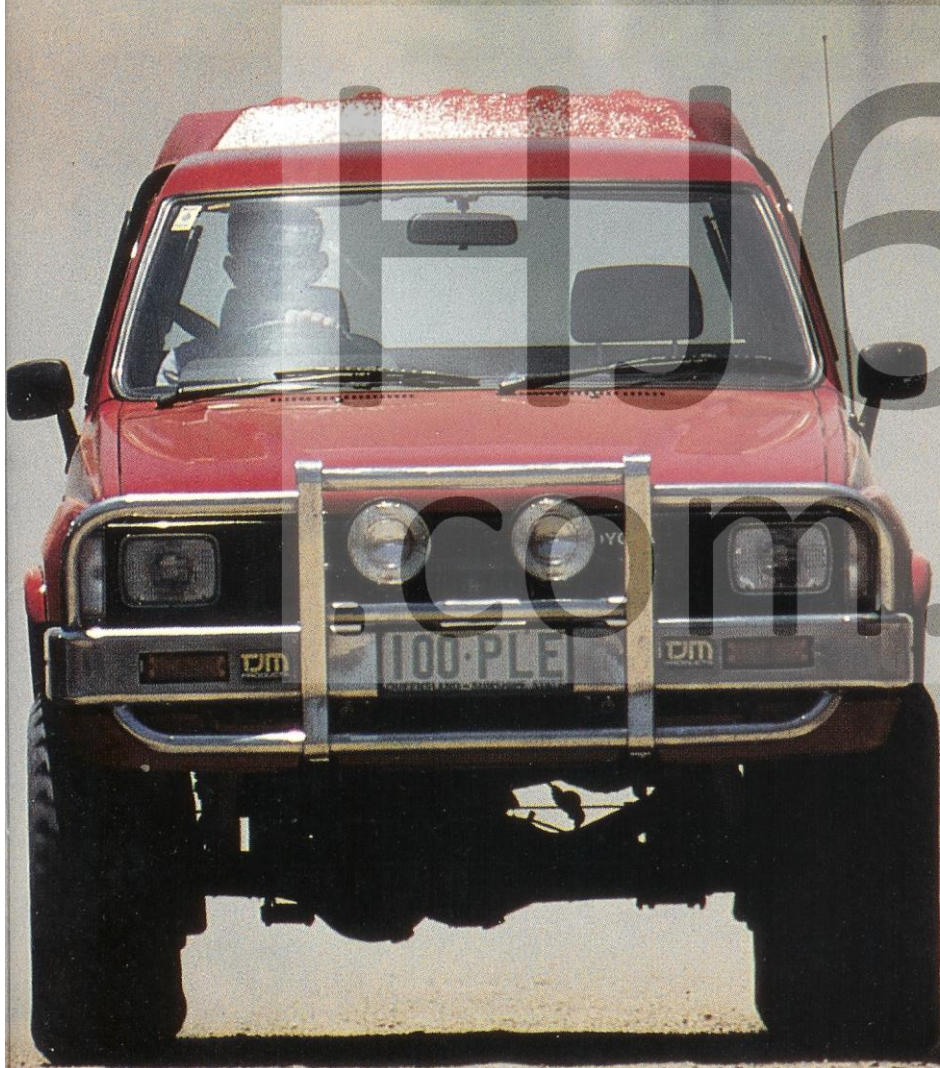


SPECIAL 2 X 2 COMPARO OF 4 X 4 HI-LIFTS

HI-JACKED!

Special springs and big bore shocks lift stock suspension systems to new heights of clearance and on-off road performance. We get behind the wheel of a brace of jacked-up Toyotas and compare them with the standard items for an uplifting experience.

STORY AND PHOTOS BY PETE CARDIGAN.



UNLESS you're into Vitamin B deficiency, snakebite, malaria or an OD on exhaustion, you wouldn't sign up for something like the Camel Trophy. But there are desperate men out there — prepared to tackle every kind of drastic off-road challenge from a Camel Trophy to a personal assault on their own regional Everest. Considering that a bizarre adventure like the Trophy is perpetuated on the durability of a stock standard Land Rover, the manufacturer deserves full credit. It also opens to question the argument for changing the original suspension spec.

But there are many people who would sacrifice originality, or expect more than original equipment durability from their suspension systems.

Their reasons are as broad as the motoring scope of this big bronzed country . . . ranging from improved ride quality, to greater suspension travel for ultimate off-roading exercises.

It is claimed by the aftermarket suspension smarties that 4WD makers build limited travel into their suspensions because they'll last longer that way. Given the abuse some cross-country vehicles get, that decision is understandable.

But in fairness, a great deal is expected of the original equipment manufacturer. The manufacturer has to build a product that will be accepted on a global market. It has no opportunity to custom-build suspensions for individual

applications or markets because, applied on its production scale, the cost of custom-building would be prohibitive.

In the case of the Japanese manufacturers, they're opposed even to the principle of custom engineering. If they can't be made by the zillions, they don't want to know.

This confluence of events makes a tidy little business for the best aftermarket suppliers in Australia. Some, like Old Man Emu's John Chapman, believe they've developed better suspensions than the manufacturers, and after a great deal of experimentation and development, some are now willing to stuff their money where their mouths are.

Old Man Emu has been in the 'fixit' business for a long time and as John Chapman likes to point out, OME has plenty of experience confirming what doesn't work. Having traded the barrister's wig and robe for the fascination of hydraulics and rebound rates, John Chapman has had bulk trouble getting the kind of springs he wants from some Australian spring makers.

Too many of them pay too little attention to quality control and don't have the equipment needed to produce consistently good springs, he says.

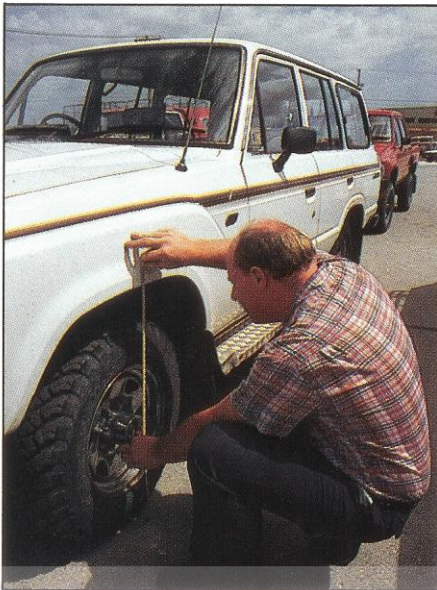
"Springs can be a big drama," says Chapman, "and it has been singularly disappointing to me that most manufacturers I've dealt with know so little about their product, and make springs that vary so much in their overall behaviour.

"Designing and building springs is an exact science — or should be — yet many of our manufacturers are turning out leaf springs that are not much different to cart springs; bent over a brick and the same as they were 200 years ago.

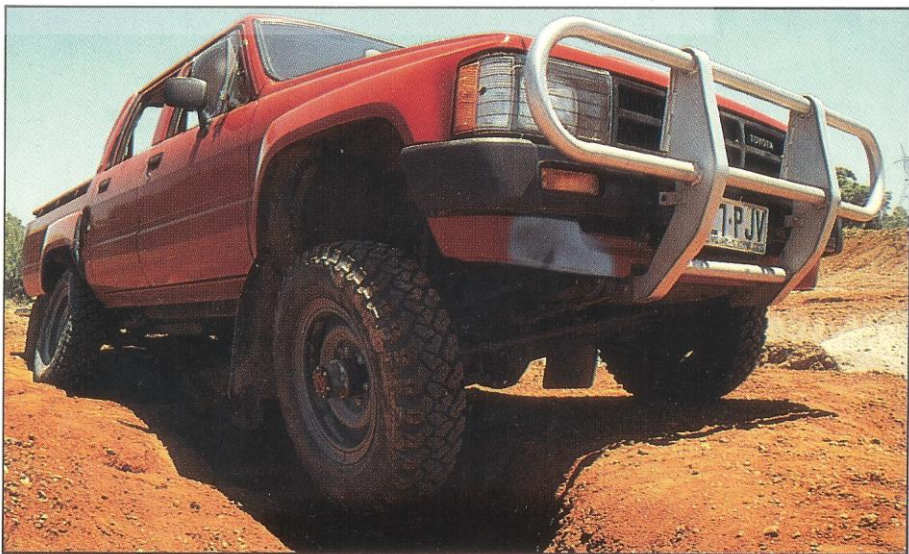
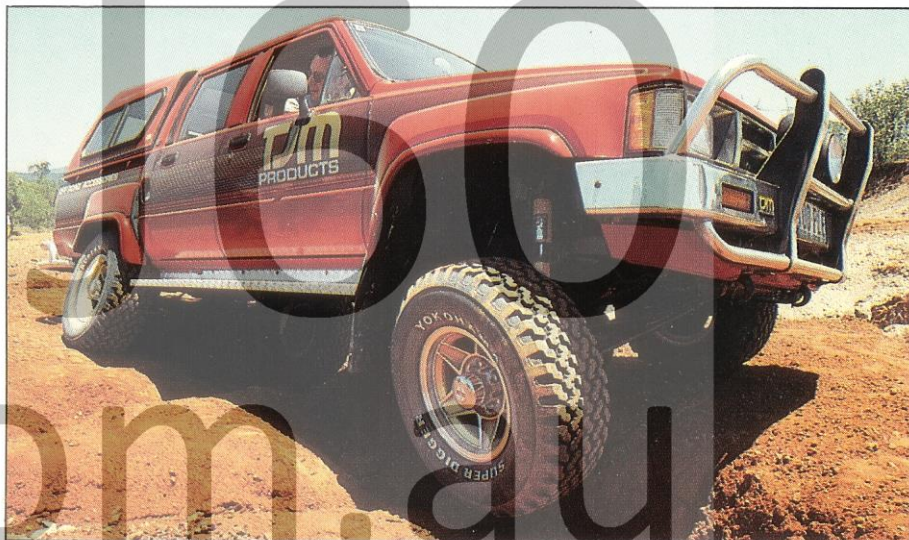
Disillusionment with spring makers led John Chapman to the front door of National Springs, wherein a more encouraging attitude was found. Together with National Spring engineer, Rogan Foots, Chapman developed a leaf spring system designed for Toyota's LandCruiser and HiLux.

Chapman says the system is the best aftermarket suspension available anywhere, and a perfect match for OME's new 18-mm Fat Gas shock absorber.

Not a man loathe to promote his own creations, Chapman says the new Supreme Seven Star springs have every design/production advantage he could give them — the whole heart attack, in fact.



Measuring up the difference in ride height between standard (left) and modified (right) LandCruisers.



TJM/OME-kitted machine (top) went closer to putting its right-hand front wheel on the deck than standard HiLux (bottom) in this extreme situation.



Modified LandCruiser (left) beats the standard item (right) hands down in this practical belly angle clearance contest.

Like most leaf springs, the OME pack is made of silicone manganese spring steel. In these springs, though, the tension (uppermost) side of the spring is diamond cut and tapered to reduce interleaf tip pressure. Polyurethane and antifriction pads further reduce interleaf friction, while upper spring surfaces have been shot peened, which means some little bod fired zillions of tiny ball-bearings at the spring to compress their surface molecules and increase spring durability.

The springs have also undergone scragging, an unpleasant word which means the natural camber-curvature imposed on the spring during manufacture is cancelled.

The springs have also been negatively stressed. That's a term engineers use to describe the technique which stretches the surface fibres of the springs, further increasing durability.

As another method of reducing

friction between each leaf, each one is coated in a graphite lubricant. **All very well but does it work?** Having done our theoretical homework, we cast about for something to evaluate in practical terms.

TJM, a huge aftermarket equipment supplier based in Brisbane is a leading distributor of OME products. They had just acquired a new model HJ60 LandCruiser Wagon and the latest HiLux and fitted the vehicles with OME suspension. They were prepared to make the vehicles available for "any kind of testing". Bewdy.

To ensure we had the appropriate metre-stick for evaluation we arranged a stock standard version each vehicle. With a quad of cars on standby for our evaluation, we winged it to the sunny north.

The TJM HJ60 wore BF Goodrich Mud Terrain T/A 32 x 11.50 tyres front and rear while the standard vehicle had the original Dunlop SP Road Grippers. The TJM HiLux had Yokohama 31 x 10.50 tyres all round and the standard HiLux wore its original 205R16SP Road Grippers.

TJM had fitted the new 18-shocks to the front of the modified vehicles but retained the older 15-mm OME shocks on the rear. (When 18-mm units became more readily available they will replace the 15-mm units.)

The first thing we did, after having a good poke around the trick trucks, was to head off to a foul little back road, hidden behind the PGH brick quarry near Strathpine. I say "foul" because the track had a few cute obstacles, including a 40-cm deep trench smack-dab in the middle, more or less after the washaway which more or less followed the giantest pothole of all time, just after a motocross set of whoop-de-doo.

We climbed into the standard HJ60 first. Steve Molinhauer was taking this whole affair seriously and immediately aimed the LandCruiser at the first series of potholes, whereupon the poor Cruiser nose-dived into the first hole, causing the shock absorbers to complain bitterly.

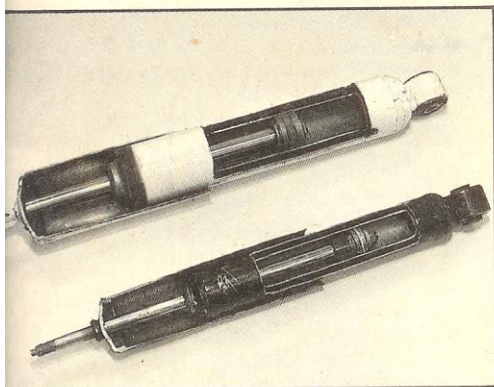
Further down the track the performance was repeated, and for a moment I thought of whispering "goodbye Margaret" as a crazed Molinhauer drove straight at the deep washaway. We lurched this way and we lurched that way and even as I lurched I found time to praise Toyota for making a vehicle that would take such a hammering. Then on the way back I got in and did the same thing.

At the top of the track we climbed into the TJM vehicles. We had driven down the foul little track between 40 and 50 km/h in the standard vehicles, not counting out airspeed. We descended in the TJM HJ60 between 60 and 70 km/h, with much less drama.

It was almost like comparing two vehicles of a different make. Where the standard vehicles suspension simply wasn't capable of handling the combination of speed and rough road without violent reaction, the TJMer gave a far superior ride, was able to be driven faster with safety, and lacked the standard vehicle's violent spring reaction on the roughest sections.

Nor did the modified LandCruiser demonstrate bump-steer over the corrugations, or shock absorber bottom-out in the potholes.

The HiLux gave more of the same. Not one of my favourite machines on bad roads, the HiLux was a real handful at speed. Uncontrollable pitch reaction through the leaf springs made the ride uncomfortable to say the least. Down the track in the TJM HiLux the ride and handling were demonstrably superior.



OME's 18-mm shock absorber (top) compared with Toyota's 13-mm standard unit (bottom).

It should be pointed out that no one in his right mind would take that track at the speeds we did. We did it only to compare different suspensions under identical circumstances.

The TJM vehicles also began the evaluation with tyres that had inherent ride qualities superior to the standard equipment, and that must have at least partially contributed to the better ride of the OME-equipped vehicles, and their superior ground clearance.

Measuring it up

Fitting a genuine long travel suspension kit to any 4WD will alter the vehicle's attitude and its critical dimensions. The OME-equipped vehicles had better overall ground clearance, as our pictures clearly demonstrate.

We measured critical dimensions of the TJM and the standard Toyotas — unloaded, then loaded with 270 kg. The readings are more easily scanned than read:

Ground to top of wheel-arch clearance:

TJM HJ60 unloaded — Front 905 mm Rear 915 mm

Standard HJ60 unloaded — Front 838 mm Rear 800 mm

Standard HiLux unloaded — Front 915 mm Rear 870 mm

TJM HiLux unloaded — Front 975 mm Rear 935 mm

The implication in these measurements is obvious. The OME-equipped vehicles start off with better ground clearance front and rear — 115 mm higher at the rear in the case of the HJ60 wagon, and of course this translates into better approach and departure angles.

Wheel arch clearance with 270 kg in the back revealed more interesting stuff, particularly for off-roaders who tow campervans and boats, or who like to take their vehicle's load carrying capacity to the limit.

Wheel arch clearance on the back of the standard HJ60 wagon was 780 mm; the TJM wagon had a 880 mm clearance, about four inches more. Same thing showed up with the two HiLuxes when loaded. The original vehicle had a rear wheel-arch clearance of 870 mm; the TJM truck had a rear wheel-arch clearance of 905 mm.

The better rear ground clearance on loaded TJM vehicles clearly holds the potential for more stable towing and gross vehicle mass operation as the HJ60's typical spring sag under load is eliminated. The large oil volume in the 18-mm-shafted OME shock absorbers also increases ride comfort under load because the OMEs retain

performance levels in their "soft" stage longer than the smaller capacity 13-mm-shafted Toyota shocks.

The distance between the top of the axle and the bumpstop rubber is considered critical because it indicates the amount of upward movement the springs will allow the axle.

On the standard HJ60 the distance from the top of the front axle to the bumpstop rubber was 45 mm, and on the TJM vehicle, 93 mm. The distance between the top of the rear axle and the bumpstop rubber on the standard HJ60 was 65 mm, and between the top of the rear axle and the bumpstop rubber on the TJM vehicle, 160 mm.

Not taking into account how much the bumpstop rubber might compress under the axle, the rear of the TJM truck had about four inches more upward axle movement than the standard vehicle, which means four inches more useful wheel travel.

What does it cost and can you afford it?

No good suspension modification is cheap. Development costs have to be amortised somehow, and the production procedure itself is expensive.

The OME equipment is not cheap, either, and whether you think it's worth it may eventually be influenced by your vehicle's regular vocation. If you're the type who travels endless kilometres on rural dirt track then the OME long travel suspension kit will make life a lot easier and heaps more comfortable. It will also improve the vehicle's handling on blacktop, which is where most private cross-country vehicles spend their time.

The Supreme Seven Star springs front and rear of an HJ60 wagon will set you back about \$700, not including sales tax (about 20 per cent) or the price of fitment which could be as high as \$150. The 10-mm gas shocks must be fitted at the same time so the fitment charge includes the shocks. Oh yes, the shocks cost \$276 for four, and you can add 20 per cent to that as sales tax, compliments of Pee Keating.

The same set-up on a HiLux is slightly cheaper because the HiLux spring pack is lighter and contains fewer springs. Springs all-round will cost about \$620, plus tax and fitment. The shock absorbers cost the same.

If you have the money to spend on your 4WD it could be argued that just over \$1000 invested in suspension improvement is more wisely spent than bulk bucks blown on a PTO winch, multistorey roof rack or flying doctor radio.

Your Zodiac fun starts here.

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Mona Vale (02) 99-1368

Inflatable Boat Warehouse
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Leichhardt (02) 568-3772

Ken Brown Inflatables
113 Parramatta Road,
Camperdown (02) 517 1244

A.C.T.:

Wild Country Traders
59 Woolley Street,
Dickson (062) 47-4539

Victoria:

Inflatacraft
102 St Kilda Road,
St Kilda (03) 534-7004

Queensland:

Cairns Yacht Shop
7 Redden Street,
Portsmith (070) 51-2304

C & T Marine
83 Hanson Street,
Gladstone (079) 72-3555

Inflatable Boat Centre
222 Wishart Road,
Wishart (07) 343-1122

Marine Control Systems
111 Queen Street,
Southport (075) 31-3638

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Cairns (070) 51-1667

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South Townsville (077) 71-4288

South Australia:

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73 Beachboro Road,
Bayswater (09) 271-7245

McCorkills
108 Marine Terrace,
Fremantle (09) 335-4800

Tropical Traders
39 Queen Victoria Street,
Fremantle (09) 335-5733

Tasmania:

Gravelly Beach Marine
2-4 Main Road,
Gravelly Beach (003) 94-4271

Northern Territory:

Nautical Supplies
5268 Frances Bay Drive,
Dinah Beach (089) 81-6651

New Zealand:

Zodiac Inflatable Boats
Box 2109,
Auckland 79-5157

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Siule Group of Companies
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