

HOTTOPIC ALL-TERRAIN TYRES



ike the name badge on your 4x4, your choice of tyres could generate some spirited discussion around the campfire. For decades, tyre manufacturers have been trying to find the golden

mean between off-road prowess and performance on tar. This has led to the development of so-called all-terrain (AT) tyres, which have become popular as original equipment (OE), in particular for 4x4 bakkies and their SUV derivatives.

It's not easy to get a good overall sense of everything that's available on the market, so we decided to compare 15 tyre brands and let the figures do the talking.

The results confirmed some things we had suspected but also held a number of surprises.

11 THE VEHICLE

The choice of tyre size was decided by the test vehicle – in this instance the popular Toyota Hilux, by far the best-selling bakkie in South Africa. Toyota SA kindly made available a double cab Hilux 3.0 D4-D 4x4 with a manual transmission, shod with 17-inch Bridgestone Dueler AT tyres (265/65R17) on 7J rims in standard trim. This size tyre is also original equipment on the Ford Ranger, whereas the Isuzu KB and the Nissan Navara have 17-inch rims but smaller tyres.



Change, inflate, measure, fit... 64 times. The tyre team operated like a well-oiled machine to ensure the completion of all 60 tests. Donovan Stanley of Klipbokkop (left front) and Brian Sadie from Tiger Wheel & Tyre (left) helped to fit all the rubber on our test Hilux.

2 THE TYRES

The tyre market in South Africa is growing rapidly – in volume as well as brand diversity. Whereas manufacturers such as Bridgestone, Goodyear, General Tire (Continental) and Sumitomo (Dunlop) have facilities here, a plethora of brands are imported through companies like TiAuto, SA Tyre, Stamford, Tubestone, Minty's and Lombard Tyres.

We finally received the correct type and size of tyre from 13 makes: Achilles, Continental, Falken, General Tire, Goodyear, Hankook, Kumho, Nankang, Pirelli, Toyo, Velocity, Windforce and Yokohama. And out of a total of 25 all-terrain tyres available locally, we eventually sourced 15.

Bridgestone South Africa did not want to participate, so we decided to use the Duelers on the Hilux test vehicle (having done fewer than 1 000 km) and informed the manufacturer accordingly. Michelin SA did not want to part of the tests either, so we decided to buy a set of BFGoodrich tyres, as we felt without them the test would not be representative.

Sumitomo, new owners of Dunlop in South Africa, wanted to participate but its consignment of Grandtrek AT 3s was not available in time. Dunlop offered us a set of AT 20s but we declined, as it is an 80/20 (asphalt/off-road) tyre. A pity, really, because we thought the AT 3 would be a strong contender.

Other makes we would have liked to have used were Apollo (not imported by Sumitomo any more), Firestone (the correct size not available), Federal (too old technology), Maxtrek (not offered), Hercules (not available) and Sumo (not available).

We also approached Maxxis, Cooper Tyres and Mickey Thompson (distributed by ATS Motorsport) for their Bravo, Discoverer A/T3 and Baja ATZ tyres, respectively, but besides problems to source correct sizes the distributors weren't interested. Their main contention was that the prescribed tyre pressures (more about this later) would not suit their sturdier tyres with three-ply sidewalls, even though the tests were more off-road-oriented.

3 THE VENUE

We decided on the Goodyear 4x4 Academy at Klipbokkop Mountain Reserve near Worcester as the test venue. Klipbokkop has been involved in tyre testing for years and its team, led by Gerhard Groenewald, know their way around the rubbery stuff. The terrain has an excellent mixture of tar, gravel, dirt, sand and rocky routes, making it ideal for our purposes.



Numbers and figures... Every run, every distance were carefully recorded. Gerhard Groenewald of Klipbokkop looks on while Ferdi de Vos checks numbers on his clipboard.

4 THE TEST PARAMETERS

The challenge of this type of off-road testing is to ensure measurability and repeatability. No prescribed testing procedures exist for off-road tests under non-standard, real-world conditions, and it took some time and effort to devise measurable tests with the help of the manufacturers and organisations in the tyre industry.

The most important consideration was that the off-road-oriented test terrain should imitate local conditions.

We finally settled on five tests: two braking tests (one on tar, one on gravel); two

sand tests (to measure traction and scaling ability); and a sidewall test (measuring how quickly the tyre will come off the rim).

We also considered a wet braking test, but decided the gravel braking test, which corresponds with wet braking to some degree, was more important within our testing context.

We also wanted a test on rocky terrain, but since all AT tyres have good grip on rocky surfaces and stones are easily dislodged when driven over continuously, we could not devise a measurable, repeatable test on the available terrain.

A handling test on a dirt track was also contemplated but quickly discarded. It was clear that even with continuous track maintenance, changing grip levels would make any measurable result impossible. (All we could really expect was a subjective opinion from our test driver.)

A mud test was also dropped because of the same problems with measurability and because we thought it would be more suitable for a mud-terrain (MT) tyre test.

5 OUR APPROACH

Strict rules and regulations were imposed to ensure measurable and repeatable tests – and therefore the integrity of the results. To ensure maximum control, the following pre-event procedures were followed:

- To prevent the supply of any specially prepared tyres, most sets were procured through the Tiger Wheel & Tyre network.
- Where not possible (as some tyres were on special order) the sets were inspected by representatives of other tyre manufacturers as well as a technical committee.
- Fitted tyres (such as the Bridgestones)
 were taken off the rims and mounted
 again to seat. After fitting, all the tyres
 were inflated to 3 bar and left to seat for
 about a day.
- All fitting was done by technicians from Tiger Wheel &Tyre on the same machine.

6 CONTROL MEASURES

For the tests, the following control measures were imposed:

- A control tyre (Goodyear Wrangler HP All Weather) was used, as well as a control vehicle (Toyota Hilux) of similar specifications as the test vehicle.
- An HP spec tyre (similar to Highway Terrain) was specifically chosen to ensure no AT tyre would gain an advantage.
- Control runs were completed before



Rims reloaded. Brian Sadie and Richard Docking from Tiger Wheel & Tyre fitted all the tyres on rims with the same machine.

every test to establish a reference point and repeated during testing to reconfirm this point.

- For the tar braking test, each set was warmed up (driven) beforehand and a practice stop done to increase temperature. The tyre pressure was then checked again.
- At least three runs per tyre were allowed.
 If a run was not representative (for instance when the brake point was missed or because of a false start), up to two extra runs were allowed.
- The average of three runs was recorded the best and worst runs were dropped.
- The ground track for the gravel braking test was swept before every test, and the control vehicle prepared and maintained the sand tracks for the pull and climb tests.
- The prescribed tyre pressures were confirmed on the control and test vehicles before every test.
- Representatives of all the tyre manufacturers were invited to attend the tests.
 They could also appeal if they picked up anything untoward.
- A technical committee consisting of a representative from Klipbokkop and Drive Out as well as three tyre manufacturers was elected daily to address any problems or complaints. The decision of this committee was final.
- Representatives from the controlling bodies in the tyre industry, the South African
 Tyre Manufacturers' Conference (SATMC)
 and the Tyre Importers Association of
 South Africa (Tiasa) were invited as independent observers.

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RESULTS



TEST 2 **BRAKING DISTANCE -GRAVEL SURFACE**

For this test, the 2 bar pressure level was kept, but runs were done from 80 km/h being the legal speed limit on gravel roads in South Africa. Before each test, the control vehicle did three test runs to confirm the control reference mark and after each test the track was swept again.

The Falkens and Nankangs (as we by now expected) again fared well, but the Goodyear Wranglers did exceptionally well (achieving a stopping distance nearly 4 m shorter than that of the control tyre set) and the General Grabbers also shined.

The majority of tyres dragged the Hilux to a standstill in 30 to 31 m - with minute differences in points the result. This explains the small points difference (0,58) between the General Grabbers (4th) and Achilles Desert Hawks (6th); and 0,52 points difference between the Hankooks Dynapros (9th) and Yokohama Geolandars (13th).

Also conspicuous was the way in which the Velocity, Kumho and BFGoodrich tyres stopped the bakkie by building up a wall of gravel in front of the wheels.



Distance measured taking control test dis-

TEST 1

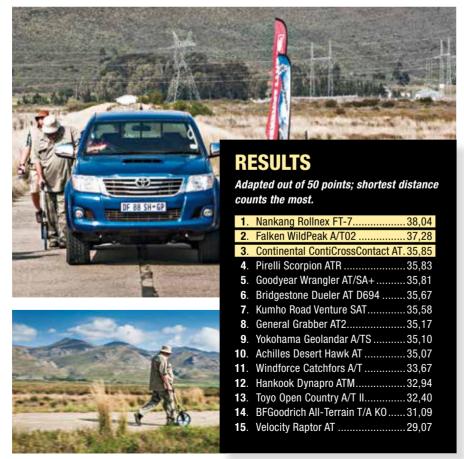
BRAKING DISTANCE -TARRED SURFACE

This brake test, done in compliance with international ISO standards, measures the tyre's stopping performance from 100 km/h to standstill on a flat tar surface. Tyre pressure for this test was 2 bar.

It was quickly clear that difference in stopping distances of the different sets of tyres would be miniscule. This says a lot about the latest tyre technology.

However, the performance of the Nankang and Falken tyres surprised everyone, with the FT-7s bringing the Hilux to a halt in only 31,9 m. Giniel's efforts saw virtually all the tyres stopping the Hilux in less than 35 m, the exceptions being the BFGoodriches (39 m) and Velocity Raptors (41 m).

In the BFGoodriches' case it was probably because of the more aggressive tread pattern, whereas the Raptors' pattern is older. However, tyres with tread patterns that perform well in braking tests don't necessarily do well in off-road conditions and this was clearly reflected in our tests.



TEST 3 TRACTION IN SAND

A Jurgens XT140 off-road trailer weighing 600 kg and loaded with 100 kg (700 kg in total) was hitched to the Hilux. The bakkie had to pull its own weight and that of the loaded trailer through a prepared sand track with a 10-degree inclination. The control Hilux, with tyres deflated to 1,2 bar, drove the track until it got stuck. The starting point was then set from the point where the vehicle barely made it through the course. (The rationale behind this was that the control vehicle and tyres would fare slightly better that the test bakkie with AT tyres,

therefore a distance could be set from the control reference point to where the test vehicle ground to a halt.) If any of the test tyres successfully negotiated the course, the control mark was moved forward until the test vehicle did not make it any more. Bonus points were added for each successful run.

The General, Hankook, Kumho and Goodyear tyres made it (necessitating the control mark to be moved forward), whereas the Yokohama, Bridgestone and Toyo tyres came achingly close. The General Grabbers again showed they like sand and have heaps of grip. We expected more of the BFGoodriches and Pirelli Scorpions, but it was clear the 1,2 bar limit did not suit them.>

RESULTS

Distance adjustment against control mark, bonus points added, adjusted from 50 points.

1.	General Grabber36,2	
2.	Hankook Dynapro ATM35,6	1
3.	Kumho Road Venture SAT34,5	1
4.	Goodyear Wrangler AT/SA+33,7	1
5.	Yokohama Geolandar A/TS33,6	1
6.	Bridgestone Dueler AT D694 31,5	1
7.	Toyo Open Country A/T II31,3	1
8.	Windforce Catchfors A/T31,2	

9.	Falken WildPeak A/T02	28,7
D.	BFGoodrich All-Terrain T/A KO	28,2
١.	Velocity Raptor AT	26,6
2.	Continental ContiCrossContact AT.	26,3
3.	Pirelli Scorpion ATR	26,3
4.	Achilles Desert Hawk AT	25,3
5.	Nankang Rollnex FT-7	23.7

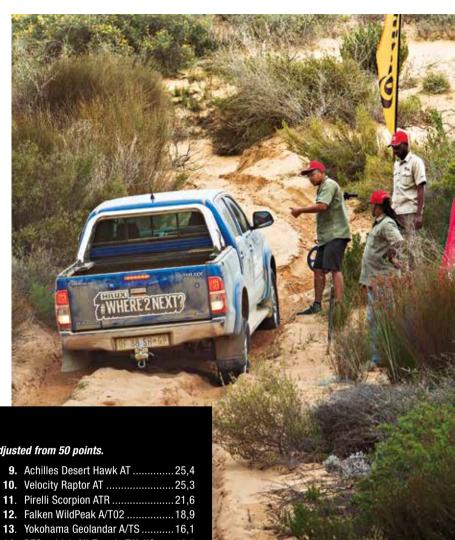
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TEST 4

CLIMBING ABILITY IN SAND

The highlight of this test - to challenge the tyres' climbing ability in sand on a steep incline - was the performance of the General Grabbers. They literally "grabbed" their way nearly to the top. They were indeed the Generals of this test. The Bridgestones also impressed, but the big surprise was the performance of the cheaper imported Windforce rubber.

The Goodyear Wranglers and Continental ContiCrossContacts' results. however, were a bit disappointing. It could be because they were tested in slightly warmer conditions (22 °C), but compared with the control runs they just did not work for the hill climb. The same goes for the BFGoodriches, but as in previous tests it is probably due to a too high pressure for their construction. Their performance in the previous test wasn't too shabby, but they completely fell out of the bus on the uphill.



RESULTS

Distance adjustment against control mark, adjusted from 50 points.

1.	General Grabber	44,2
2.	Bridgestone Dueler AT D694	42,5
3.	Windforce Catchfors A/T	32,5
4.	Hankook Dynapro ATM	32,3
5.	Goodyear Wrangler AT/SA+	27,9
6.	Kumho Road Venture SAT	26,2
7.	Continental ContiCrossContact AT.	25.7

8. Toyo Open Country A/T II......25,6

14. BFGoodrich All-Terrain T/A KO 15,5 15. Nankang Rollnex FT-7.....14,1



TEST 5 **HOW WELL DO THEY SEAT ON THE RIM?**

The last test was devised to assess the tyres' sidewall construction, as some tyres are prone to dislodge from the rim when the tyre pressure is low.

By pulling the test Hilux at an angle with a rope while its wheels were spinning, the tyres' sidewalls were strained. With each test, tyre pressure was lowered from the initial 1,2 bar down to 0,8 bar eventually. If the tyre was still seated at 0,8 bar (in our opinion the lowest safe pressure), it passed the test and scored full marks (50 points).

As it turned out, all the tyres passed this test with flying colours.

IN A NUTSHELL

Given the Grabbers' good performance in the traction and pulling tests, General Tire can raise its pennant victoriously after this all-terrain campaign. The Bridgestone Duelers were the runners-up, followed by the Hankook Dynapro and Goodyear Wrangler AT/SA+ tyres, separated by only 0.6 points.

The performance of the imported Chinese Windforce tyres was a pleasant surprise, more so because of the importer SA Tyre's umming and ahing up until the last minute on whether to participate.

What also transpired was that the Continental ContiCrossContacts in their latest incarnation are more tar-orientated and did not perform well in the other tests.

Judged by the performance of the BFGoodrich tyres, it also seems the decision by distributors of hard-core rubber Maxxis, Cooper and Mickey Thompson not to participate was vindicated.

However, this does not mean these tyres aren't capable off-road – in the same tests against more aggressive MT rubber or with lower pressures they might have performed better.

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FINAL RESULTS MANUFACTURER/TYRE 2 (50) 3 (50) 4 (50) 5 (50) T0TAL/250 General Grabber AT2... .35,17 32,81 36,2 44,2 50 198,38 31,5 42,5 50 Bridgestone Dueler D694.. .35.67 31.14 190.81 50 Hankook Dynapro ATM32.94 35.6 32.3 3. 30.75 181.59 4. Goodyear Wrangler AT/SA+.. .35.81 33.54 33.7 27,5 50 180.95 50 5. Windforce Catchfors AT . .33,67 31,71 31,2 32,5 179,08 50 .35.58 34.5 26,2 Kumho Road Venture SAT. 30.26 176,54 50 Toyo Open Country AT.... .32.40 29.21 31.3 25.6 168.51 50 Continental ContiCrossContact AT35.85 30,47 26,3 25,8 168,42 50 Falken WildPeak A/T0237,28 28,7 18,9 168,36 9. 33,48 25.3 50 Achilles Desert Hawk AT35.07 32.23 25.4 168.00 10. 50 Pirelli Scorpion ATR.... .35.83 32,36 26,3 21,6 166,09 Yokohama Geolandar A/TS.. .35.10 50 165,03 30,23 33,6 16,1 Velocity Raptor AT.... .29.07 30.45 26.6 25.4 50 161,52 13. .38.04 50 33,32 23,7 14,1 Nankang Rollnex FT-7 ... 159,16 50 BFGoodrich T/A KO31,09 29,73 28,2 15,5 154,52

TESTING NOTES AND GINIEL'S COMMENTS



BFGOODRICH ALL-TERRAIN T/A KO (R3833*)

Given their rigid profile and aggressive tread pattern. the BFGoodriches were surprisingly quiet on asphalt. Their stopping performance

on tar wasn't up to par and control under braking on gravel was also compromised. The tread pattern is too aggressive for loose sand and dirt.



NANKANG ROLLNEX FT-7 (R1925)

The Nankangs' braking performance on tar was a revelation, but its tread pattern did not work well in the off-road tests. Giniel says the tyres gave the

Hilux a bumpy, harsh ride. And although they stopped well, there was no real finesse - it was a case of uncontrolled "grab and bite".



VELOCITY RAPTOR AT (R1895)

These tyres were quite manageable in the gravel braking test and also comfortable on-road (they also sounded quiet from outside the vehicle), says

Giniel. "They displayed the same tendencies as the BFs" - as the test results confirmed.



УОКОНАМА GEOLANDAR ATS

(R1837)

Geolandars are viewed as good off-road tyres, but it seems Yokohama has not kept up with the latest technology. Giniel says they

had less traction than the others, and we reckon the regulated tyre pressure did not suit the Yokies in the climbing test.



PIRELLI SCORPION ATR (R2 335)

Pirelli is better known for its high-performance tyres (think Formula 1), vet its Scorpions have been available locally for a while. Their braking performance was

fair, but off-road they did not fare as well. Still, Giniel says they ensured a lighter steering response from the Hilux.



ACHILLES DESERT HAWK AT (R1710)

The Achilles brand is the more affordable entrylevel tyre in the TiAuto range. Given the price, the Desert Hawks gave

a good account of themselves, and if it weren't for their under-par performance in the traction test they would have fared even better overall.



WINDFORCE CATCHFORS A/T (R1742)

We did not have high hopes for this Chinese import, but it surprised everyone with its good performance in all the

tests. Giniel, however, was not convinced. "The tyres felt unbalanced." he said. "and made the vehicle shudder, affecting the ride quality."

(R2500)

lost points in the off-road tests, Giniel was

lability, specifically under braking.

impressed by their consistency and control-

GOODYEAR

WRANGLER AT/SA+

The small points difference

between the Goodyears

and Hankooks illustrate

the level of competition.

Although the Goodyears



FALKEN WILDPEAK A/T02 (R1630)

cheapest of all the tyres) and performance in the braking tests, the WildPeaks are a good

tyres for good on-road (but less off-road) performance. Giniel says although they felt



Given their price (the option for those who need

quite stable, their ride quality is hard.



CONTINENTAL

up to our expectations, probably because they're now more on-roadoriented, but Giniel has

high praise for the ride quality: "The Contis are consistent and stable."





HANKOOK DYNAPRO **ATM (R2160)**

well in all conditions and

The Korean Hankook tyres' showing confirms that the established brands now have strong competition locally. The Dynapros did

BRIDGESTONE

DUELER AT D694

Giniel was particularly impressed by their soft ride on tar as well as in off-road situations.

(R2128)



Toyo Tires is a wellestablished brand overseas but is not as well known locally. Its 4x4 tyres are rated highly, however, and our test results support

this. But according to Giniel their hard construction diminished their ability to find traction in the braking tests.

KUMHO ROAD

VENTURE SAT (R2230)

This brand from Korea is

already well established

locally, but its all-terrain

tyres are not that well

known. In terms of

performance and feel



TOYO OPEN COUNTRY A/T II (R2130)



why the Bridgestone Duelers are original equipment for the Hilux they are complementary to the vehicle. According to Giniel, their

The tests made it obvious

predictability made them a pleasure to drive. "They make you feel safe," is his verdict.



GENERAL GRABBER AT2 (R2212)

Interestingly, Grabbers used to be OE tyres for Hilux before Duelers were chosen for the latest models. Their off-road performance and good stopping power made

them the tyre of choice. "They drift a bit and you need to correct the line," Giniel says, "but their stopping power is deadly."

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limited traction during braking.

they're similar to the Toyos, says Giniel, in

that they gave a less comfortable ride and

PRICE COMPARISON

Which tyre is the best value for money when you compare price versus performance in our tests? To avoid possible special offers, we secured prices through the independent tyre franchise Errol's Tyres.

At Errol's, the Falken WildPeak A/T02 is the cheapest (R1 630 per tyre, thus R6 520 per set) in our comparison.

The Achilles Desert Hawk and Windforce Catchfors tyres were also available for less than R7000 per set, making Windforce the bargain purchase and best value-for-money tyre given its price against performance.

Keep in mind we only tested their performance in these specific circumstances and therefore cannot vouch for their performance after extended usage over time.

Four of the main contenders, the General Grabber, Bridgestone Dueler, Hankook Dynapro and Kumho Road Venture, are all available for less than R10000 per set, and Achilles, Pirelli, Velocity and Nankang can also justify their pricing given the tyres' performance.



CONCLUSIONS

Our tests made it clear that you will not find a low-quality or bad all-terrain tyre distributed through official channels in the country any more. Nowadays, the level of development, construction and technology is definitely higher – even for more affordable and/or imported tyres – and in our tests not one brought their manufacturer into discredit.

There is a perception that a more aggressive tread pattern will do better in off-road conditions, but this is not necessarily true. Our tests confirm that a smoother tread could be advantageous, especially in sandy conditions.

Pressure is also of the utmost importance. Some tyres in our test –such as the BFGoodrich, Yokohama, Velocity, and perhaps

the Toyo and Kumho tyres – may have performed better at a lower pressure. (Keep in mind, however, that the other tyres might also have performed better at the same lower pressure.)

Therefore, be absolutely certain for what purpose you are acquiring a specific tyre, do not generalise these specific test results, and ensure that you're aware of a specific tyre's requirements and limitations before you hit the road.

Our heartfelt thanks to Giniel, the Klipbokkop team, the personnel of Tiger Wheel & Tyre and the representatives of the tyre organisations and participating manufacturers, importers and distributors for their assistance and support.



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