



# AA RESEARCH

South African  
'entry level' vehicle safety report

get out there



## Contents

1. Introduction .....	3
1.1 Background to the study.....	3
1.2 Purpose of study .....	3
1.3 Scope of research .....	4
1.4 Overview of Report.....	4
2. Equipment review .....	4
2.1 Introduction .....	4
2.2 Active/Passive safety features .....	5
2.3 Sample of motor vehicles.....	7
3. Research methodology .....	9
3.1 Identification of vehicle sample.....	9
3.2 Safety scoring .....	9
4. Overall results .....	11
5. Discussion and findings .....	12
6. Limitations.....	13
7. Way forward.....	14
References .....	14

## 1. Introduction

### 1.1 Background to the study

'Domestically, the short to medium term outlook was one of low economic growth and further pressure on consumers' disposable income. Double digit new vehicle price increases, as a result of exchange rate weakness and vehicle production inflation of 14.8% for the first seven months of 2016, relatively high interest rates, low levels of consumer and business confidence – would combine to further pressurize sales of new motor vehicles, particularly new cars.' – (NAAMSA, 2016)

The current socio-economic climate has proven to be a challenge for the majority of South Africans. The depreciation of the Rand and increase in the cost of commodities has forced many to consider the price they pay for all necessities. This is no different when deciding on buying a motor vehicle, which is still the most dependable form of transport in South Africa.

The questions that arise surrounding a motor vehicle purchase are significant because the livelihood of the people who drive them are reliant on their proper functioning. And, a car is also an expensive asset, in many cases second only in cost to homes.

### 1.2 Purpose of study

For this report, two key factors stand out which are pertinent for consideration when decisions arise regarding the purchasing of a motor vehicle: safety and affordability. To this end, a threshold of R150 000 was set as a benchmark to determine vehicles for evaluation, this being a value that the Automobile Association (AA) considered to be 'entry-level'.

The variety of motor vehicles available in South Africa is not equal when viewed in terms of the quality and features on offer, especially when considering the number of **basic safety features** available in '**affordable**' motor vehicles. This then begs the question, how does one make a decision to get the most safety features for the money spent? This report seeks to identify and compare the standards of safety equipment present in motor vehicles on the South African market for under R150 000 (entry-level).

### 1.3 Scope of research

Objectives of this report:

- Identify the number of basic safety features available in motor vehicles which retail under R150 000,
- Identify which safety features are most prominent in these motor vehicles,
- Develop a method which allows for the comparison of safety features found in these vehicles, and,
- Highlight the vehicles with the most, and least, safety features in relation to their retail pricing.

### 1.4 Overview of Report

In the sections below, the report will address the fundamentals of a vehicle's safety equipment which have been divided into 'Active' and 'Passive' safety features. The importance of each of these safety features will be explained, followed by the methodology used in addressing their significance. In turn, this allows for the allocation of 'safety' points for the motor vehicles under investigation. Once this is achieved, the reader can gain a clearer understanding of how entry-level vehicles on the South African markets rate in terms of **safety** and **affordability**.

## 2. Equipment review

### 2.1 Introduction

For the purpose of this report, the AA examined each of the vehicles in the selected price bracket for what we regard as the minimum safety features which promote increased safety in preventing crashes, or moderating their effects. An explanation of these minimum safety features, as well as the motor vehicles under investigation, is highlighted below.

## 2.2 Active/Passive safety features

**2.2.1 Active safety features** refers to devices and systems that assist in keeping a motor vehicle under control and possibly prevent a crash from occurring. These systems are usually automated to aid in compensating for human error, which is recognised as being the single largest cause of motor vehicle crashes. Active safety features investigated within our specified range of motor vehicles are:

- *Anti-lock braking system (ABS)*: - which prevent the wheels from locking up when the driver applies the brakes, enabling the driver to steer while braking.
- *Electronic stability control (ESC)*: - it works by detecting if the steering inputs of the driver are inconsistent with the vehicles direction of travel which then applies the relevant brakes that prevents the wheels from slipping and keeps the vehicle under control and on the road in hazardous conditions. It should be noted that ESC systems may have different acronyms between different motor manufacturers, however in essence they all look to achieve the same results.

**2.2.2 Passive safety features** refers to systems within the motor vehicle that protect occupants from injury in the case of a motor vehicle crash. The passive safety features under consideration for this report are the secondary/supplementary restraint system (SRS) or more commonly known as air bags, which provide a cushion upon impact to protect the driver and passengers during a crash. Each vehicle's specification was examined for the presence of:

- Driver side airbags
- Passenger side airbags
- Curtain airbags
- Side airbags

Location of the various airbags is illustrated in Figure 1 on the next page.

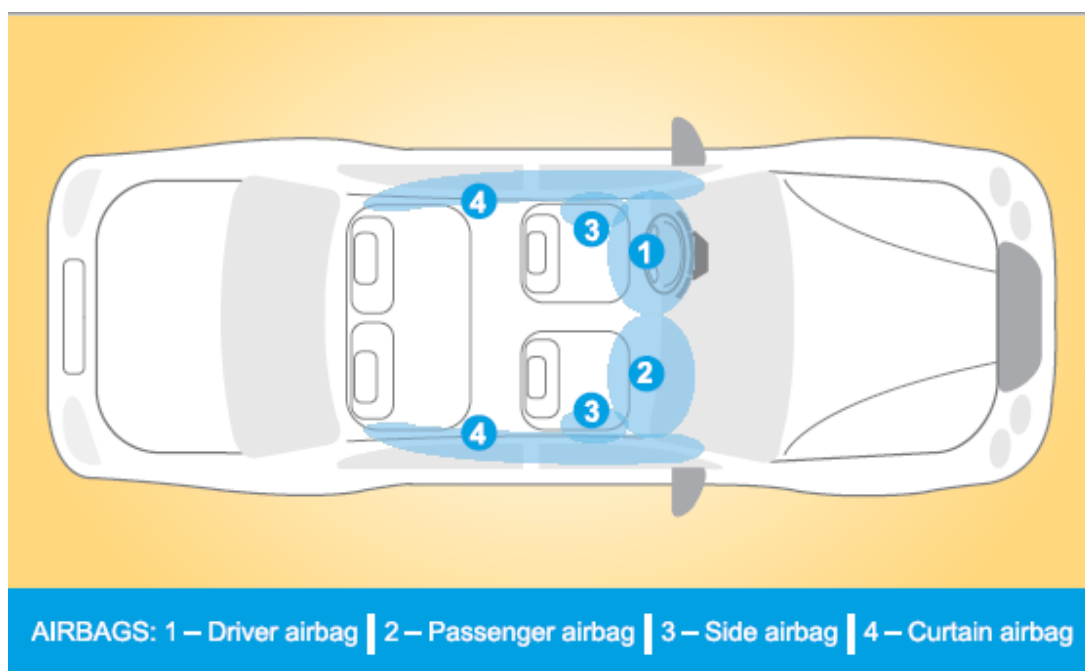


Figure 1. Location of airbags

**2.2.3 Euro/Global (Other) NCAP testing** – ‘NCAP has created the five-star safety rating system to help consumers, their families, and businesses compare vehicles more easily and to help them identify the safest choice for their needs. The safety rating is determined from a series of vehicle tests, designed and carried out by Euro NCAP. These tests represent, in a simplified way, important real-life accident scenarios that could result in injured or killed car occupants or other road users. The number of stars reflects how well the car performs in Euro NCAP tests, but it is also influenced by what safety equipment the vehicle manufacturer is offering in each market. So, a high number of stars shows not only that the test result was good, but also that safety equipment on the tested model is readily available to all consumers in Europe’ - (EuroNcap, 2016)

**It should be noted that there are a number of NCAP testing standards throughout the world and while these tests are critical in terms of a high quality 3<sup>rd</sup> party independent testing standard, buyers would be encouraged to look at the testing requirements for each region. It cannot be assumed that a three star rating on one will be the equivalent to a 3 star rating on another.**

The presence of the features highlighted above will serve as the standard to determine the level of safety within the motor vehicles under R150 000. A point based system has been developed that awards motor vehicles 'safety points' in relation to the existence of safety equipment fitted. Furthermore, motor vehicles that have undergone a crash test under the NCAP system (In this case EURO NCAP) will be given additional points. This scoring procedure is explained in further detail in the methodology section. It is important to note that the AA recognizes that various safety features contribute differently in terms of fatality/injury prevention, but for the purpose of this report, scores are awarded merely on the face value of their existence.

### **2.3 Sample of motor vehicles**

Table 1 below indicates the motor vehicles which have a retail price of less than R150 000. Twenty three (23) models make up the sample of vehicles from 13 different manufacturers. All vehicle pricing and safety features have been collected from dealership brochures and are correct as of 31 August 2016.

*Table 1. Make, model and retail value (highest to lowest) of motor vehicles*

<b>Make and Model</b>	<b>Price</b>
Chery J2 1.5TX	R149,995
Citroen C1 Vti 51kW Feel	R149,900
Chevrolet Spark 1.2L	R149,000
Honda Brio Hatch 1.2 Trend	R148,600
Mitsubishi Mirage 1.2 GL	R148,400
Renault Sandero 66kW turbo Expression (excl A/C)	R147,900
Suzuki Celerio 1.0 GL	R146,500
Suzuki Swift Hatch 1.2 GA	R145,500
Kia Picanto 1.2 LS	R139,995
Chevrolet Spark 1.2 Campus	R137,400
Tata Vista Ini Bounce	R134,995
Kia Picanto 1.0 LS	R129,995
Suzuki Celerio 1.0 GA	R129,900
FAW V2 1.3 #Like	R124,995
Tata Indica LGI Sport	R123,995
Datsun GO 1.2 LUX	R119,900
Tata Indica LE AC	R118,995
FAW V2 1.3 DLX	R114,995
Chery QQ 1.1 TXE	R114,995
Chery QQ 0.8TX	R104,995
Datsun Go 1.2 Mid	R104,900
Chery QQ3 0.8 TE	R99,995
Geely GC2	R92,990



### 3. Research methodology

#### 3.1 Identification of vehicle sample

From the onset, the R150 000-designation was set as the benchmark in identifying the potential vehicles for investigation. This price level was chosen as it appeared to represent the limit of what would be regarded as 'entry-level' vehicles.

A vehicle costing R150 000 with a 10% deposit, financed over 72 months, with an interest rate of 12%, produces a monthly instalment of R2 500. A variance of around R10 000 on the vehicle's purchase price will add or remove roughly R166 from the monthly instalment costs.

These figures are indicative only and are shown to indicate an approximation of the difference in monthly instalment that a buyer may expect based on this financing model – *Real world numbers will vary.*

#### 3.2 Safety scoring

A safety point-based system was developed with relevant weights allocated to the existence of certain safety features. Active safety features such as ABS and ESC were given the most significant weights (30 points each), as the importance of their core function of **avoiding collisions** is recognised.

In relation to passive safety features, focus is placed on the presence of the number of airbags available, with each of the airbags scoring 10 points. The only exception is that of the curtain airbag, which scores 20 points (an additional 10 points), as studies have shown that curtain airbags can drastically reduce life threatening head injuries by up to 50% (Insurance Institute for Highway Safety, 2006).

Safety points have also been allocated to motor vehicles which have undergone the Euro/Global NCAP crash test. As NCAP testing is not mandatory for vehicles to be approved for market release, the vehicles which have undergone the process represent a particular, repeatable safety benchmark which allows the public to evaluate their crash performance. As such, an additional five safety points has been allocated for each star achieved on the NCAP safety rating scale (maximum of five stars, 5 x 5 = 25 maximum achievable points).

On account of the features mentioned above, a **total of 135 points** is achievable if a motor vehicle has all of the safety features installed. Safety feature weighting can be seen in the Table 2:

Table 2. Safety feature weighting

Active safety (crash prevention)	Maximum Score	Comments
Anti-lock brakes (ABS)	30	Present – full score. Absent – no score
Electronic Stability Control	30	Present – full score. Absent – no score
Passive safety (crash protection)	Maximum Score	Comments
Driver's airbag	10	Present – full score. Absent – no score
Front passenger airbag	10	Present – full score. Absent – no score
Side airbags	10	Present – full score. Absent – no score
Head / curtain airbags	20	Present – full score. Absent – no score
Crash test rating (frontal impact)	25	Pro-rata – five points per star. Must be for equivalent spec vehicle rated under current (post-2009) Euro NCAP or Global NCAP.
<b>Total points achievable</b>	<b>135</b>	Perfect score

In addition to the weights/points allocated, a 'Safety/Affordability' index was created with the following formulae:

$$\frac{\text{Overall Safety Score}}{(\text{Price of Vehicle} \div R10000)} = \text{Safety/Affordability Score}$$

Example:

$$= \frac{135}{(R150000 \div R10000)}$$

$$= \frac{135}{(15)}$$

$$= \underline{9.0} \quad (\text{Safety/Affordability score})$$

The highest achievable Safety/Affordability index score above is thus - 9.0. This is calculated with the maximum scores of 135 safety points and the R150 000 vehicle price in mind. This index allows us to draw a comparison of the safety features (associated with this report) one can buy in terms of every R10 000 spent.

## 4. Overall results

Table 3. Overall safety scores for all 23 vehicle models (highest to lowest)

Make and Model	Price	Total	Anti-lock brakes (ABS)	Electronic Stability Control	Driver's airbag	Front passenger airbag	Side airbags	Curtain airbags	Crash test rating (NCAP)	Safety per R10k
<b>Maximum achievable</b>	<b>R150,000</b>	<b>135</b>	<b>30</b>	<b>30</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>20</b>	<b>25</b>	<b>9.00</b>
Citroen C1 Vti 51kW Feel	R149,900	130	30	30	10	10	10	20	20	8.67
Renault Sandero 66kW turbo Expression (excl A/C)	R147,900	80	30	30	10	10	0	0	0	5.41
FAW V2 1.3 DLX	R114,995	50	30	0	10	10	0	0	0	4.35
FAW V2 1.3 #Like	R124,995	50	30	0	10	10	0	0	0	4.00
Suzuki Celerio 1.0 GA	R129,900	50	30	0	10	10	0	0	0	3.85
Chevrolet Spark 1.2 Campus	R137,400	50	30	0	10	10	0	0	0	3.64
Suzuki Swift Hatch 1.2 GA	R145,500	50	30	0	10	10	0	0	0	3.44
Suzuki Celerio 1.0 GL	R146,500	50	30	0	10	10	0	0	0	3.41
Mitsubishi Mirage 1.2 GL	R148,400	50	30	0	10	10	0	0	0	3.37
Honda Brio Hatch 1.2 Trend	R148,600	50	30	0	10	10	0	0	0	3.36
Chevrolet Spark 1.2L	R149,000	50	30	0	10	10	0	0	0	3.36
Chery J2 1.5TX	R149,995	50	30	0	10	10	0	0	0	3.33
Chery QQ 1.1 TXE	R114,995	20	0	0	10	10	0	0	0	1.74
Datsun GO 1.2 LUX	R119,900	10	0	0	10	0	0	0	0	0.83
Kia Picanto 1.0 LS	R129,995	10	0	0	10	0	0	0	0	0.77
Kia Picanto 1.2 LS	R139,995	10	0	0	10	0	0	0	0	0.71
Geely GC2	R 92,990	0	0	0	0	0	0	0	0	0.00
Chery QQ3 0.8 TE	R 99,995	0	0	0	0	0	0	0	0	0.00
Datsun Go 1.2 Mid	R104,900	0	0	0	0	0	0	0	0	0.00
Chery QQ 0.8TX	R104,995	0	0	0	0	0	0	0	0	0.00
Tata Indica LE AC	R118,995	0	0	0	0	0	0	0	0	0.00
Tata Indica LGI Sport	R123,995	0	0	0	0	0	0	0	0	0.00
Tata Vista Ini Bounce	R134,995	0	0	0	0	0	0	0	0	0.00

## 5. Discussion and findings

The purpose of the current report was to inform the public on the safety features currently available in the 'entry-level' segment of motor vehicles in South Africa. Anecdotal evidence suggests that buyers of entry level motor vehicles usually prioritise *affordability* over other vehicle features. However, one should not disregard the safety aspect when making this important decision.

Anti-lock brakes, electronic stability control, and the number of airbags on offer, served as the assessment criteria for the 23 identified motor vehicles. As important as they are, the allocation of points for safety belts was not taken into consideration as they are now standardised for all motor vehicles. The presence of head restrains was initially considered as part of the assessment criteria, but insufficient information was available, and this assessment criterion was eliminated from the report. In future, this, and other safety technologies, may be considered for inclusion, as the specification level of entry-level vehicles increases over time.

Of all the motor vehicles under consideration only one model, the Citroën C1, had all safety features installed as standard. The only loss of points incurred was due to the C1 only being granted four out of five stars on the Euro NCAP crash test. It is worth noting, however, that it was also the only vehicle to have undergone Euro NCAP testing and to be sold on the South African market with the same safety specifications as tested.

Another significant discovery was that six of the 23 vehicles under consideration had **none** of the identified safety features installed, and, as can be seen in Table 3, the safety features which make up the rest of the 23 models vary across brands and pricing.

As part of the study, the standard specification level of each vehicle was also examined. It was found that, in several cases, vehicles are fitted with numerous items of equipment which may be regarded as 'convenience' or 'luxury' features, even though the vehicles in question offered low levels of safety equipment.

As for the Safety/Affordability index developed for this report, one can use it as a guide to understanding it as an 'Affordability of Safety' proposition. For this report, a score of four (4) points and above can be seen as '*acceptable safety*', a score between three (3) and 3.99 points can be seen as '*moderate safety*', whereas 2.99 points and below can be seen as '*poor safety*' on the Safety/Affordability index. As can be seen in Table 4 below: four (4) vehicles fall

Compiled by the Automobile Association of SA

under the 'acceptable safety' category, eight (8) vehicles fall under the 'moderate safety' category, and eleven (11) vehicles fall under the 'poor' safety/affordability categories.

*Table 4. Safety/Affordability categories*

<b>'Poor' Safety/affordability (Score ≤ 2.99)</b>	<b>'Moderate' Safety/affordability (Score 3 - 3.99)</b>	<b>'Acceptable' Safety/affordability (Score ≥ 4)</b>
Chery QQ 1.1 TXE	Suzuki Celerio 1.0 GA	Citroen C1 Vti 51kW Feel
Datsun GO 1.2 LUX	Chevrolet Spark 1.2 Campus	Renault Sandero 66kW turbo Expression (excl A/C)
Kia Picanto 1.0 LS	Suzuki Swift Hatch 1.2 GA	FAW V2 1.3 DLX
Kia Picanto 1.2 LS	Suzuki Celerio 1.0 GL	FAW V2 1.3 #Like
Geely GC2	Mitsubishi Mirage 1.2 GL	
Chery QQ3 0.8 TE	Honda Brio Hatch 1.2 Trend	
Datsun Go 1.2 Mid	Chevrolet Spark 1.2L	
Chery QQ 0.8TX	Chery J2 1.5TX	
Tata Indica LE AC		
Tata Indica LGI Sport		
Tata Vista Ini Bounce		

We are hopeful that this report will inform the public and persuade motor manufacturers to prioritise safety in vehicles produced for the South African market.

In particular, we call upon motor manufacturers to consider substituting luxury or convenience specification items with safety items. We believe this consideration must be weighed against the inexperience of the typical drivers of these vehicles, and the need to protect them against traffic hazards to the greatest extent possible.

## **6. Limitations**

The AA takes note that there are a multitude of safety features available on the market and also recognises the various effects they may have in reducing fatalities/injuries. As such the calculations used herein are by no means all-encompassing in terms of their ability to save lives, but merely addresses their existence within a motor vehicle. Furthermore, the current weighting system was developed by the AA, and is based on 'face-value' importance of the

various safety features under investigation. Hence, the AA recognises that there will be room for improvement regarding the allocation of weights to safety features in future reports.

## **7. Way forward**

The current report is the first of what will become an annual assessment to document the possible progression of available safety features on 'entry-level' vehicles available in South Africa.

Direction of possible future research can also be drawn towards the motor vehicle homologation processes set about by the National Regulator for Compulsory Specifications (NRCS). This way, a better understanding of the relevant safety standards for a motor vehicle to be deemed fit for the South African public can be easily understood, as well as pushing for higher levels of minimum safety requirements before these vehicles are released for sale in South Africa.

## **References**

EuroNcap. (2016, september 20). <http://www.euroncap.com/en/about-euro-ncap/how-to-read-the-stars/>. Retrieved from [www.euroncap.com](http://www.euroncap.com).

Insurance Institute for Highway Safety. (2006, October 7). Status Report Vol. 41, No.8.

NAAMSA. (2016, September 20). <http://www.naamsa.co.za/papers/>. Retrieved from [www.naamsa.co.za](http://www.naamsa.co.za).