

ANNUAL REPORT 2010 -11

# TECHNOLOGICAL



# TECHNO\_LOGICAL



In many ways, satisfying the Indian customer is probably much more challenging than satisfying a customer in another market. The country has an obsession for fuel efficiency, when it comes to choosing automobiles (and rightly so, since about three-fourths of India's crude oil requirement is imported). Extracting more mechanical energy for the car from every drop of fuel is a designer's challenge. But it is vital for the consumer, the economy and the planet. At the same time, a fast growing, young and upwardly mobile, speed conscious India demands pick-up and instant response at the accelerator pedal. There is normally a trade-off between performance and fuel efficiency. A third requirement is space efficiency, as customers want the car to be compact to cope with congestion on roads and parking lots. Yet another requirement is of minimizing emissions.

The Company's next generation, K-series engines employ a plethora of state-of-the-art technologies to deliver on all these fronts. Technologies deployed could be as sophisticated as fine atomization to achieve fuel droplet diameter in microns for optimised combustion. Or, they could be as practical as using engineering polymers instead of metal in certain

engine parts for weight reduction. Quite like packing more performance in a handheld smartphone as opposed to a traditional laptop.

India's road and dust conditions, the rains and driving safety considerations similarly pose design challenges unique to India. We believe, the purpose of technology is to serve mankind with products that meet the wants of society as closely as possible, are good for their long term health, happiness, safety and well-being, use minimum natural resources and can reach out to maximum number of consumers. The choice and evolution of technologies has to serve this purpose. And India's requirements are under no obligation to follow the rest of the world.

India is expected to grow to become the world's third largest car market by 2020 from a modest start three decades ago. With about half the market, Maruti Suzuki is participating in and contributing to this growth by providing technology excellence in its cars. Excellence that always integrates with relevance.

We have termed this approach "Techno\_Logical".





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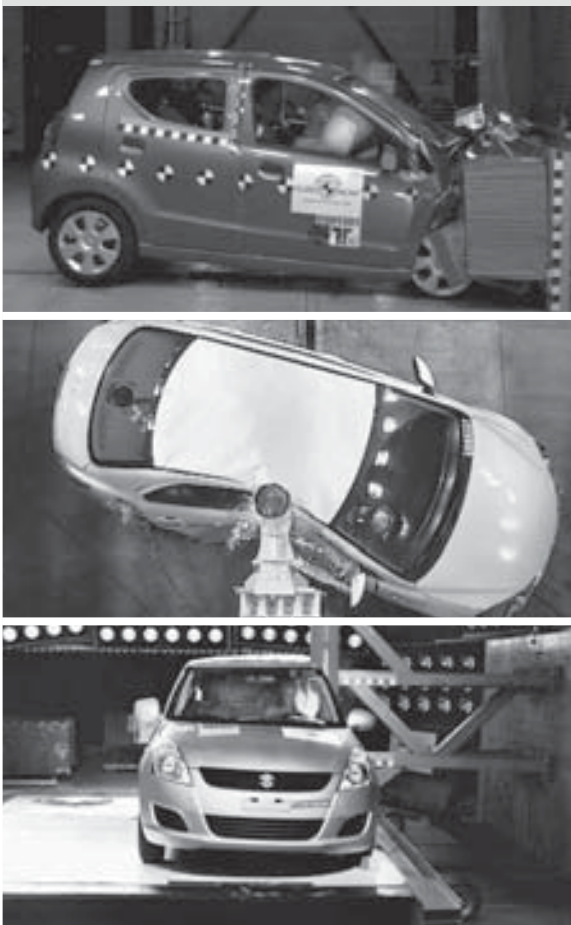
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We asked some real Maruti Suzuki customers, what made them select their cars.

And then we delved deeper into what kinds of technologies are required to deliver on these requirements.

In the next few pages we welcome you to meet some of our customers with their cars and explore how an intelligent choice of technologies creates delight for them.



*A-star, Kizashi and Swift undergoing crash test as part of the safety performance assessment.*



# TECHNOLOGICAL

The K-series engine



## MY NEW SEARCH ENGINE...

"My first car... My world on four wheels.  
Totally alive and kickin'.  
Easy in the traffic; Easy on the pocket.  
It is me.... I'm connected to it"



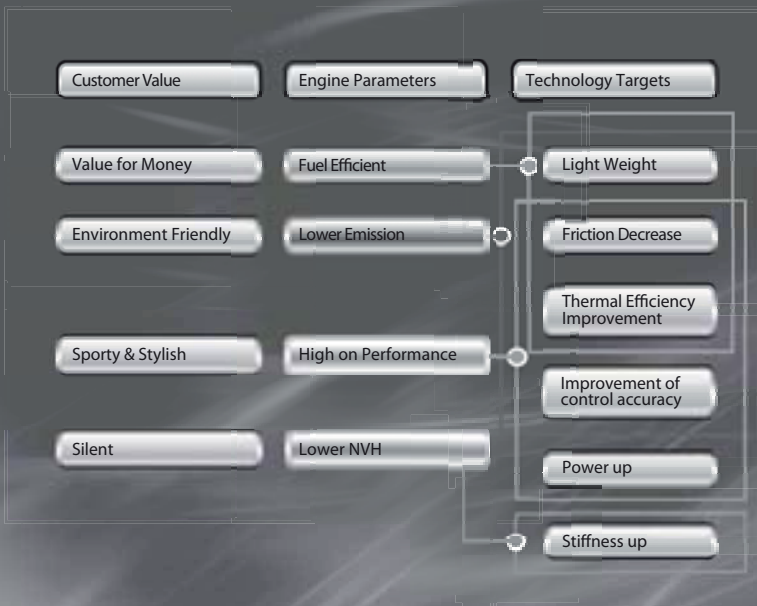
Ruchi Arora, 26  
Media Professional

## Alto K10

Powered by the K-series engine, India's favorite brand just got better and zippy. Alto K10 is the spirit to live life to the fullest, anytime, anywhere.

The 998cc engine in the Alto K10 has been carefully designed to be environment friendly and fuel efficient. A number of innovative technologies used in the engine have helped in achieving the best-in-class fuel efficiency, emission and performance with reduced noise, vibration and harshness for customer delight.

## How technologies generate customer value

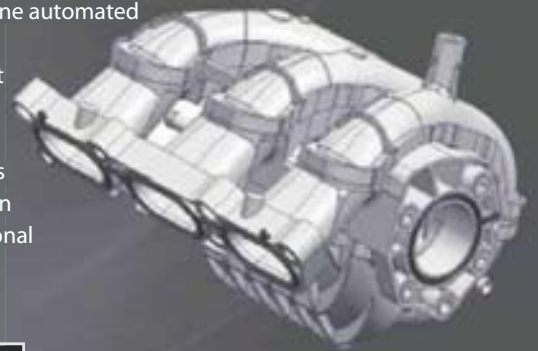


Improved engine stiffness and use of Silent Timing Chain to improve NVH (Noise, Vibration & Harshness) characteristics



## A Marvel of Engineering

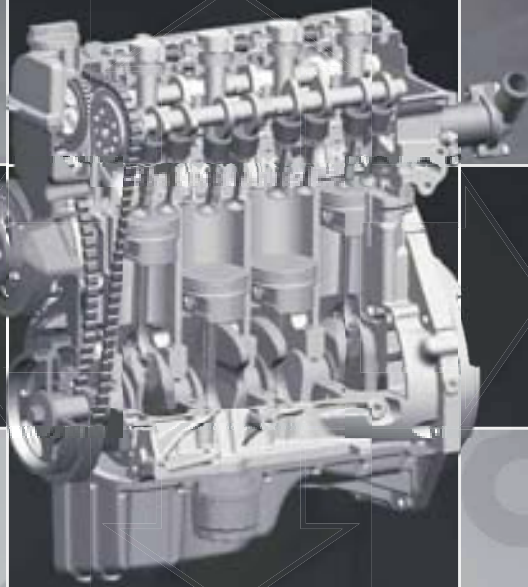
The K-series engines are a result of enormous effort in R&D and thousands of hours of design, validation and testing. They epitomise the Company's philosophy of marrying latest technologies to effectively meet customer demands. Manufactured at the state-of-the-art, fully integrated facility inside the Gurgaon plant, this new family of engines offer improved performance without compromising on mileage. The plant employs global best practices such as cold testing, 100% on-line automated checks to ensure global quality. The in-line plant layout consisting of Casting, Machining and Assembly processes has high level of automation aimed for high operational efficiency.



**Optimised Cylinder Block, Light Piston and Nut-less ConRod for light weight configuration**

**Plastic Intake Manifold in the K-series is one of many examples of technologies adopted for light weight construction**

**Smart Distributor Less Ignition (SDLI) system with dedicated plug top coils, High Pressure Semi-return Fuel System and advanced injectors for superior atomization and better performance**



**Innovative rocker-less DOHC Camshaft & offset Crankshaft with low tension rings to reduce losses and improve fuel efficiency**

**All Aluminium, light-weight engine for best-in-class fuel efficiency**



# TECHNOLOGICAL

Next Generation  
CNG cars

## i-GPI Technology

The factory fitted CNG vehicles use advanced Intelligent Gas Port Injection (i-GPI) technology. Based on the inputs from the ECU, metered CNG quantity is injected into the engine through separate injectors for each cylinder. This leads to a more efficient fuel usage. While working on the technology, our engineers have kept a high focus on safety, reliability and performance aspect of the vehicle. Every component has been designed and chosen with special attention to these details.

i-GPI technology has been extensively tested for more than 200,000 kms in varied terrains. In addition, over 3,000 hours of bench tests have validated the design and performance to bring unmatched combination of performance and reliability for our customers.



**WAGONR** Green

## WagonR Green

WagonR is a fine balance of comfort, space and performance in a dynamic new design. It is the second most popular car after the Alto in terms of sales. It is now also available in CNG, known as the WagonR Green.

WagonR Green smartly combines the i-GPI technology with a host of other features making it the smartest choice in the mid-end compact cars. It ensures more power, fuel-efficiency, safety and reliability vis-à-vis a retro-fitted CNG vehicle. The vehicles pass through all the quality checks, processes and systems similar to any car manufactured at the Maruti Suzuki plant.

Adapting the CNG technology in our vehicles is another step to keep low cost of ownership for our customers. The development is significant on multiple counts. This is the first instance when a car manufacturer has developed and launched factory-fitted, technologically superior CNG engines in India. Compressed Natural Gas is environment friendly and also reduces the country's dependence on oil import.



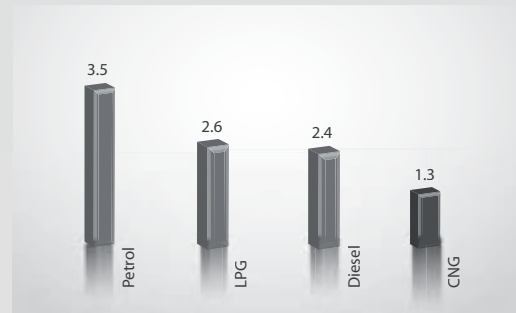
In a leap over after-market options, the i-GPI technology features a dual ECU (Engine Control Unit) and direct gas injection. This system delivers accurate amount of gas into the engine thus ensuring improved and consistent performance under various driving conditions.







Running Cost (Rs/km)\*



\* Indicative fuel cost comparison for a typical vehicle. Actual results may vary with several parameters.

## Advantage Customer

- + Contemporary CNG technology
- + Performance and Driveability at par with gasoline powered engines
- + High fuel efficiency
- + Lower running costs by 60 per cent
- + Peace of Mind: Full warranty coverage, Service support across the country
- + Vehicle body designed for CNG system
- + Safety reinforced: High Quality Components, Integrated wiring harness, CNG system leak-proofing, toughened suspension
- + Dual ECU system for enhanced performance
- + Extensive performance testing
- + No compromise on engine life



Rupesh, Vandana and Riya

"The WagonR is a true family car for all occasions. It is spacious, has good ride quality, comfort and good pickup and mileage. Since we have high usage, I wanted a CNG car but was always concerned about safety. With a factory-fitted CNG, there is No fear & No loss in power.

Vandana is a professor and tells me CNG is a cleaner fuel as well"



Rupesh Rai  
Hotel Industry Professional

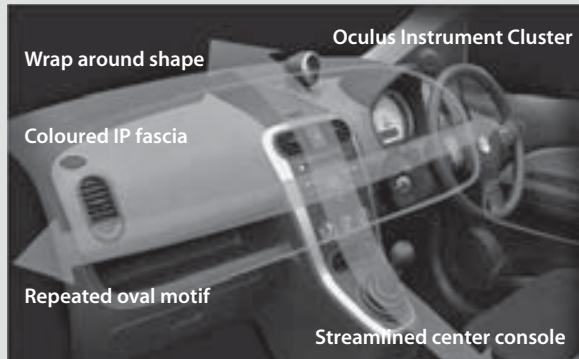
# TECHNO\_LOGICAL

New-Age Design &  
Advanced Braking Systems

The Ritz is a perfect blend of European tall-boy styling, safety, smart features and innovative engine technologies. It's a car with special attention in the area of seating comfort, space, performance and fuel-efficiency.

The suspension of the vehicle with a ground clearance of 170 mm has been tuned for the Indian road conditions.

## Youthful & Useful Interiors



It was the first passenger car in India to be compliant with the BS-IV emission norms, in both petrol and diesel variants. This was well ahead of the BS-IV norms being applicable in India, reinforcing company's efforts in bringing the best and latest in technology for the Indian customers.

With sportiness of a Swift, latest in K-series and DDiS diesel engine technology, safety features like the Airbags,

## Aerodynamic European Design Exteriors

