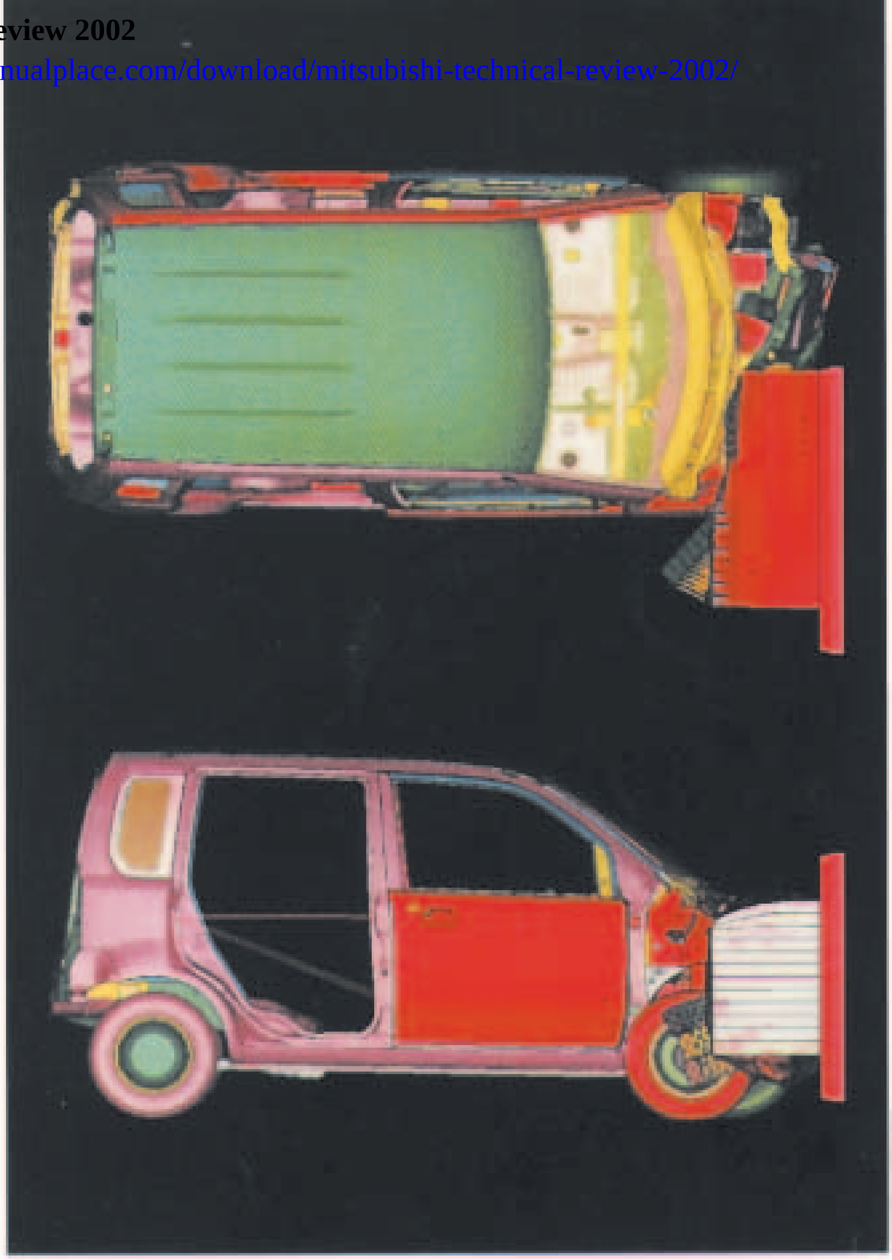

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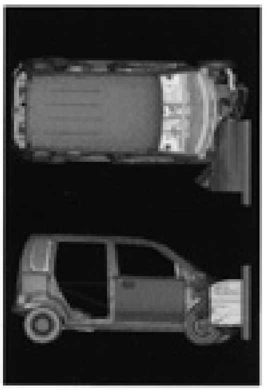
MITSUBISHI MOTORS CORPORATION
TOKYO, JAPAN



- **Cover Photograph**

The cover photograph shows the results of computer-aided-engineering analysis of an offset-deformable-barrier crash test conducted on the Mitsubishi eK-WAGON, which was launched in the autumn of 2001.

The eK-WAGON employs the Mitsubishi-developed Realized Impact Safety Evolution (RISE) body structure, which combines energy-absorbing front and rear sections and a rigid occupant cell. As a result, it offers levels of occupant protection corresponding to the highest available scores in Japan's new car assessment program.

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MITSUBISHI MOTORS CORPORATION,
33-8, Shiba 5-chome, Minato-ku, Tokyo 108-8410, Japan
Phone: +81-3-5232-7643
Fax: +81-3-5232-7770

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Previous page (top)
Mitsubishi PAJEROs dominated the 2002 Paris-Dakar Rally with a historic sweep of first, second, third, and fourth places. From the starting line in Arras (about 170 km north of Paris), this year's Dakar rally covered a total distance of 9,432 km including 4,030 km of special stages. First across the finishing line was Japanese driver Hiroshi Masuoka, who completed the special stages in 46 hours, 11 minutes, and 30 seconds. Second place was taken by last year's winner, Jutta Kleinschmidt of Germany. And third place was taken by Kenjiro Shinozuka of Japan. This year's Dakar's victory is the seventh for Mitsubishi Motors since the company began competing in 1983. The photograph shows the celebration at the finish.

Previous page (bottom)
Hiroshi Masuoka's Mitsubishi PAJERO powers through desert terrain toward the finishing line of the 2002 Paris-Dakar Rally.

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Contents

Customer Oriented Innovation as a Goal of Engineering

Ulrich W. Walker
Senior Vice President

At MMC, we are reforming our corporate culture at full speed, to revive the company under our Turnaround Plan.

People say MMC has been an engineering-driven company, and as a matter of fact, MMC has invented many remarkable innovative technologies thanks to its superior engineering and introduced them to the marketplace.

Although we have very competitive engineering capabilities especially in the power train as well as drive train, why is MMC currently forced to restructure to survive?

The answer is in customer's hand. New technology must bring merits to our customers, such as more convenience or better performance. At the same time, it should result in greater economic efficiency and reduced environmental impact.

Needless to say, customers select their cars based on complex buying criteria such as brand, price, design, dimension, performance, economy, environmental-friendliness, etc. A car which has only superior technology cannot be a best seller.

Of course, engineering capability will be still the one of most important factors for future survival, but we must abandon those technologies which customers do not regard as worth their price as well as those technologies which do not reinforce the MMC brand. Instead, we should depend upon outsourcing from companies with specialty in technologies.

We also must be able to predict those future technologies which customers will think are worth paying for, as well as future market trends, including competitors' strategies.

Therefore, it will be much more important to improve our market research activities as well as crossover activities between engineering and marketing.

Also, we have to clearly define our brand value as well as brand commitment to customers, and transform these principles into engineering guidelines as concretely as possible. Otherwise, we can not offer distinctive products with distinctive technology.

MMC's ultimate goal must be to offer exciting products to customers worldwide based on the appeal of the MMC brand. Therefore, we must develop vehicle technologies which excite and please customers. To create appealing technologies, engineers must have passion.

The growing integration of Seeds "Engineering" and Needs "Market" is feasible only after the realization of the above actions.

However, we should not forget the importance of production engineering as well as a production system that provides models with the highest-level of quality and reliability at the most competitive cost.

The Quality Gate system, which has been newly installed in MMC, assures the quality of our products and minimizes the gap between product concept and the actual product.

However, this system can be effective only based upon the consistent discipline of all its members.

In carrying out all these activities, we shall fully utilize the benefits of the alliance with DaimlerChrysler and harmonize it within MMC's engineering culture, to make MMC a unique Japanese automobile manufacturer with global competence.

Then, our Turnaround will be truly accomplished and we can prepare ourselves for the post-Turnaround future.

TECHNICAL PERSPECTIVE

Towards Enhanced Safety – Technology Innovation and Future Efforts –

Yoshihiro GOI* Yuusuke KONDO** Isamu NISHIMURA**
Tetsushi MIMURO** Keiichi YAMAMOTO*** Yasushi CHIKATANI***

Abstract

In 1769, Cugnot's steam-powered vehicle crashed into a wall during a test. This accident which occurred in France can be regarded as the first automobile accident. Almost a century later, Great Britain introduced the first legislation established to regulate automobile traffic, under the Red Flag act* of 1865.

In Japan, a variety of safety-oriented measures have worked effectively to keep the number of fatalities resulting from traffic accidents below 10,000 a year over the last decades. However, the number of the injured persons has followed an upward curve in proportion to the increase in the number of vehicles owned. Reflecting such an environment, vehicle users are becoming increasingly hardened to safety aspects, thus requiring a higher level in safety technologies and regulative standards to assure increased safety.

This article is an overview of developments surrounding car safety issues and describes the corresponding safety technologies.

*** Legislation requiring every steam-powered vehicle on public roads to run at a speed lower than 4 mph in rural areas and 2 mph in cities and to be preceded by a man carrying a red flag. It is said that the act stifled the development of the British motor car industry for as long as 30 years.**

Key words: *Safety, Accident, Crashworthiness, Pedestrian, Occupant Protection*

1. Introduction

The advent of the automobile was also the advent of the traffic accident. The number of traffic accidents continues to grow in proportion to the number of automobile units in operation. In industrialized countries, stringent safety regulations, improved road environments, and emergency services have contributed to a downward trend in traffic fatalities recently years (**Table 1**). Worldwide, however, the annual number of traffic fatalities remains close to 500,000 (source: 1996 estimates from the International Road Traffic and Accident Database) and is expected to grow as motorization continues throughout developing countries. In Japan, the annual number of traffic fatalities has leveled off and slightly decreased but there has been no significant change in the number of injuries per unit in operation. Consequently, injury numbers continue to grow in line with increases in the number of units in operation (**Fig. 1**).

Japan's central government has responded by outlining its Seventh Fundamental Traffic Safety Program, that includes targets for cutting traffic fatalities to an annual figure 600 less than that recorded in 2000 by 2005, lower than the 1979 figure (8,466), the lowest over past 30 years. Japan's Ministry of Land, Infrastructure, and Transport is promoting vehicle-related measures with the stated goal of cutting traffic fatalities to an annual figure 1,500 lower than that recorded in 2000 by 2010.

To achieve these fatality reduction targets by vehicle-safety measures, it is essential not only to make further advances in technologies that protect vehicle occupants in collisions but also to develop pedestrian protection and compatibility technologies that protect oth-

Table 1 Numbers of traffic fatalities in major countries in 1998

Note: Fatality figures apply to deaths occurring within 30 days of accidents.

	No. of fatalities (persons) ( ): Change from 1990	Vehicle units in operation (x 1,000)	No. of fatalities per 10,000 units in operation
Japan	10,805 (–26 %)	77,056	1.40
United States	41,471 (–7 %)	207,588	2.00
European Union (15 countries)	42,400 (–25 %)	206,018	2.06
France	8,918 (–20 %)	29,487	3.02
Germany	7,792 (–29 %)	49,586	1.57
Italy	6,326 (–12 %)	37,836	1.67
United Kingdom	3,581 (–34 %)	28,140	1.27
South Korea	10,416 (–27 %)	12,966	8.03

Source: International Road Traffic and Accident Database

* Environmental & Technical Affairs Dept.
** Advanced Engin. Concept Dept., Advanced Electrical/Electronics Dept., and Safety Test Dept., Car Research & Dev. Office
*** Vehicle Research Dept. and Function Testing Dept., Truck & Bus Research & Dev. Office