
Comfortable earth moving machinery

Knowledge and experiences from the Eurocabin project

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Price: EUR 20 excl. VAT

ISBN 90-6743-977-0

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Editors:

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Print:

PlantijnCasparie Heerhugowaard

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15 Following the automotive industry

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15.1 Introduction

Designers of wheel loader and excavator cabins generally take a sharp notice of design trends in the automotive industry. Though strongly functionality based, the interiors of construction vehicles also follow design trends that can be seen in the automotive industry. Heavy equipment should also have a comfortable car-like cab. Because the automotive industry is most advanced in investigating future design and in setting design trends, it pays to take a look at trends in the automotive industry and what can be expected in future vehicle interiors.

Some general design trends and trends in automobile design, including examples of several concept cars, are explained below.

15.2 General trends in design

At the beginning of the 21st century design magazines, like the Japanese *Axis*, considered the current trends in design as well as the possibilities for the future. First of all, technological advances in the 21st century will realise things we cannot now imagine. Many products that are developed today, could not have been made until just several years ago.

Secondly, people from outside the designing industry will be designing things and the consumer's status will not be as purchaser, but as trend-setter for design. You could even say each consumer will become a designer. An example are the guest rooms in a London hotel, which are done in white without intense colouring for the most part. Guests can design their room by selecting the colour of the room's lighting. As all the guests choose their own lighting, which can also change very easily, they together are the 'designer' of part of the hotel's presentation to the outside world. Further, art and product design are moving closer together and design itself will blend more completely into daily living.

Thirdly, as thought and sensibility become more important to design, we will require the act of designing to give more consideration to all five senses. Even the feeling of how food goes down your mouth is likely to become a subject of design. The object of design will shift from objects to more conceptual, philoso-

phical aspects. As the virtual world progresses, people's desire for the physical will increase.

Finally, one of the current trends is that working space, which became separated from living space during the industrial revolution, is returning to the home thanks to the IT revolution.

15.3 The general trends in automobile design

In automobile design the advances in technology will become evident in the ways of control, the 'intelligence' of the car and the use of cameras and monitors. Technology also creates possibilities for the consumer to become a designer of the car interior. The trend of the disappearing separation between working space and the home results in the creation of cars as a 'home-away-from-home'. This trend is also connected to the worker's desire, when spending long hours in a confined space be it an office room or a cabin, to create a pleasant environment, a home-away-from-home as the truck cab in figure 15.1 shows.

The ways to control an automobile are expanded by driving by wire, joystick steering and force feedback. The way to control the information presented to the driver has endless possibilities. The Seat Salsa Emoción, for example, has a big Plexiglas bubble that covers the entire dashboard, including its information area. A trackball on the steering wheel regulates all the data projected on to the surface of the bubble from the inside.

The cars of the new millennium are increasingly attractive and ever more intelligent, with the aid of cutting edge technology. Accident prevention systems might eliminate the need for cumbersome protective structures (thereby leaving more room for the car's occupants). A Johnson Control concept cabin is fitted with electric seats which adapt 'bio mechanically' to



Figure 15.1 On the road in a 'home-away-from-home'



Figure 15.2 The Volvo Safety Concept Car makes adjustments to the interior based on the eye position of the driver

their occupants body. The Volvo Safety Concept Car recognises the driver's eye-position and adjusts the steering wheel, the floor, pedals and console automatically to create a safe sitting position. The driver can fine-tune the adjustments afterwards. Figure 15.2 shows the Volvo SCC.

The use of cameras and monitors will replace mirrors and elements such as dashboard lights.

The transparent dashboard of the Lancia Nea concept car houses five monitors (see figure 15.3): the one behind the steering wheel displays information such as driving speed, others the view from the rear relayed by the cameras. The one on the central unit is a services monitor. The safety concept car by Volvo has hood and trunk cameras and the Nissan Fusion has a main VDU



Figure 15.3 The dashboard of the Lancia Nea contains 5 monitors

which sits on the dashboard between two tiny screens that are connected to cameras that replace door mirrors. The driver's position in the Citroen Osée in which he sits between the two passenger seats, is possible because of the built-in cameras.

In the future, our cars will become a sort of blank sheet on which we shall be able to use the car's computer system to 'design' our own dashboard, our own cabin, our own colour scheme much as we do now on our computer screens. The roof of the Nissan Fusion, for example, seen from above or from inside the cabin, looks like a glass dome (see figure 15.4), at the centre of which 'floats' a sheet of Plexiglas incorporating optic fibres which allow the driver or his passengers to change the colour of the interior lighting at will. It allows them to choose a lighting scheme to suit the mood of the moment, so that they become their own interior decorators and can create the interior décor that suits their mood at the time, similar to the guests in the London hotel. On the other hand, the desire for flexible production offers possibilities for design by the consumer as well. The entire body work of the Ligier Be Up (the wearable car) has been designed with a 'wardrobe' of elements that can be combined in various ways (see figure 15.5). Another invention designed for maximum flexibility is the 'super integrated cockpit': an integrated modular cabin that includes the dashboard, storage unit and the seats. This structure is mounted on a central magnesium crossbeam equipped with a system of flat cables and a plug and play assembly style that allows for the rapid updating of electronic systems.

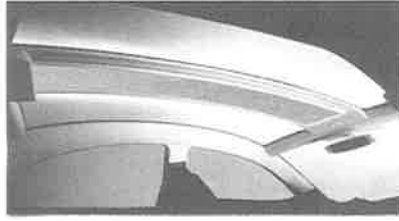


Figure 15.4 The roof of the Nissan Fusion incorporates optic fibres that change the colour of the interior at the passenger's will



Figure 15.5 The entire body work of the Liger Be Up has been designed with a 'wardrobe' of elements that can be combined in various ways

The difference between working space and the home will disappear. The Johnson Control cabin is a sort of multimedia living room where people can work or play games (figure 15.6). It is an extension of the home and the office. The core concept of the Lancia Nea is the creation of a 'home-away-from-home' in the cabin around which the rest of the car is developed and Ford's vision is that of a practical, driving communication centre.



Figure 15.6 Johnson Control developed a sort of multimedia living room where people can work or play games

15.4 Other trends in automobile design

Other trends in automobile design are the attempts to add more space to the interior or at least to the feeling of more space. Barriers between the interior and the outside world are eliminated. On the other hand, there are designers that aim for a wraparound interior.

Designers are trying to add more space to the interior. The Johnson Control cabin trim was designed to take up the least possible space (see figure 15.7). The Nissan Fusion was designed to offer a particularly spacious interior. In the process the designers came up with a way of expanding the cabin while reducing the front and the rear overhangs. In the Citroën C5 every effort has been made to

make the car look larger than it really is and the whole interior is exceptionally spacious. In the new Ford Mondeo 50 mm was added to the wheelbase, to allow the designers to optimize the interior package and create an even roomier interior.

New concept cars look as if the barriers between the interior and the outside world have been eliminated. The Lancia Nea bodywork looks generously proportioned but almost see-through, thanks to the big glazed cabin roof. The Volvo SCC has a different starting point - safety - but the effect of the reinforced Plexiglas A-pillar has a similar effect, as does the extension of the windscreen to the roof in the Nissan Fusion.

Between all these roomy aspects, designers want to create a wraparound feeling as well. When the door of the Nissan Fusion is closed, the panel and the dashboard elements come together to create a wraparound shape (see figure 15.8).



Figure 15.7 The sophisticated yet linear and minimalist cabin trim was designed by Johnson Control to take up the least possible space



Figure 15.8 The wraparound interior of the Nissan Fusion

15.5 Conclusion: usability for heavy equipment

General design trends have already found their way to the concept cars of the automobile industry. The glass roof can already be found in production cars from Mercedes and Peugeot. Obviously wheel loader and excavator cabins differ from automobile cabins in a number of ways. For one thing the functional requirements differ widely. Also controls differ from the automotive industry. Nevertheless there are several examples of innovations in earth moving machinery that were first seen in automotive industry such as plastics for dashboards, air-conditioning, low sound levels and curved windows.

Further it is to be expected that seat and control adjustment will become electronic, cameras will replace mirrors and multifunctional screens will become standard in the operator's cabin.

In general it is safe to conclude that with the increasing comfort level of cars and their number of accessories, so will the operator's wishes increase to minimize the difference in comfort level between cars and machine.

Equipment manufactures will therefore need to closely watch developments in automotive industry.

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