

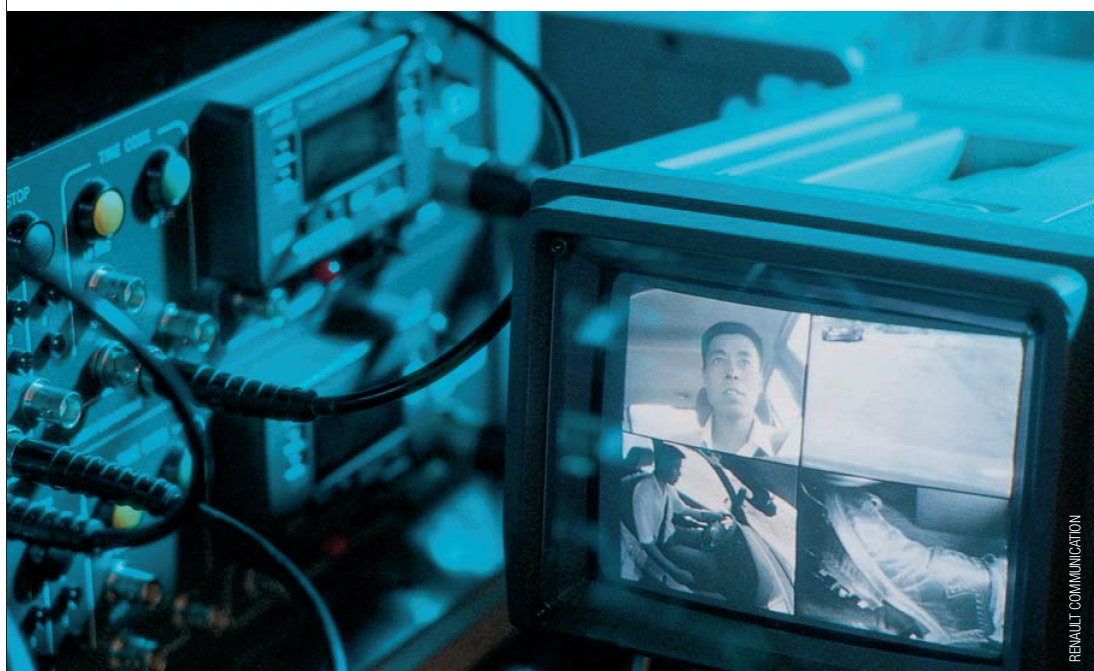
# CUSTOMISING THE VEHICLE

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**Although a made-to-measure vehicle remains a dream, electronics, increasingly present in vehicles, is gradually bringing this concept closer.**

Already, the handsfree card is able to memorise certain elements of cabin ergonomics for several users and restore them when a new driver sits behind the wheel.

Soon, suspension systems, steering, gearbox and even engine behaviour will be able to adapt to the driver's temperament.



▸ Safety

▸ Environment

▸ **Life on board**

▸ Mobility

▸ Competitiveness

## BASIC FACTS

**Large-scale production remains the pivot of automobile economics.** This type of production cannot therefore directly meet the manufacture of made-to-measure vehicles. However, the increasing use of onboard electronics will eventually enable many systems and functions, even vehicle behaviour, to be customised.

The cabin has already benefited enormously from this evolution. Air conditioning or car radio settings can be memorised and called up without user intervention. But these are still only parameters based on physical comfort. Auto-adaptive gearboxes (see sheet), such as DP0, SU1 or Quickshift, are anticipating the extension

of customisation to the overall behaviour of the vehicle. They are able to modify their gear changing laws to the reactions of the driver. This customisation may soon also concern the behaviour of the engine and, more widely, the dynamics of the car, to adapt it to the driving style of each user.

## IN SHORT

**INCREASINGLY PRESENT IN CARS, ELECTRONICS WILL SOON ENABLE THE PERSONALITY OF THE VEHICLE TO BE ADAPTED TO THE TEMPERAMENT OF THE DRIVER. AS WELL AS CABIN ERGONOMICS, CUSTOMISATION WILL INVOLVE THE VERY BEHAVIOUR OF THE CAR.**

## HOW DOES IT WORK?



**Whether it be the injection, the gearbox, braking, steering assistance or comfort functions,**

each component of the car is managed by a specific computer, or ECU. All ECUs base their decisions on "tables of law", themselves based on parameters stored in their memories. Modifying these basic parameters affects the decisions made by each ECU and consequently, directly influences the actions, or reactions, of a specific function.

In addition, these ECUs are often interconnected and dialogue permanently. By acting also on this dialogue, the whole behaviour of the car becomes "modular".

Hence, as well as that of the gearbox, the behaviour of the engine can be modified by means of the injection ECU, among others, to give it a more responsive, or inversely, a more flexible temperament, according to the desires of the user.

The steering can also become either more direct or low-g geared, by modifying the degree of response of its steering assistance. The stiffness of the suspensions is also accessible and, overall, the whole dynamic behaviour of the car becomes adaptable.

Finally, the arrival of "x-by-wire", where electrical connections

replace the cables and belts and current hydraulic circuits, offer even greater customisation possibilities by separating the mechanics

of the control elements, such as the pedals or the steering wheel, from those controlled. Renault is equipped with extremely powerful driving simulators to better understand driver behaviour. These simulators are able to place drivers in very realistic driving situations to precisely analyse their reactions without risk. These extremely accurate analyses are being used to create the capacity for auto-adaptation of the vehicles of tomorrow.