Finding the Perfect Gearshift

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A push of a button, release the brake and the car drives away. Allowing all focus to be spent on evaluating the gearshift that will come. This is the new way of performing comfort tests for an automatic gearbox.

Car manufacturers are always trying to improve the performance of their products. In order to beat the competition every detail is important. The main purpose of an automatic gearbox is to make it easy and comfortable to drive the vehicle. The driver should just decide if the vehicle needs go faster or slower and not even be aware of the gearshifts. A lot of time and energy is therefore spent on testing how the gearshifts can be made as smooth as possible. In order to find the perfect setup for the gearbox, the same test must be run over and over again by different drivers and in different cars. This variation is supposed to prevent a biased result that could be caused by a bad vehicle or a test-driver with another acceptance level.

To help the test drivers perform the same test repeatedly, a tool has been developed at IAV called the Drivebox. It can replace and take over the signal sent from the accelerator pedal in a car. This allows the Drivebox to "control" the accelerator pedal. A new feature has been implemented into the Drivebox, which allows the Drivebox to perform a test sequence. A test is executed by splitting it up into smaller parts. Once a shift has been executed the test-driver needs to evaluate the shift before the next shift is started.

The interface between the Drivebox and the user has also been changed. It is now possible to control the Drivebox from the program that supervises the test, Caltet. Previously, the user was required to manually control the Drivebox via a touch screen. The initialization process and the execution of a tests are now run in the background of Caltet.

When the test can be run automatically the test driver does not have to focus on performing the right test sequence. Instead the attention can be directed at rating the gearshift. The test sequences will also always be performed in the same way, even if the driver or car is changed. This makes the evaluation of the shift more unbiased. Which in turn leads to better data for calibrating the gearbox.

This new way of performing the tests will hopefully lead to an increased comfort level in future cars with automatic gearboxes. It may also decrease the test time, since the test-driver only needs to rate the shifts the car performs.