Automatic Validation of Diagnostic Services on the Opel Insignia

Case Study GM Europe

The Customer

General Motors is an automotive corporation with global operations that include Opel and its international devel-op-ment center in Rüsselsheim. That is where the new Opel Insignia – a successful model and „Car of the Year 2009" was developed.

The Challenge

Increasing efficiency in validation of diagnostic services

The Opel Insignia has considerably more ECUs than did the previous model, and testing effort is clearly higher by compa-rison. Wide-ranging automation of testing and validation of diagnostic services hold promise for substantial savings potential. Another goal was to equip suppliers with the ability to conduct testing at their own facilities over the course of development.

The Solution

A tool for automated generation and execution of diagno-stic tests

The CANoe.DiVa tool automates validation of diagnostic services. CANoe.DiVa is not just tailored to a specific auto-motive OEM, but it enables OEM-specific modifications and extensions by configuration and/or plug-ins.

Test cases and the test specification are generated based on an ECU-specific diagnostic description. In CANoe, these test cases are executed, and a comprehensive test report is generated. In analyzing the test report the user is optimally supported by various views and filters.

The GM diagnostic specification defines 350 test sequences. About one-third of these test sequences are „good case" tests, and two-thirds are „bad case" tests.

These GM-specific tests were integrated in the CANoe. DiVa product in close cooperation with Opel. About 80% of the test sequences are fully automated in their execution, and about 15% require user interaction.

The Advantages

Clear efficiency gains in diagnostic validation

The engineers at Opel have systematically compared testing effort on the new Insignia with testing effort (manual or semi-automated) on the Corsa:

When errors are found in early development phases, testing effort is reduced by a factor of 4. In late development phases, when testing is run as a regression test, savings can amount to as much as a factor of 20.

The solution is very cost-effective: All that is needed are licenses for CANoe.DiVa. Existing Vector CAN communica-tion hardware can still be used.

The results were convincing: All new ECUs at GM and its suppliers undergo diagnostics validation with CANoe.DiVa.
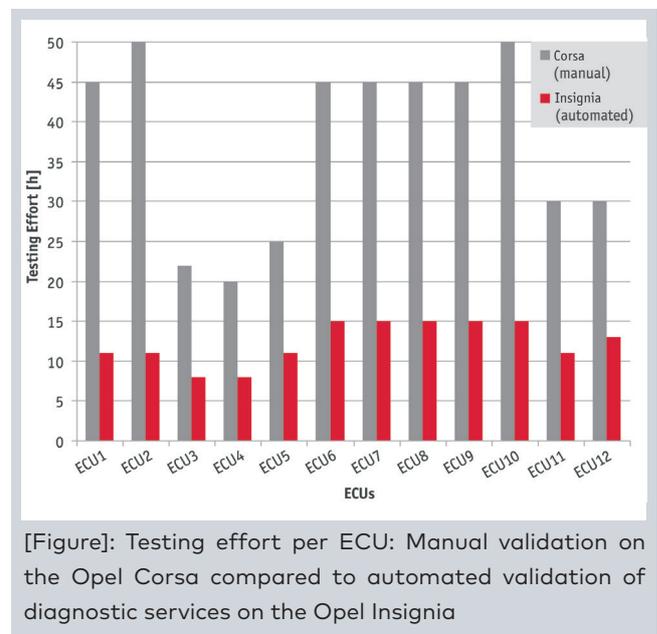
[Figure]: Testing effort per ECU: Manual validation on the Opel Corsa compared to automated validation of diagnostic services on the Opel Insignia