19SKSAE_A010

Simulation-based improvements in diagnostic communication software design quality

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Key words : diagnostic, communication, simulation, controller, tool, validation

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The need to strengthen vehicle system safety in the automotive industry has been rising increasingly in recent years beginning from the implementation of ISO 26262 (Road Vehicles –Functional Safety).

Vehicle manufacturers are also requiring enhancement of diagnostic communication functionality accompanying higher powertrain performance, while at the same time they are requesting shorter development lead times. Amid these circumstances, there is a risk that the following problems may occur in the conventional development process for diagnostic communication software.

- There are times when not all communication cases are written in the required specification documents, and such specification deficiencies are not discovered until the validation phase using actual hardware.
- After the required specifications have been incorporated in the software, the actual controller and diagnostic tools are prepared and validation is undertaken. There is a need to shorten the time from the discovery of the specification deficiencies to the revision of the software.

In order to avoid these risks, building a simulation system for diagnostic communication can enable prior detection of some design defects at the stage of conceptual design (Fig. 1).

It is also expected that simulation will be effective in validating exceptional case behavior, such as a memory failure, that hardly be generated with an actual controller.

This article presents a method for examining design specifications by simulating part or all of a diagnostic communication system and describes the benefits obtained with this simulation method.

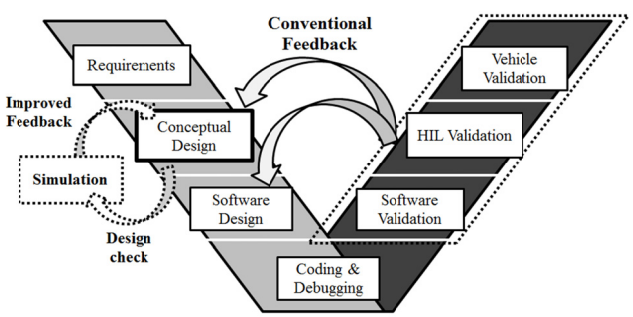

Fig.1 Improvements on software process by simulation method