

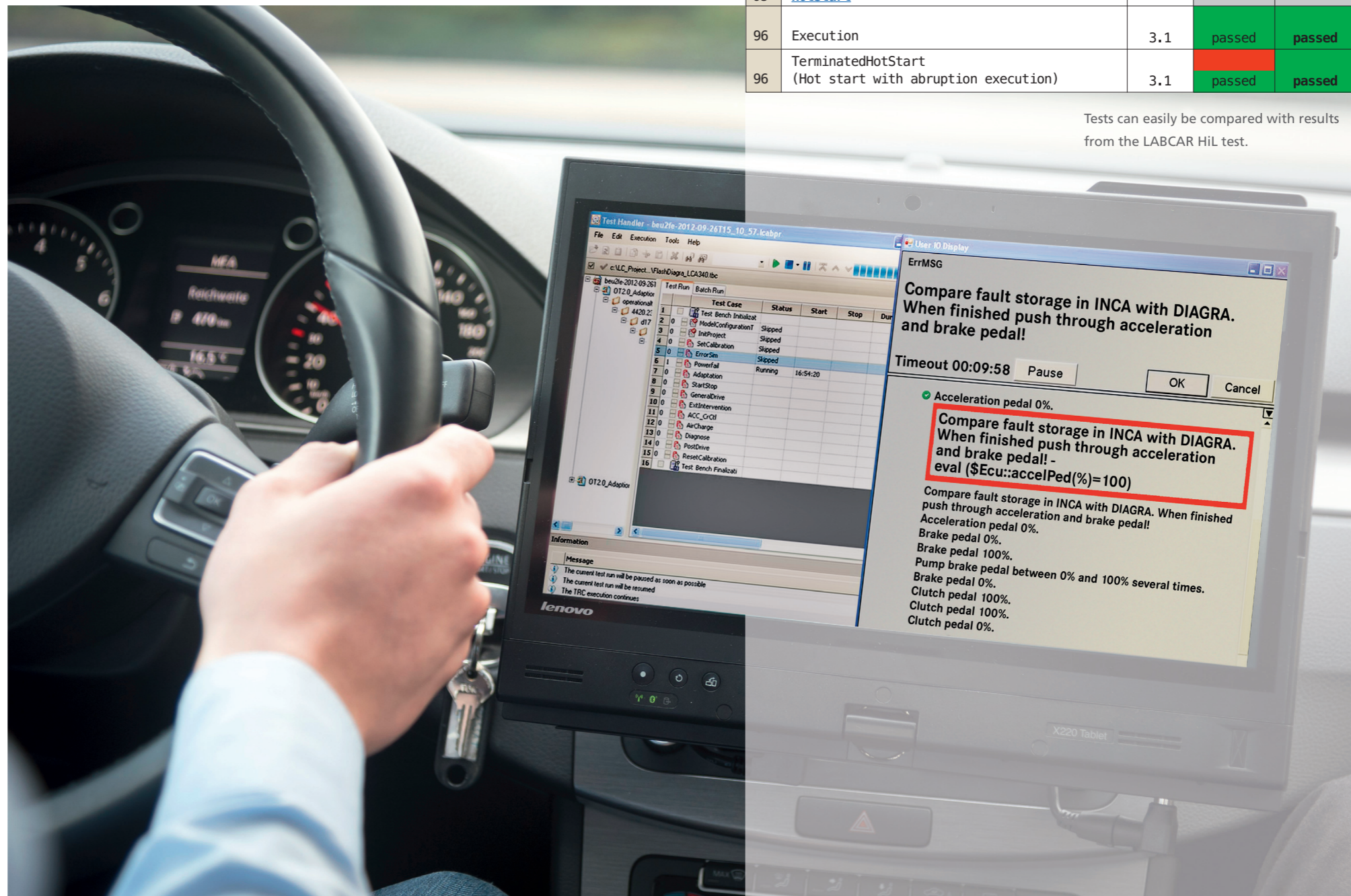
Smart, Interconnected Tools

When a test vehicle turns test assistant

“Start the engine. Select gear and accelerate to 2,000 rpm,” the driver is told. But the man behind the wheel is no novice, in fact he’s a professional. The instructions are for Martin Bauer, an experienced driver and developer of software tools and methods. He executes the release test of the latest software version for an engine management system and its data set – and it is the test vehicle itself issuing him instructions, based on ETAS LABCAR-AUTOMATION test cases.

It’s a sunny morning on the Bosch test track in Schwieberdingen. A red demonstrator vehicle is putting the latest software version of the car’s engine management system through its paces. But instead of having to work through the usual lists of required test cases himself, the driver is assisted by the vehicle – or rather, by the “Test Automation for Car” (TAC) system developed by Martin Bauer and his team. Each test step appears on a display screen and is accompanied by instructions such as “Accelerate the vehicle to 40 km/h” issued over the laptop’s sound system. With TAC assisting him in this way, Bauer can fully concentrate on the test drive and how the vehicle is responding on the track. The system makes documenting the tests easier, too. All the important parameters are recorded automatically, and any results that lie outside the permitted range are automatically flagged for review. Not only is this method of testing more efficient, it also documents and evaluates results more quickly. “It really cuts down the effort required for these routine tasks, and saves a noticeable amount of time, which is a major advantage when

testing expensive and rare demonstrator vehicles,” says Bauer. As Development Project Manager for test automation he always focuses on the objective of the EAM department: to increase the calibration efficiency worldwide – even beyond day-to-day tasks. All test cases are created by the various testing teams using the ETAS LABCAR-AUTOMATION tool suite for automated testing and are then run in the ETAS LABCAR-OPERATOR testing environment. This means there is no need to modify them before they are used with the ETAS LABCAR HiL system or in the vehicle. This consistency links the information across both domains and continually increases knowledge regardless of who does the testing. And this kind of repeated use itself saves a lot of preparation time and improves quality. Meanwhile, interfaces to ETAS’ INCA calibration tool and ES590 Interface Module can be used in both domains without modification. It may sound simple, but there’s a lot of expert knowledge behind TAC. It can only work reliably and perform well if all components and tools interact smoothly. Experts



from Bosch Diesel Gasoline Systems are working closely with Bosch Engineering and ETAS to ensure this is the case.

“Our successful collaboration and the open nature of the ETAS tools are among the main reasons why TAC works so well,” affirms Martin Bauer. “What we do here every day confirms that our smart networking of the various systems has noticeably improved the efficiency of our work. This really spurs us on!”

	A	B	C	D
1	Testcases	TestID	LABCAR	Vehicle
91	CatDiagnostic_1_Bank_System_KATmin (Catalyst diagnostic)	12.10	failed	failed
92	ZuendwinkelverlaufimStartundNachstart (Ignition angle gradient)	4.10.2	failed	passed
93	LSF_1_Bank_System (Lambda heating upstream sensor LSF)	6.11.1	passed	passed
94	FrontO2Sensor_LSF_1_Bank_System (Lambda sensor front – operating state and sensor value)	6.14.1	failed	passed
95	HotStart			
96	Execution	3.1	passed	passed
96	TerminatedHotStart (Hot start with abrupt execution)	3.1	passed	passed

Tests can easily be compared with results from the LABCAR HiL test.