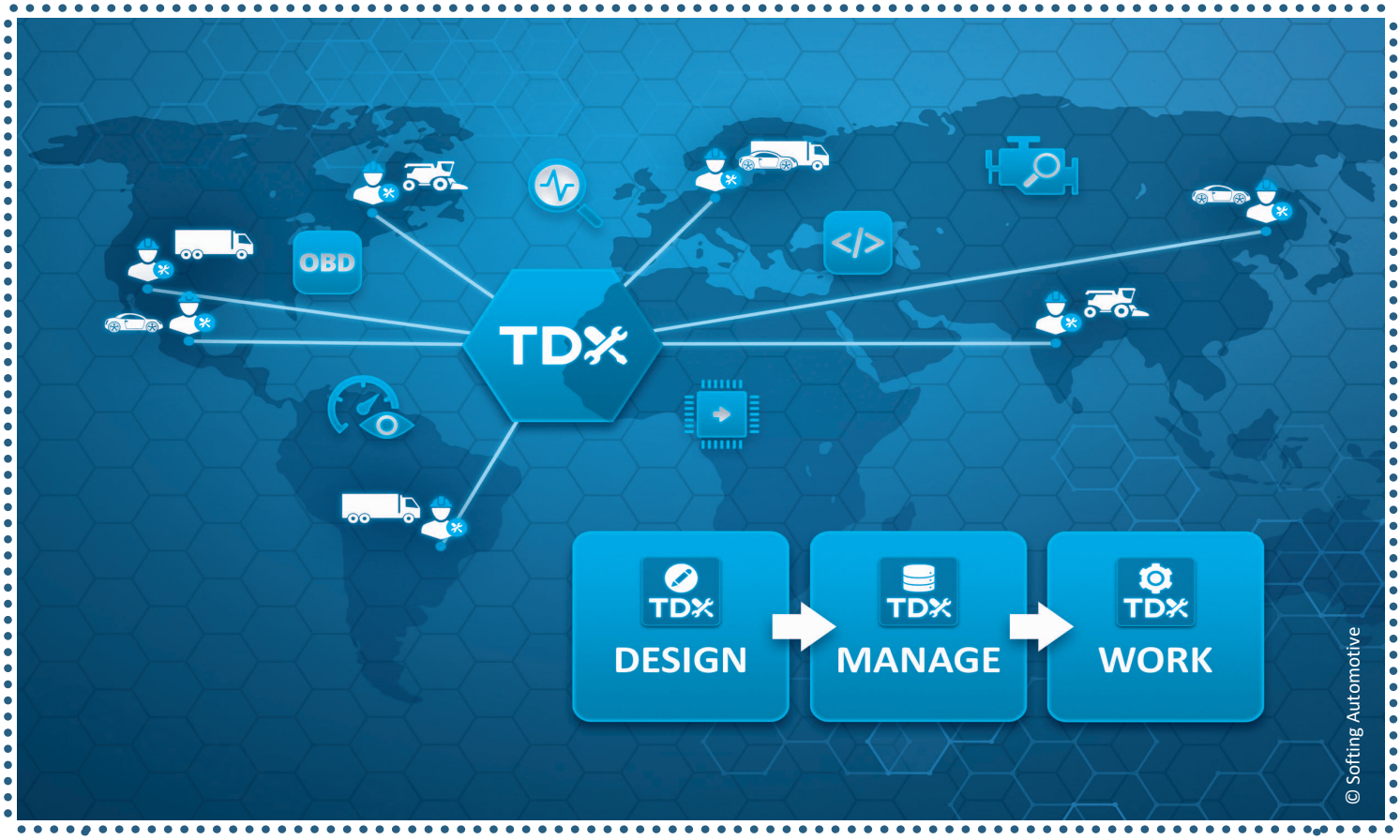


# The Machine Has To Work!

**After-sales service provides service networks for vehicles and machinery – often on a world-wide scale. These generally pursue one goal: to reduce downtimes and thus the total cost of ownership (TCO). The core business includes fast, targeted maintenance and repair. This not only requires the use of an efficient repair shop tester, but also places special demands on its worldwide availability and updatability via a modern back end.**

Closely synchronized supply chains and tight schedules are standard today, something that naturally increases the pressure on the availability of transport fleets as well as working and agricultural machinery. Any delay causes high additional costs. To avoid this, the worldwide, highly dynamic use of efficient maintenance and repair services is essential. For this purpose, OEMs and system suppliers maintain a large number of service repair shops worldwide or send out mobile service technicians – the repair shop comes to the machine. When it comes to maintenance, it is important to process service plans efficiently and replace parts subject to wear in good time. In the case of a repair, the mechanic must be able to analyze the fault pattern as quickly as possible in order to take appropriate measures. This often entails an update of the ECU software with the latest release status for a specific vehicle. All these tasks require comprehensive tool support serving the specific requirements of after-sales.

## Basis for Efficiency and Functional Capability for Years

To ensure a maximum degree of efficiency, the operation of the service tester must be as appropriate as possible to the task at hand. For

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maintenance purposes, current parameters are regularly read out, recoded and error memory contents checked – depending on the maintenance procedure. The update is performed by reprogramming one or more ECUs. When a repair is necessary, the fault is first localized, then a specific remedy is determined and carried out, and, in the last step, the success of the repair is verified. The service tester requires diagnostic functions for all these tasks. The most important functions include:

- Vehicle identification
- Error memory operations
- Parameterization/coding
- ECU exchange
- ECU programming

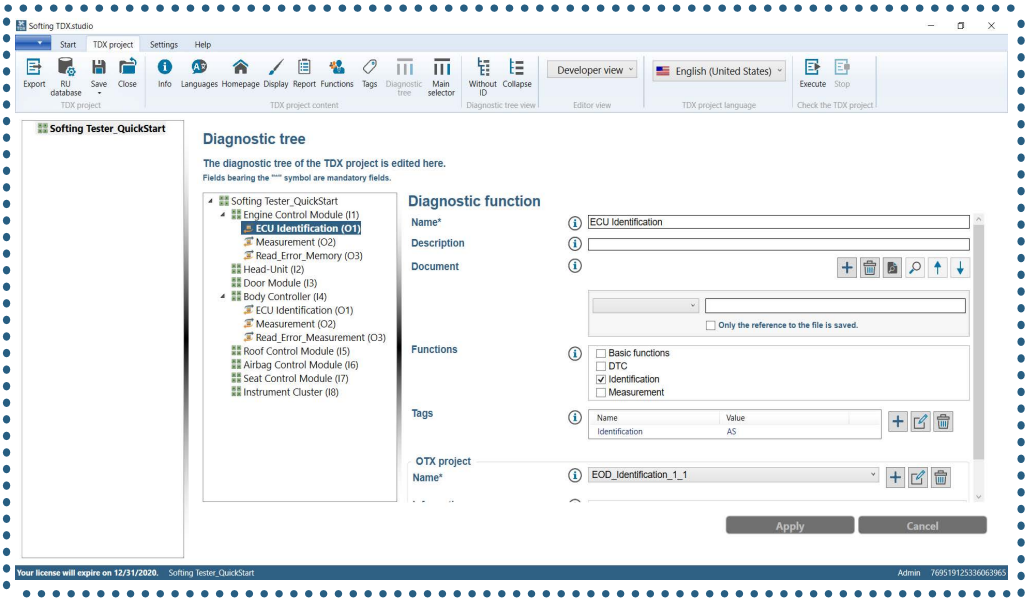
Depending on the error symptom, the most efficient way of localizing the error may be, for example, direct access to ECU information or commencing with a symptom, via which guided troubleshooting or intelligent algorithms will lead to the cause. The actual repair is usually carried out using repair instructions with supporting exploded drawings or videos and access to web content. This content is usually not static: New series and ECU variants require regular updates. This requires a powerful back-end infrastructure, through which, preferably, only the relevant new features are transferred to the repair shop system. The respective access rights also have to be managed; after all, it is often the case that not every repair shop employee is allowed to perform all functions – such as ECU programming.

## Additional Benefit thanks to a Dedicated Workflow

So, to put it in a nutshell, the challenge is to: Provide repair shops worldwide with prompt access to control-unit and problem-specific repair procedures in their own language, taking security aspects into account. To enable this, the Softing TDX toolbox implements the intuitive workflow DESIGN – MANAGE – WORK. This is very well suited to create a service tester independently, roll it out successfully throughout the company and maintain it.

### DESIGN - Diagnostic Content, Operating and Maintenance Concept, and User Interface

The DESIGN of a flexible diagnostic solution is taken care of with Softing's TDX.studio, which can be used to independently implement new operating concepts for the diagnostic tester. User interfaces can be designed completely individually from the design of a high-end interface, like current vehicle dashboards, to the complete adoption of a proprietary corporate design (CD). Underlying processes, be it guided troubleshooting or the pure test procedure, are also designed here with an intuitive engineering/development environment. Softing TDX.studio also integrates additional information, such as repair instructions, exploded drawings and external websites, into the projects. This is done flexibly at different hierarchical levels so that certain content is only available in certain projects. This enables a multi-brand tester from just one tool.




Softing TDX.studio also defines the different languages in which the repair shop tester is presented. For mandatory reporting, the engineering/development environment offers an efficient way to not only generate reports, but also to adapt them to suit individual requirements. Thus the solution in DESIGN adapts itself optimally to the respective needs.

Figure 1: Creation of the diagnostic tree in Softing TDX.studio



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Figure 2: Application example of the workshop tester Softing TDX.workshop

### MANAGE – Distribution Package, Software and Diagnostic Content Update, Access Rights

The administration component of the TDX toolbox, Softing TDX.admin, takes care of the MANAGE part of the workflow, in which, among other things, roles and user-specific rights of the repair shop tester operators are defined. A high degree of flexibility is ensured by the distinction between program functions and project functions, which are activated user-specifically and regulate the user rights in the repair shop tester using role keys. Management is taken care of by a central database, with which the role keys and certificates can be automatically distributed and maintained in the field. The database is also responsible for the update of software and content.

### WORK – Using the Diagnostic Tester for Maintenance

WORK implements the actual repair shop tool Softing TDX.workshop and unites all the benefits. Softing TDX.workshop offers optimal support for every mechanic – from guided troubleshooting to ECU exchange and update. This is where the operating philosophy defined in DESIGN becomes apparent. The project and program functions displayed are based on the role model defined previously and are therefore only accessible to authorized users. Softing TDX.workshop offers automated updates for simple maintenance in after-sales service.

The content is always protected from unauthorized access as it is encrypted. This means that only authorized operators can actually use the content.

## Conclusion

The worldwide use of diagnostics in after-sales service, especially in the heavy-duty (trucks and buses) and working machinery segments, as well as their components, presents special challenges in terms of tool availability. The focus is very much on the fast and above all targeted maintenance and repair of modern vehicles and components in order to reduce costs while increasing availability and customer satisfaction. A consistent diagnostic concept consisting of a diagnostic tool and the upstream and downstream processes is required to ensure this. With the DESIGN – MANAGE – WORK workflow, the Softing TDX toolbox provides efficient tool support for this purpose, protecting your investment for years to come.

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