

OBD II-Legislative Diagnostics Verification

Per industry reports*, the number of vehicles recalled (in US alone) as part of **Emissions defects** between 2015 – 2019 ranged between 4.2 million to 7.3 million vehicles, with a max number of **8.1 million recalled in 2020**.

Electronic and computer-related defects represented more than **20%** of all emissions recalls between 2014 and 2019, with **OBD components responsible for 10.5%** of those recalls.

As software-centric systems and components continue to play a more prominent role in the composition of the modern-day automotive, emissions defects led recalls, will see an increasing proportion of electronic and software-related issues, as the underlying cause.



Electronic and software-related defects & defect-leaks | The causes

In the prevalent OEM set-up, almost the entire ECU design and software is outsourced to Tier 1 suppliers, with the OEMs being responsible for integrating these ECUs into the vehicle assembly.

- Flaws in the operating software leading to failure of related components
- Failures resulting from integration and interfacing of software with other components or systems in a vehicle

Defects primarily occur because of:

Pre-production to production leaks

Considering the ECU footprint of a new-age vehicle, an OEM ends up integrating a varied set of software code, developed using supplier specific development methodologies, operating systems, process frameworks, and data formats.

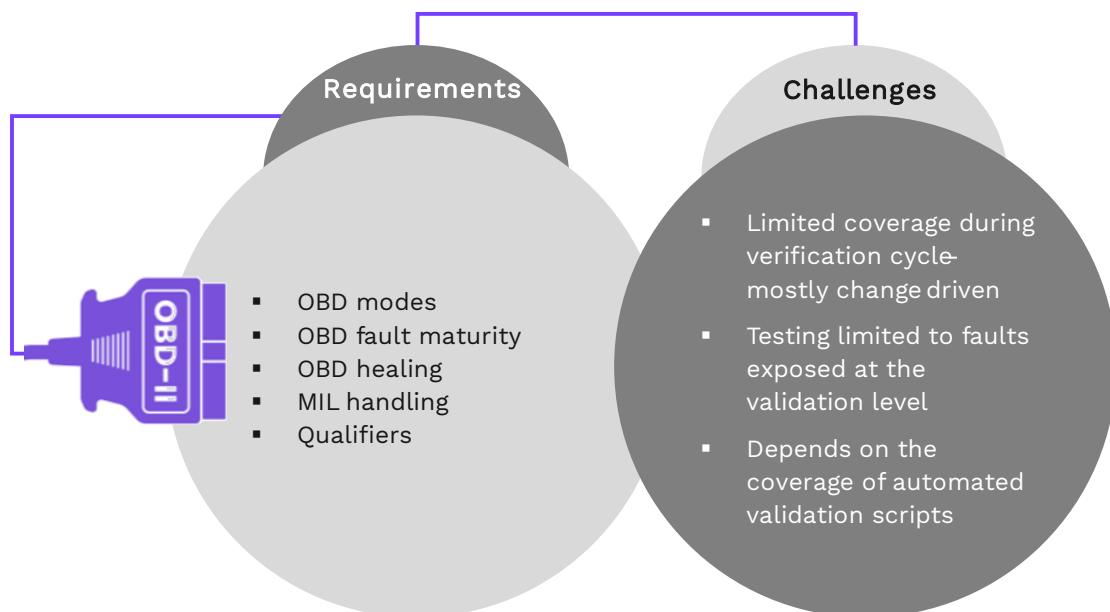
This clearly adds to integration complexities, impacting the test coverage and traceability efficacy of pre-production ECU verification and validation activities, thereby resulting in increased defect-leaks across E/E systems and sub-systems, including engine management system components.



OBD II – Legislative diagnostics verification | Challenges faced

Thorough testing of every ECU build combination before the start of production presents numerous challenges, and despite the extensive, cost, effort and time investments, defect-leaks aren't uncommon.

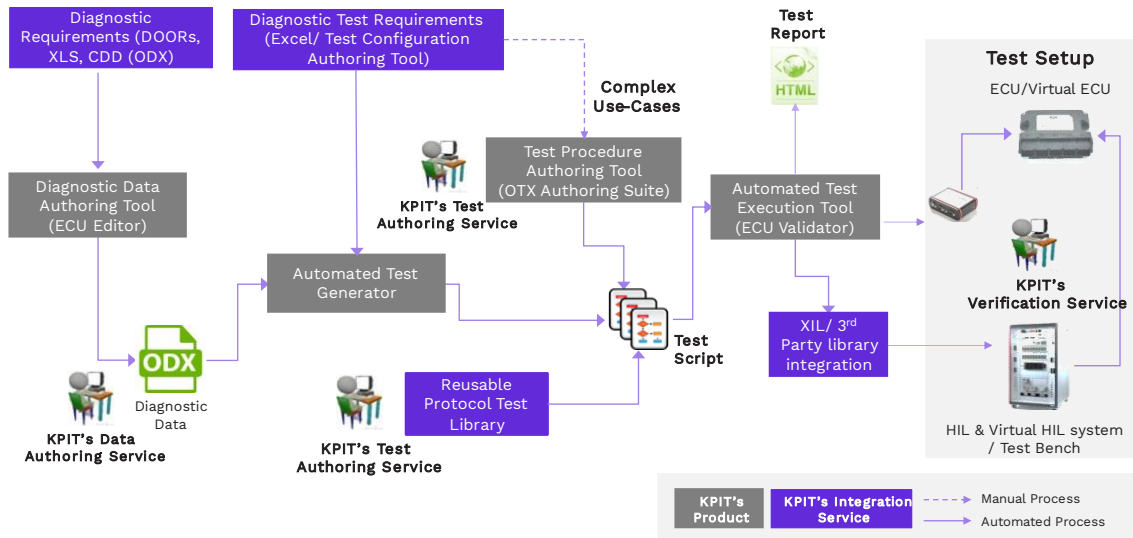
For OBD II verification and validation, it is required to test all the sensors and actuators that are present in the engine, for all possible failures. From an emissions point of view there are lists of critical failures that are caused due to malfunction of sensors and actuators.





KPIT's OBD II verification solution | A full-matrix solution

KPIT's Legislative (OBD II) validation solution follows an automated and integrated approach to achieve a 100% coverage on fault testing across vehicle variants.



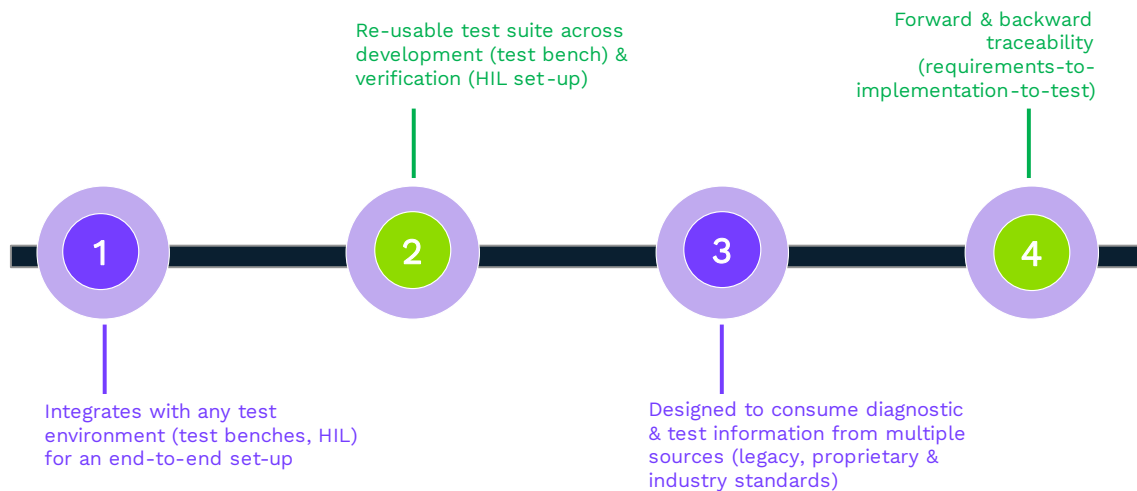
An integrated and standards-driven verification solution

The automated verification framework leverages advanced technologies and methods to integrate workflows and processes to ensure:

	Standardization of diagnostic data and test sequences		Automation of test scripts generation		Generation of generic test scripts for protocol verification and ODX faults
	Integration with test management system & variant management		Integration with CI/CD infrastructure		Test execution automation

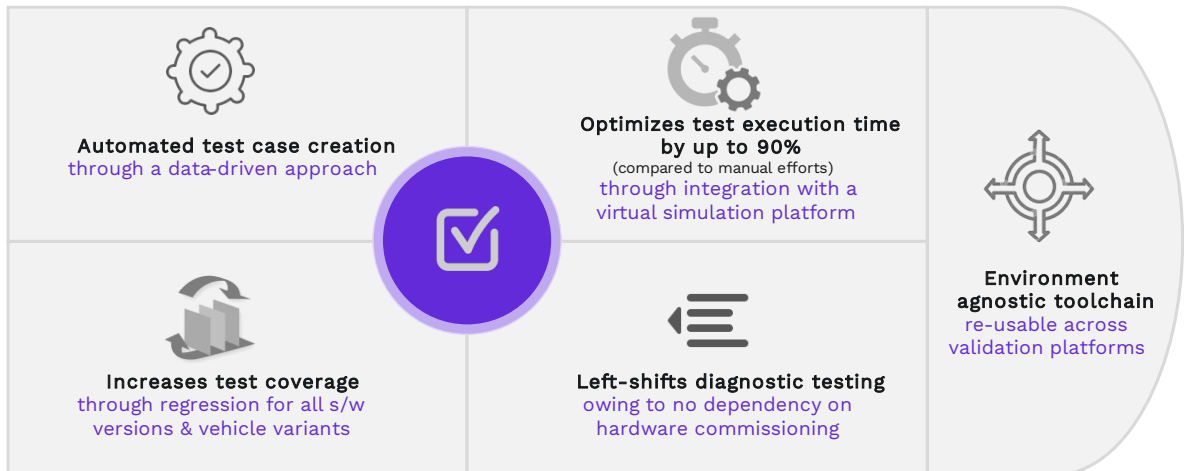


How does this solution differentiate itself?





Value Proposition



Case Study | Leading US based Passenger car Tier 1

Business Objective

A complete re-imagining of the scalable legislative diagnostics verification solution capable to mitigate current challenges and future requirements

Solution Elements	Value-Add		
<ul style="list-style-type: none"> End-to-end traceability Test configuration authoring Reusable legislative diagnostics standard test suite Automated functional test generation for OBD Modes (PIDs/MIDs) and OBD faults Automated test execution 	Data driven solution	→	No dependency to include new use cases
	Increased coverage and reduced test execution	→	70% reduction in execution efforts
Solution Features <ul style="list-style-type: none"> Centralized diagnostic data and test configuration management State-of-the-art tooling and workflow Abstraction of generic and execution environment specific details to ensure test specification reusability Seamless integration with multiple test environments 	Integrated & automated test generation and execution	→	Improved turn around time
	Standardized test suite	→	90% re-use of test cases

For additional info or queries, you can reach us at diagnostics@kpit.com

/company/kpit

KPIT is a global technology company with software solutions that will help mobility leapfrog towards autonomous, clean, smart and connected future. With 7000+ Automobelievers across the globe, specializing in embedded software, AI & Digital solutions, KPIT enables

customers accelerate implementation of next generation mobility technologies. With development centers in Europe, Americas, Japan, China, Thailand and India – KPIT works with leaders in mobility and is present where the ecosystem is transforming.