

MORPHEE PASSENGER CAR VEHICLE SIMULATION ON ENGINE TEST BED

AUTOMATION



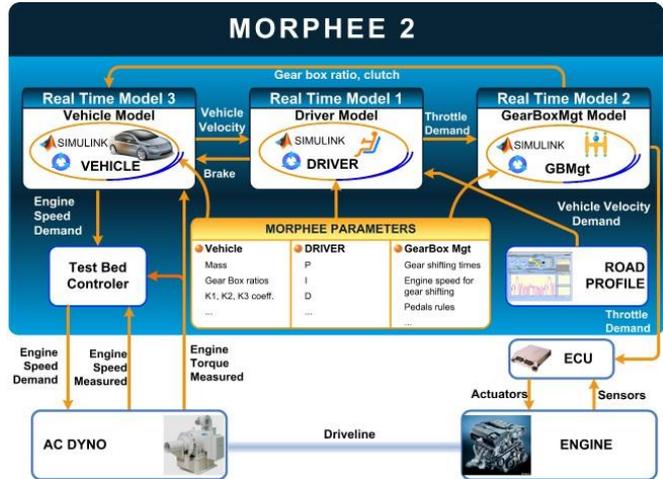
» Reduce your costs and time of engine development by performing the vehicle tests on engine test bed.

FEV offers a MORPHEE application which enables to simulate the automotive vehicle dynamics and its driver in real-time on the engine test bed. This application enables to accurately reproduce the certification procedure for vehicle test bed directly on the engine test bed. Thus, it accelerates the engine development by reducing the need to wait for the availability of the vehicle prototype.

- › Reproduction of the vehicle dynamics directly on the engine test bed
- › Reduced operating costs as compared to vehicle test bed
- › Customizable models, calculation algorithms and test procedures
- › Numerous standard test procedures available
- › Prediction of pollutant emissions on the certification cycles
- › Automatic calculation of pollutant emissions for gaseous pollutants during the test

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Technical Data

Simulated elements	
Driver	Controls the pedals position (accelerator, clutch and brake) and the gear switching management for manual gear box.
Standard	Real-time driver 10 to 100 Hz control based on PI approach
Look Ahead	Real-time driver 10 Hz control integrating anticipation on vehicle velocity demand and feed forward term
Vehicle	Simulate the vehicle dynamic
Manual Gear Box	Real-time model 500 Hz to 1 kHz with clutch slip modeling
Automatic gear Box	Real-time model 500 Hz to 1 kHz with torque converter and lockup clutch slip modeling integrating gear switching control.
Function modes	
Free/Coast Down	Vehicle simulation without controlling the test bed (verification of the vehicle simulation)
Tuning of the test bed controls	Tuning of the test bed controls to adapt to the test bed
Road Load Simulation/Accelerator pedal	Manual control of the accelerator pedal. Manual or automatic gear control.
Road Load Simulation/Vehicle velocity	Manual control of vehicle velocity demand. Accelerator pedal controlled by simulation. Manual or automatic gear control.
Dynamics tests	Execution of timed tests either with fixed gear or with automatic gear shifting
Test procedures (Add-in)	
European	ECE, EUDC, NEDC, for vehicles with manual 5/6 gears and automatic transmission
American	US06, FTP75, SC03, New York City cycle
Japanese	Japan 10 modes, Japan 10-15 modes, JC08 cold cycle, JC08 hot cycle
UNECE	WLTP
Others	Artemis urban, road, motorway
Performance	1,000 m from rest, 0-100 km/h, ...
Customizable	Test procedure defined by the user
Emission calculations (Add-in)	
Mass[g] and Specific[g/km] emissions from raw exhaust gas	NOx, CO, CO2, HC, CH4 and NMHC on test procedures, calculations according to ISO16183 Standard version of 15 December 2002.
Mass[g] and Specific[g/km] emissions from diluted exhaust gas	NOx, CO, CO2, HC, CH4 and NMHC on test procedures, calculations according to 70/220/EC Directive and EPA 40CFR86 and Japan Regulation.

Technical Specifications may be modified without prior notice. FEV-DS027-2016-MORPHEE-DS-PC