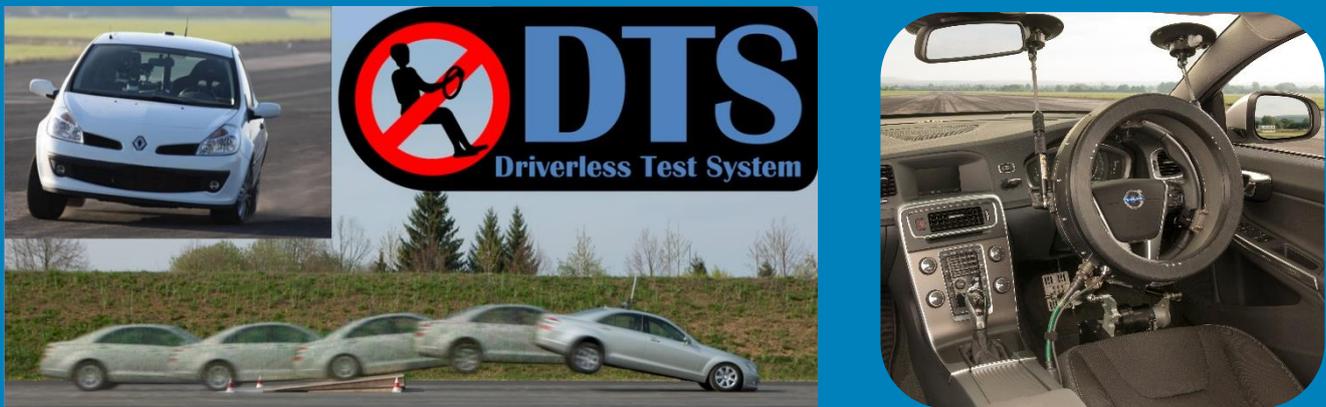


Driverless Test System

SP6021

Robots suitable for use in DTS: SR15 – SR15 Orbit - SR35 – SR60 – SR60 Torus – SR150 – CBAR – GR – CR

The AB Dynamics range of driving robots includes steering robots, brake robots, accelerator robots and a gear-change robot with clutch actuator. AB Dynamics robots have been used by clients around world since 1997 to provide reliable and accurate control inputs to vehicles for proving-ground testing. The Driverless Test System (DTS) builds upon this proven technology to allow accurate and high-speed test driving with no human driver in the vehicle.



Driverless fish-hook test (above left), driverless misuse testing (bottom), DTS CBAR and SR60 Torus installed in Volvo (above right)

The DTS also includes AB Dynamics’ Path Following system, enabling the robots to guide the vehicle along a pre-defined path with the vehicle’s position, speed and time along the path all precisely controlled. The vehicle’s position feedback is provided by a 2cm-accurate GPS-corrected motion pack. AB Dynamics’ Duramon software can be used to monitor the vehicle’s condition. High-speed wireless telemetry enables the user to supervise the vehicle from a suitable base-station beside the track.

A safety system monitors all of the critical system elements at high frequency and can apply a secondary brake actuator rapidly in case of a problem (even a total electrical failure), to bring the vehicle safely to a stop. Users can also stop a vehicle(s) from the base-station.

APPLICATIONS

With more than 30 Driverless Test Systems already supplied (as of 2017), the DTS is already being used in a wide variety of applications by AB Dynamics customers around the world:



VEHICLE DYNAMICS



DURABILITY



ADAS TESTING



MISUSE HANDLING

VEHICLE DYNAMICS	DURABILITY	ADAS TESTING	MISUSE TESTING
The full range of objective dynamics tests can be run without a human driver; reducing risk, enhancing the accuracy of the manoeuvre and improving data coherence.	Durability testing is typically arduous, physically demanding and tedious for the drivers. However, these are ideal conditions for robotised testing.	ADAS: advanced driver assist systems. Testing these systems requires the precise positioning and timing of multiple vehicles – impossible for human drivers.	Includes driving vehicles over ramps and sand-bank impacts to check airbags only deploy when they should. Very unpleasant for human drivers, but no problem for robots.

DTS HARDWARE REQUIREMENT

The Driverless Test System can be specified with any of AB Dynamics range of steering robots, together with the combined brake and accelerator robot (CBAR) – CBAR600 or CBAR1000. The gear-change robot and clutch robot can be added for use in vehicles with manual gear-shift or to operate sequential automatic gearshifts.

STEERING ROBOT	COMBINED BRAKE AND ACCELERATOR ROBOT (CBAR)	CLUTCH AND GEAR-CHANGE ROBOT
		
All AB Dynamics steering robots can be used for driverless testing. A wide range of steering robots are available for different applications (see SP6020).	The CBAR600 and the CBAR1000 can be upgraded with an auxiliary spring-loaded safety brake to apply the brake in the event of a drop signal in the driverless safety system (see SP6031).	For vehicles with a manual gearbox, AB Dynamics can offer a gear-change robot with the CBAR upgraded with a clutch robot for driverless testing (see SP6210 and SP6211).

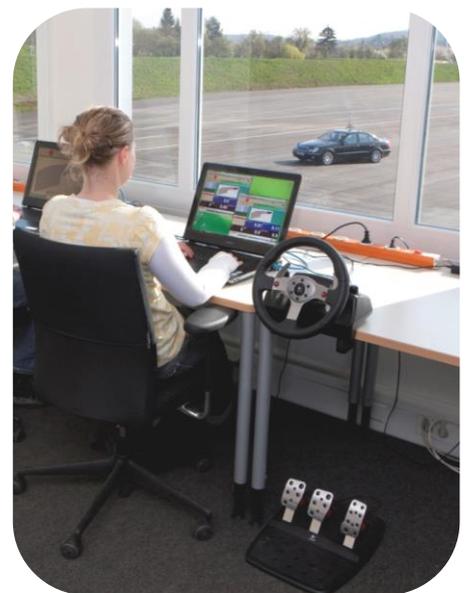
DTS BASE-STATION

The base-station is normally located within line-of-sight of the test track (although this may not be possible for durability testing). The base-station can be installed in a building or even in another vehicle. The base-station software displays real-time information about the vehicle's position, speed and heading. When multiple vehicles are being tested simultaneously, their relative positions and velocities are also available.

Tests can be configured and run from the base-station and the data uploaded immediately afterwards for analysis. Video and audio data channels can also be sent from the vehicle in real-time, allowing the users to check for vehicle problems.

Remote controls (a steering wheel and pedals, *right*) may be used to drive the vehicle from the base-station. An E-stop button allows the vehicle(s) to be stopped quickly in an emergency.

By taking the human driver out of the vehicle, AB Dynamics' driverless system enables the most dangerous and arduous vehicle tests to be performed accurately, repeatably and without risk of driver injury.



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5