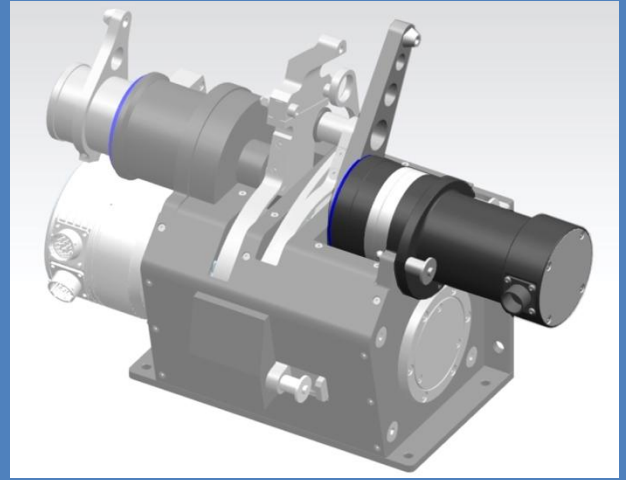


Choice of two actuators for clutch control – designed for use with ABD's other pedal robots

ABD can offer a choice of two solutions for the control of a vehicle's clutch pedal. Both offer precise servo-control allowing accurate and repeatable position inputs. The use of a clutch robot and gear-shift robot allow a manual-gearshift vehicle to be driven robotically, either with a driver onboard or in driverless mode.



Under-seat pedal actuators (throttle, brake and clutch)



Rotary clutch actuator fitted to CBAR

Steering and pedal robots from ABD can be used in a wide range of vehicles with both manual and automatic gearboxes. For many types of tests, it is not necessary to have robotic control of the vehicle's gearbox as this can still be done by a human driver (or by the car itself), with the robots controlling the steering and/or pedals.

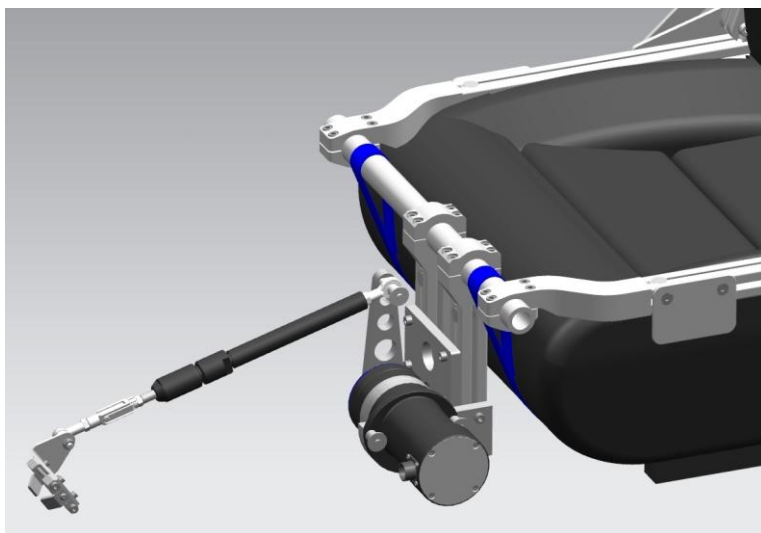
However, for the driverless control of a manual-gearshift vehicle it is necessary to incorporate actuators to control the clutch and gearbox. ABD has a gearshift robot, which is covered by Specification SP6211, and a range of clutch actuators, covered here.

Clutch robot – choice of actuators

Linear actuator		Rotary actuator	
DC motor driving a ball-screw actuator		DC motor driving via reduction gearbox	
Installed under the driver's seat (fits in DTS under-seat pedal actuator unit)		Mounts to Combined Brake and Accelerator Robot (CBAR)	
Can be used standalone via BR-style on-seat mounting frame		Can be used standalone via BR-style on-seat mounting frame	
Peak force:	800N	Peak force:	350N
Max. speed:	600mm/s	Max. speed:	650mm/s (at up to 200N)

Clutch robot in use

The clutch robot is operated using the same proven controller hardware as ABD's other robots and can be programmed via the same easy-to-use software interface. Users can program different "clutch" and "declutch" speed profiles to suit the test vehicle. Synchronized, repeatable gear changes and clutch movements can be automatically managed by the robot controller.



Rotary clutch actuator fitted to seat-frame for stand-alone use



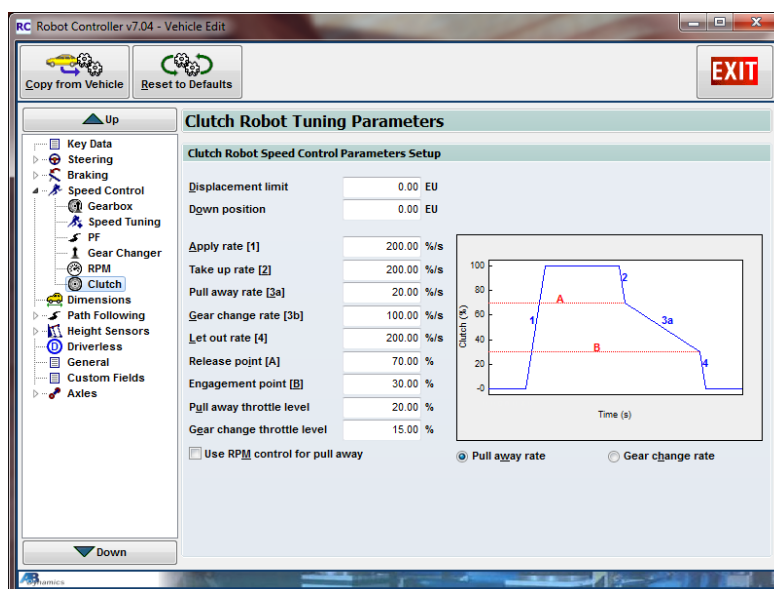
Rotary clutch actuator (close-up)

Software

Each vehicle can have a precisely defined pedal speed profile for “clutch” and “declutch” actions.

Different profiles for vehicle pull-away and gear-changes can be defined.

Clutch robot control is fully integrated in the vehicle speed-control functions of the robot system.



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*OICA World Motor Vehicle Production survey 2012