Steering Robots

AB Dynamics Steering Robot Range:
SR15, SR15 Orbit, SR35, SR60, SR60 Orbit, SR60 Torus, SR150

Introduction

AB Dynamics steering robots apply accurate, controlled inputs to a vehicle's steering system as required for a wide range of tests including for transient handling behaviour, ADAS testing, legislative tests (fishhook, sine-dwell etc.), steering system evaluation, durability and misuse testing. They enable a wide range of steering inputs to be applied with high precision and repeatability, to enable high quality data can be gathered quickly. All AB Dynamics steering robots can be used in a path-following or driverless system.

SR60 Steering Robot

SR60 Torus-S Steering Robot

A range of motors are available to suit all types of test applications. AB Dynamics robots can be used with an external data capture system and include built-in multi-channel data capture to minimise the total hardware required in the vehicle. AB Dynamics steering robots can work in conjunction with AB Dynamics pedal, gear changing and clutch robots.

Standard Features for Steering Robot Range

- Integral transducers for steering wheel angle and torque (some models)
- Typical installation time: 30 minutes
- Fully programmable and easy-to-use control software running under Windows 10/8/7/Vista/XP
- Standard test profiles to meet ISO 7401 and many other test types
- Some steering robots are suitable for tests specified by FMVSS126, NHTSA, EuroNCAP
- Vehicle can be driven normally when robot disabled
- Integrated electronics package powered from vehicle's 12 or 24V supply (or self-powered <1 hour).
- Data capture (robot channels, analogue input, motion pack data, CAN and more)
- CAN I/O (optional)
- Inputs and outputs for test and data capture triggering functions
- Upgradeability to control steering, braking and accelerator functions simultaneously
- The system can be upgraded to perform path-following tests (see ABD specification SP6008)

Hardware

Since the steering robot was launched in 1997, it has become an essential tool in many different types of vehicle testing. AB Dynamics offers a range of steering robots to suit a variety of test requirements. The table below shows the performance characteristics of the seven types of AB Dynamics steering robot motor:

	SR15	SR15 Orbit	SR35	SR60	SR60 Orbit	SR60 Torus	SR150
Direct drive motor			•	•		•	•
Hollow for use with airbag in place	•	•			•	•	
Suitable for sine-dwell/fishhook				•	•	•	
Suitable for path following	•	•	•	•	•	•	•
Max torque (short duration)	15Nm @ 900°/s	15Nm @ 900°/s	35Nm @ 1300°/s	60Nm @ 1650°/s	60Nm @ 1500°/s	60Nm @ 1850°/s	150Nm @ 550°/s
Rated torque	15Nm @ 900°/s	15Nm @ 900°/s	35Nm @ 1300°/s	60Nm @ 1650°/s	60Nm @ 1500°/s	60Nm @ 1850°/s	150Nm @ 550°/s
Max velocity	1000°/s @ <10Nm	1000°/s @ <10Nm	2500°/s @ <5Nm	2500°/s @ <15Nm	2500°/s @ <10Nm	2500°/s @ <20Nm	1500°/s @ <25Nm
Motor mass	5.6kg	5kg	9kg	12.5kg	8kg	10.5kg	19kg

Note that the holding times for rated and maximum torque levels are limited by motor's thermal capacity (refer to AB Dynamics for details).

The SR15, SR15 Orbit, SR60 Orbit and SR60 Torus models have a key feature; the hole in the middle. This allows these robots to be attached to the vehicle's steering wheel without removing or disabling the airbag.

This enhances test-driver safety and removes the need to make custom steering column adaptors. The main benefit, however, is seen in modern vehicles where the removal of the driver's airbag may be detected by the ESC system, triggering a change in the vehicle's dynamic limits. With AB Dynamics hollow steering robots, this problem is solved.

Software

The steering robot's user interface software runs on any standard PC running Windows. The software enables the driver to define and run new tests quickly and easily by choosing from a library of standard tests. These include sine, sine sweep, step and ramp inputs. A range of special tests is also provided, such as sine-dwell, roll stability (used for fish-hook, J-turns etc.), catch-up and flick. In addition, test profiles can be recorded from direct driver input using a learn mode or played out from data stored in an ASCII file. The robot can also follow an external input signal.

"The performance of our robots has exceeded all expectations and they continue to deliver accurate results year after year"

Brack Benge, Chrysler

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