

Soft Pedestrian Target™



The Soft Pedestrian Target (SPT) system is a portable belt propulsion mechanism which uses our patented Synchro™ technology to accurately and consistently play out NCAP and custom-made test scenarios.

The SPT system uses a standard AB Dynamics controller and steering robot motor to power the drive unit. It is programmed using Robot Controller Software, which is common to our portfolio of track testing solutions. Customers can use an existing steering robot as the drive motor or alternatively, versions with dedicated built-in motors are available and capable of speeds of up to 40 km/h. The SPT system can be powered by a 12V car battery and for higher performance, a mains power pack can be supplied (115v and 230v versions available).



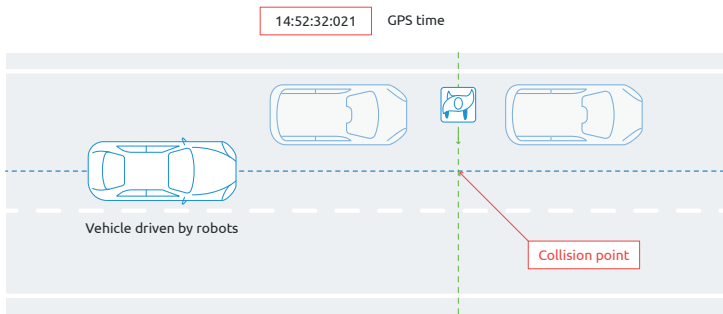
Specifications

	SPT 20	SPT 20 Standalone	SPT 40 Standalone
External SR required	Yes - SR 60, SR 60 Torus	No, built in	
Maximum rated speed	20 km/h with 15 kg payload	20 km/h with 15 kg payload	40km/h*
Maximum acceleration	0.8 g with 15 kg payload		
Position measurement	Uses motor encoder: Typical dynamic accuracy at platform better than 2 cm		
Installation	Steering robot can be converted between SPT and steering use	No extra installation required other than belt setup	
Sled height	25 mm		
System protection	In built belt tension measurement system checks belt and stops motor if belt tension changes significantly		
Water resistance	Can be used in rainy conditions; case acts as a rain cover for motor	Motor box sealed, suitable for wet and icy conditions	
Mains power pack required	Recommended for longer runs at maximum performance		Yes - for maximum performance*

*Optional mains power supply unit is recommended for high speed operation such as with a cyclist dummy

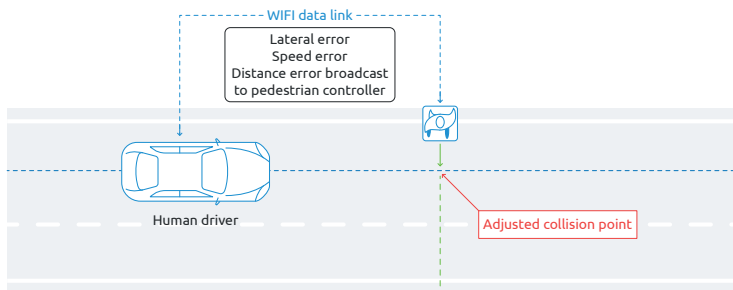
Control modes

The Soft Pedestrian Target can operate in three control modes, according to the test requirements and the other available hardware.



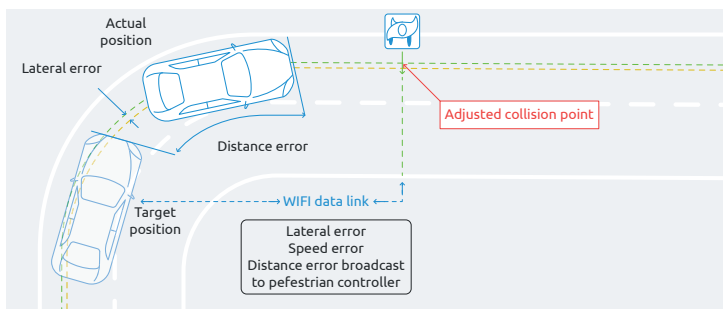
Mode 1: Coordinated with robots using GPS time synchronisation

Vehicle is driven using steering robot (with path-following) and pedal robots for accurate positioning and speed control. Vehicle and target motion is started using a GPS time trigger. Both trajectories and speed profiles are pre-defined to give the synchronisation between vehicle and target, according to test requirements.



Mode 2: Synchronised motion

Synchro sends GPS data from the vehicle to adjust the target speed and position in real-time. Thus, a human driver follows the approach path and the SPT controller adjusts to compensate for the vehicle's lateral and time error, ensuring the scenario takes place correctly.



Mode 3: Non-orthogonal synchronised motion

Synchro enables the subject vehicle to travel along a non-linear path and intercept the target at various impact angles. Synchronisation happens again to adjust the target to compensate for both vehicle's lateral and time error, making sure that the scenario takes place correctly.

About AB Dynamics

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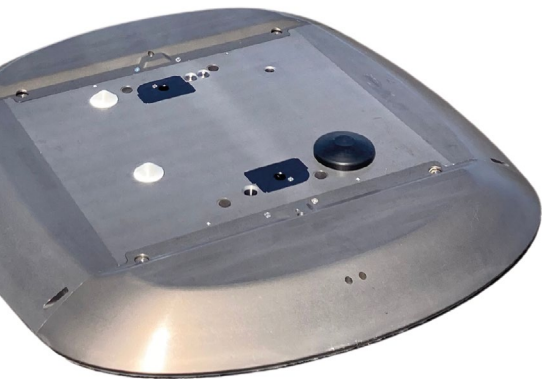
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The future of VRU testing today

LaunchPad™ 80

Gen 2



Developed for reliable and realistic ADAS testing, the LaunchPad 80 is the fastest LaunchPad specifically for VRU testing, capable of carrying a motorcycle target at 80km/h and braking at over 0.6g. The LaunchPad 80 is now in its second generation, allowing direct control and data capture from a remote laptop and is primed for future battery upgrades. The LaunchPad 80 Gen 2 is the most capable and flexible LaunchPad yet.



Euro NCAP approved ADAS test platform



80km/h top speed with target fitted



Battery capacity increased to 880Wh for extended running



44 tonne truck drive over capacity



4-wheel drive and 4-wheel steering for manoeuvrability



Aluminium chassis with IP67 weather resistance



Hydraulic braking enabling 6m/s² deceleration



Enhanced thermal resistance enables extended hot weather running



Compatible with TrackFi PowerMesh and TrackFi radio systems



High power drives ready for higher voltages, for future battery technologies and higher operating speeds



Compatible with OxTS and GeneSys miniature GNSS inertial navigation units



Remote RC allows direct control and data capture from a remote laptop

Specification

LaunchPad™ Spin

Dimensions

892 x 868 x 65mm

Weight (approx.)

45kg (excluding batteries)

Weather resistance

Fully sealed electronics,
waterproof to IP67

Maximum speed (with target)

30km/h

Maximum acceleration

3m/s²

(excluding target)

Maximum braking

5m/s²

(excluding target)

Payload

Pedestrian, cyclist, motorbike,
moped, animal. Maximum 15kg

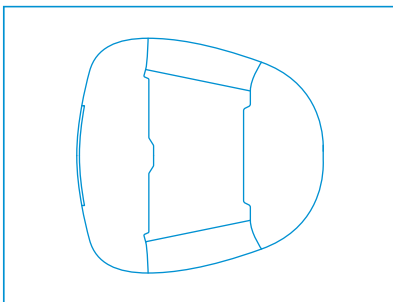
Batteries

High-capacity lithium-ion
battery packs 540Wh,
rapid battery swap system

Drive-over capacity

3550kg per wheel

Size comparison to scale



LaunchPad™ 60

Dimensions

917 x 875 x 65mm

Weight (approx.)

45kg (excluding batteries)

Weather resistance

Fully sealed electronics,
waterproof to IP67

Maximum speed (with target)

60km/h

Maximum acceleration

4m/s²

(excluding target)

Maximum braking

6m/s²

(excluding target)

Payload

Pedestrian, cyclist, motorbike,
moped, animal. Maximum 15kg

Batteries

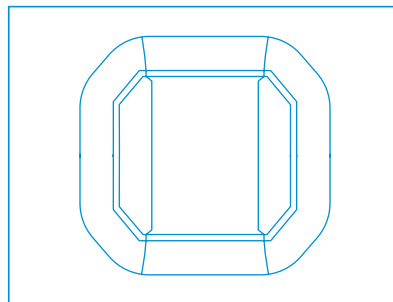
Twin high-capacity lithium-ion
battery packs 540Wh,
rapid battery swap system

Drive-over capacity

1000kg per wheel

3550kg per wheel (HD Panel)

Size comparison to scale



LaunchPad™ 80

Dimensions

1045 x 960 x 80mm

Weight (approx.)

75kg

Weather resistance

Fully sealed electronics,
waterproof to IP67

Maximum speed (with target)

80km/h

Maximum acceleration

3m/s²

(Euro NCAP PTW fitted)

Maximum braking

>6m/s²

(Euro NCAP PTW fitted)

Payload

Motorbike, moped
Maximum 15kg

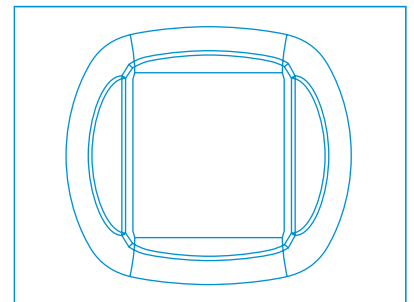
Batteries

Twin high-capacity LiFePO4
battery packs 880Wh,
rapid battery swap system

Drive-over capacity

3550kg per wheel

Size comparison to scale



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Guided Soft Target™ (GST™)



The GST is the next generation of surrogate vehicle system designed for use in the testing of vehicle Advanced Driver Assistance Systems (ADAS). Both our GST 100 and GST 120 Platforms benefit from many class-leading features including the ultra-low height of just 100mm. The GST 120, with its 4.8kWh battery is the only product on the market capable of testing highway assist and drive pilot systems at realistic highway speeds.

The GST is designed to enable high-speed collisions to be carried out without causing significant damage to the test vehicle. It consists of a GST Platform, which can be driven over, and a separate foam panel body (the Soft Car 360™ harmonised Global Vehicle Target, GVT). When the platform is driven over, the wheels of the vehicle retract into the chassis to protect the suspension of the GST and to provide the minimum possible shock input to the test vehicle suspension.



Features

- Aluminium chassis – wheels retract into chassis when driven over
- Electric drive system with belt drive transmission
- Electrically-actuated steering system
- Lithium iron phosphate battery pack giving outstanding power to weight ratio
- Battery packs are certified safe for air freight transportation under UN38.3
- 4-disc hydraulic braking system with failsafe emergency braking
- AB Dynamics' proven driverless control system, with hardware mounted in water-resistant casing
- Position feedback from inertial navigation system with GPS correction
- Accurate path-following and speed control capability
- Synchro software allows coordinated motion with other AB Dynamics platforms, manually driven vehicles and those equipped with AB Dynamics driving robots

Specifications

	GST 100	GST 120
Maximum acceleration (with Soft Car 360 fitted)	0.22g	0.28g
Maximum deceleration	0.8g	0.8g (with ABS)
Maximum lateral acceleration	0.4-0.5g	0.4-0.5g
GST Platform	315kg	345kg
GST Platform length	2950mm	3160mm
GST Platform width	1680mm	1680mm
GST Platform height (Suspension retracted into chassis)	100mm	100mm
GST Platform wheelbase	1400mm	1670mm
GST Platform front track	790mm	790mm
Max ground clearance, set to max ride height	20mm	20mm
Edge details (edge for minimal radar reflection)	22deg	22deg
Battery capacity	3.6kWh (removable for shipping)	4.8kWh (removable for shipping)
Path-following accuracy (1SD RMS typical maximum, compatible with OxTS and Genesys products)	2cm	2cm
Over-run capacity	Up to 1000kg per wheel+*	Up to 1000kg per wheel+*
Typical maximum speed (with Soft Car 360)	100km/h	120km/h

+(500kg with ultra-low-profile top plate)

* HD version available for use with heavy trucks

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Bringing new levels of realism and vehicle protection to VRU testing

Soft Pedestrian 360™



The Soft Pedestrian 360 from DRI is the next generation of articulated surrogate pedestrian target, bringing a whole new level of realism and vehicle protection to VRU testing.

Sophisticated active articulation including upper body joints enables naturalistic movement and the ability to synchronise gait with platform speed, so that acceleration and deceleration are more realistic than ever. Additionally, the Soft Pedestrian 360's robust design has been carefully considered for repeatable, uninterrupted testing.

Available in both adult and child variants, the Soft Pedestrian 360 has been developed by the same team from DRI that brought us the iconic Soft Car 360®. The Soft Pedestrian 360 is the result of years of real-world testing experience gained working with the world's leading OEMs and the NHTSA.



Fully programmable active articulation of hip, knee, shoulder and neck for realistic motion



Euro NCAP approved and complies with ISO 19206-5 draft requirements for pedestrian targets



Step-in-sync functionality ensures legs are synchronised in real-time with platform IMU



Sophisticated active articulation ensures natural gait



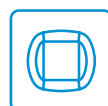
No exposed plastic or metal components that can damage vehicle panels and windscreens



Durable servo design with foam protection and clutch mechanism to prevent from being back driven



Modular design for easy reassembly



Compatible with common VRU platforms

Specifications

Dimensions

	Adult	Child
Height	1800 mm	1154 mm
Shoulder width	500 mm	308 mm
Weight	6 kg (fully articulated)	2.6 kg

Performance

	Adult	Child
Maximum collision speed	80 km/h	60 km/h

Supported sensor testing

	Adult	Child
Ultrasonic	Yes	Yes
Mono/stereo camera	Yes	Yes
Lidar	Yes	Yes
Radar	Yes	Yes
Near infrared	Yes	Yes

Articulation options

	Adult	Child
Full	Hip, knee, shoulder, neck	-
Standard	Hip, knee, shoulder	-
Basic	Hip, knee	Hip, knee

Compliance

	Adult	Child
Euro NCAP TB 029	Yes	In progress
ISO 19206-2	Yes	Yes



Designed for test engineers by test engineers

The Soft Pedestrian 360 is designed and engineered by Dynamic Research, Inc (DRI) in California. For decades DRI has provided research and testing services for the world's leading OEMs, completing hundreds of tests per year, including FMVSS, NHTSA NCAP and Euro NCAP tests.

DRI has leveraged its extensive hands-on experience with test targets and equipment in nearly every possible scenario to design, develop, and produce a range of best-in-class surrogate targets such as the Soft Car 360.



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Bringing new levels of realism and durability to VRU testing

Soft Motorcycle 360™



The Soft Motorcycle 360 from DRI is a durable and realistic surrogate motorcycle target that is stable at speeds of up to 80km/h. Its rotating wheels and realistic shape mean that it is reliably recognised by vehicle sensor systems including cameras, radar and lidar.

Durability is key to the Soft Motorcycle 360's design, with its lightweight foam construction minimising the potential for vehicle and target damage. Plus its modularity means that when parts are damaged they can quickly and easily be replaced.

Developed by the same team from DRI that brought us the iconic Soft Car 360®, the Soft Motorcycle 360 is the result of years of real-world testing experience gained working with the world's leading OEMs and the National Highway Traffic Safety Administration (NHTSA).



Recognised as a real motorcycle by sensing technologies including camera, radar and lidar



Rotating wheels provide speed-matched Doppler effect for radar sensors



Soft structure and light weight minimises damage to target and test vehicle



Modular design for easy reassembly



Euro NCAP approved and complies with ISO 19206-5 draft requirements



Stability proven at 80 km/h paired with LaunchPad™



Abrasion resistant materials and field-repairable finish ensure target longevity



Moulded foam construction enables realistic shape for improved visual recognition

Specifications

Dimensions

Wheelbase	1460mm
Wheel diameter	635mm
Overall height	1670mm
Width	610mm

Performance

Maximum operation speed	80km/h
Water resistance	Yes

Supported sensor testing

Ultrasonic	Yes
Mono/stereo camera	Yes
Lidar	Yes
Radar	Yes

Compliance

Euro NCAP 2023 protocol	Yes
ISO 19206-5 WD	Yes



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PS-SM36-02/24-ROW



Euro NCAP Global Vehicle Target

Soft Car 360®



The Soft Car 360 from DRI is a lightweight, durable, and collapsible whole vehicle target which forms the perfect ADAS testing solution when combined with AB Dynamics' GST platform. Suitable for use with passenger cars and heavy-duty vehicles alike, the Soft Car 360 separates into lightweight parts on impact to minimise the risk of damage to test vehicles.

The Soft Car 360 is the result of years of real-world testing experience gained working with the world's leading OEMs and NHTSA. Available in hatchback, sedan and micro versions, the hatchback has been adopted as the Global Vehicle Target (GVT) for Euro NCAP ADAS testing.



Euro NCAP approved hatchback



Less than 8 minutes build time



Foam body structure underneath photo-realistic vinyl skins



Radar reflective material in bumpers, doors and bonnet



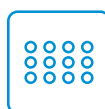
Aerodynamically stable for testing at up to 120 km/h with GST 120



Radar absorbing material underskirts



Ability to perform ADAS tests at a closing speed of 144 km/h



Panels encase breakaway radio and GNSS antennas



Full wheel foam pieces with corner reflectors



Hatchback, sedan and micro versions also available

Specification

Dimensions	Hatchback	Sedan	Micro
Length	4023mm	4928mm	2794mm
Width	1712mm	1854mm	1524mm
Height	1427mm	1473mm	1473mm
Weight	108kg	118kg	79kg
Performance	Hatchback	Sedan	Micro
Maximum speed at which target is stable	120 km/h	80 km/h	80 km/h
Supported sensor testing	Hatchback	Sedan	Micro
Ultrasonic	Yes	Yes	Yes
Mono/stereo camera	Yes	Yes	Yes
Lidar	Yes	Yes	Yes
Radar	Yes	Yes	Yes
Compliance	Hatchback	Sedan	Micro
Euro NCAP	Yes	No	No
ISO 19206-3:2021	Yes	No	No



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Pedal Robots

Precise and repeatable control of brake, throttle and clutch inputs



Combined Brake and Accelerator Robot (CBAR)

Combined Brake and Accelerator Robots (CBAR)

Combined Brake and Accelerator Robots are single actuator units with two output levers to control a vehicle's brake and throttle. The CBAR 600 is designed to provide vehicle speed control and has a lower peak brake force than the RBR 1500 but can also be used for accurate brake force inputs up to 600N. The CBAR 600 is available in a low configuration (CBAR 600L) which offer the same brake performance with a smaller space claim. The CBAR 1000 is slightly larger in size but offers an increase in performance over the CBAR 600. Compared to separate brake and throttle actuators, the CBAR is more compact, lighter and quicker to install.

Rotary Brake Robots (RBR)

Rotary Brake Robots use compact rotary actuators which provide a very high apply rate. The RBR 1500 offers the highest performance of any AB Dynamics brake robot and is designed to give the combination of high force and rapid apply rate needed for Brake Assist System testing. The RBR 600 uses the same actuator as a CBAR 600 for moderate brake force testing.



Rotary Brake Robot (RBR)

Clutch Robot (CR)

The Clutch Robot is available with the CBAR 600 or the CBAR 1000. It is used in conjunction with the Gearshift Robot to enable driverless testing in cars with manual gearboxes. Clutch engage/declutch profiles can be defined to suit the test vehicle.



Clutch Robot (CR)

Accelerator Robot (AR)

The Accelerator Robot (AR 1) uses a compact rotary actuator to control throttle pedal position. It gives accurate speed control for constant speed/acceleration, and can also be used for control of throttle pedal position.



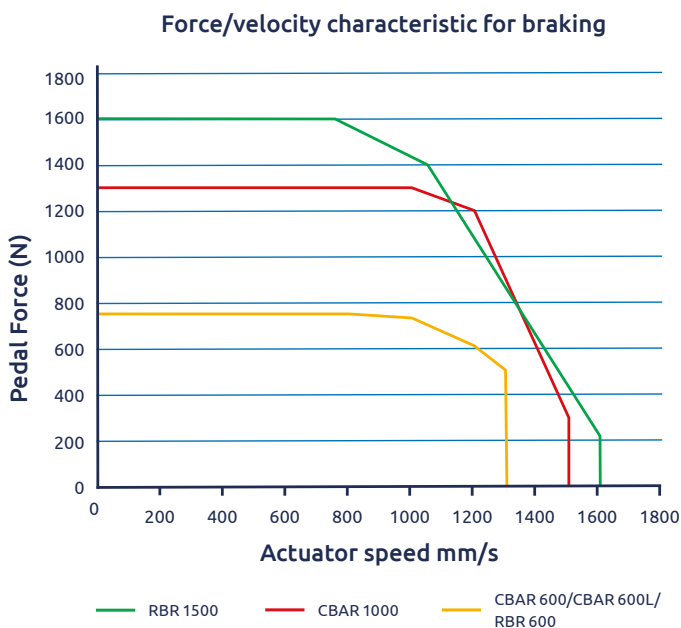
Accelerator Robot (AR)

CBAR and RBR comparison

CBAR 600	Controls both the brake and accelerator pedal, with enough power to replicate typical driving pedal inputs. Perfect for AEB and other ADAS testing. The CBAR 600 can be upgraded for driverless testing.
CBAR 600L	Offers the same brake performance as the CBAR 600 in a more compact package. Not suitable for the driverless upgrade.
CBAR 1000	As CBAR 600 but with >1000N force capability and increased speed capability. The CBAR 1000 can be upgraded for driverless testing.
RBR 600	Compact brake robot which gives high speed (over 1000mm/s) but lower peak force than the RBR 1500.
RBR 1500	For customers needing the ultimate in aggressive brake testing. High-power rotary actuator gives the highest braking force and speed. Well-suited for brake fade testing.

Performance characteristics

Pedal Robots force/speed curves



Accelerator Robot comparison

	Accelerator Robots	CBAR 600 CBAR 1000	CBAR 600L
Maximum force	150N	-	-
Maximum speed	300mm/s	-	-
Maximum pedal stroke	130mm	-	-
Maximum throttle force	-	200N	175N
Maximum throttle speed	-	650mm/s	715mm/s
Maximum throttle stroke	-	125mm	125mm

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Highly repeatable, perfectly accurate
Steering robots



AB Dynamics has the widest range of steering robots in the world; whatever your requirements, we can offer you the best solution.

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

Standard features

- Integrated transducers for steering wheel angle and torque (some models)
- Typical installation time of 30 minutes
- Compatible with RC software for fully programmable and easy to use control
- Standard test profiles to meet a range of open-loop ISO and regulatory tests
- Suitable for NHTSA, NCAP and other safety testing
- Some robots suitable for sine-dwell/fishhook testing
- Vehicle can be driven normally when robot disabled
- Integrated electronics package powered from vehicle's 12 or 24V supply
- 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
- Upgrades available for simultaneous control of steering, braking and accelerator functions

The steering robot range

Since our first steering robot was launched in 1997, it has become an essential tool in many different types of vehicle testing. We now offer a range of steering robots to suit a variety of test requirements.

	SR 15	SR 15 Orbit™	SR 35	SR 60	SR 60 Orbit™	SR 60 Torus™	Halo™	SR 150
Direct drive motor			•	•		•	•	•
Hollow centre	•	•			•	•	•	
Suitable for sine-dwell/fishhook				•	•	•	•	
Adaptable for truck use	•		•	•		•	•	•
Suitable for durability/misuse testing	•		•	•		•	•	•
Adaptable for SPT plug-in			•	•		•	•	
Max torque (short duration)*	20Nm @ 200°/s	20Nm @ 200°/s	43Nm @ 850°/s	70Nm @ 580°/s	70Nm @ 580°/s	85Nm @ 500°/s	90Nm @ 500°/s	160Nm @ 500°/s
Rated torque	15Nm @ 500°/s	15Nm @ 500°/s	35Nm @ 1300°/s	60Nm @ 1300°/s	60Nm @ 1300°/s	60Nm @ 1500°/s	75Nm @ 1500°/s	150Nm @ 550°/s
Max velocity	1000°/s @ <10Nm	1000°/s @ <10Nm	2500°/s @ <5Nm	2500°/s @ <15Nm	2000°/s @ <10Nm	2500°/s @ <10Nm	2500°/s @ <10Nm	1500°/s @ <25Nm
Motor mass	5.6kg	5kg	9kg	12.5kg	8kg	10.5kg	9kg	19kg
Motor bearing friction	<1.5Nm	<4.0Nm	<0.5Nm	<0.5Nm	<4.0Nm	<1.0Nm	<1.0Nm	<1.0Nm
Motor plus steering wheel** inertia	0.0640 kgm ²	0.0520 kgm ²	0.0288 kgm ²	0.0387 kgm ²	0.1500 kgm ²	0.1265 kgm ²	0.1156 kgm ²	0.1000 kgm ²
System angle accuracy	Typically better than ±0.2, depending on reaction torque and proper installation of the torque reaction system.							

*Holding times for rated and maximum torque levels are limited by motor thermal capacity (contact us for details).

**Steering wheels are used on the SR 35/60/150/Torus/Halo models

Software

The steering robot's user interface software, compatible with standard Windows PCs, allows drivers to define and execute tests easily. These tests include standard options like sine, sine sweep, step, and ramp inputs, as well as specialised tests such as sine-dwell, roll stability, catch-up, and flick. Additionally, the robot can record test profiles from direct driver input or play them back from an ASCII file, and it can respond to external input signals.



About AB Dynamics

AB Dynamics is a leading global provider of automotive test and verification solutions that facilitate the development of vehicles that are safer, more efficient and sustainable. As part of the AB Dynamics Group of companies we enable customers to develop and test in virtual environments, validate on the track and then evaluate vehicles on public roads.

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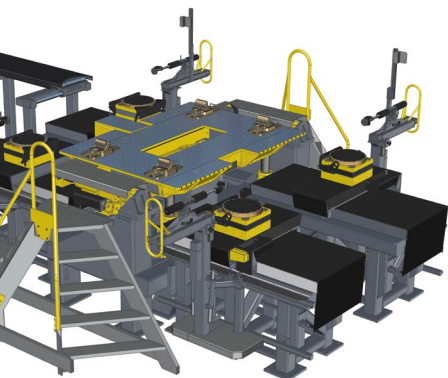
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Class-leading kinematics and compliance test machine

SPMM™ Plus



The SPMM Plus is the latest generation of the SPMM (Suspension Parameter Measurement Machine) that for decades has been a fundamental tool used by engineers throughout the vehicle development cycle. Now, the SPMM Plus provides automotive innovators with the tools to develop the next generation of mobility solutions.

The SPMM Plus enables you to:

- / Faithfully simulate on-road vehicle behaviour. Its unique moving body design replicates a vehicle's interactions with the road surface with unrivalled precision
- / Support virtual validation via our hybrid simulation data pipe that allows real-time communications with external simulation environments
- / Test a range of vehicles from the smallest city cars up to light commercial vehicles.



Hybrid simulation data pipe for HiL test capability



Unique moving body, fixed ground plane design



Exceptionally accurate Dynamic Arm wheel position measurement system



Fully programmable and easy-to-use control software running within Windows



One-click data export to popular modelling packages such as CarMaker and CarSim



Low maintenance, servo-electric design



Optional CoG and MoI test capability, including measurement of standalone objects



Proven pedigree with installations globally



Efficient software and rig design yields significant testing uptime and test vehicle throughput



Sustainable design with long lifespan, upgradeability and use of recyclable materials



Fully customisable MATLAB data processing and reporting suite



Extensive catalogue of options and accessories

Specifications

Capacity

	Minimum	Maximum
Vehicle wheelbase range	1960 mm	4540 mm*
Vehicle track range	1100 mm	2082 mm
Vehicle mass	-	5000 kg**
Rear wheelpan	400 mm	600 mm***

*With intermediate or secondary table extenders fitted

**6800 kg if centrally loaded

***With large wheelpan adaptor fitted

Dynamic Arm wheel position measurement

Accuracy

	Sub range*	Accuracy (0-5Hz)	Resolution
Fore/aft (X) & Lateral (Y)	±10 mm	±0.02 mm	0.005 mm
Vertical (Z)	±10 mm	±0.02 mm	0.005 mm
Steer	±1 °	±0.004 °	±0.001 °
Camber	±1 °	±0.005 °	±0.001 °
Wheel spin	±30 °	±0.01 °	±0.003 °

*Contact AB Dynamics for full range accuracy

Cross-talk

	Maximum cross-talk
Linear to linear	0.003 mm/mm
Linear to rotation	0.0004 mm/°
Rotation to linear	0.015 °/mm
Rotation to rotation	0.003 °/°

Body motions

	Range	Accuracy	Max velocity*
Bounce	±230 mm	±0.15 mm	140 mm/s**
Roll	±10 °	±0.02 °	7 °/s
Pitch	±8 °	±0.02 °	6 °/s

*Maximum velocity available with dynamic option

**Upgradable to 280 mm/s

Tyre contact patch motions

	Range	Accuracy	Max velocity*
Fore & aft (X)	±150 mm	±0.15 mm	100 mm/s*
Lateral (Y)	±150 mm	±0.15 mm	100 mm/s*
Powered rotational (δ)	±80 ° nominal	±0.02 °	30 °/s*

*Maximum velocity available with dynamic option

Wheel force measurement

	Calibrated range	Accuracy
Fore/aft (F_x) or lateral (F_y)	±1750 N	±5 N
	±15000 N	±30 N
Vertical (F_z)	0->5000 N	±5 N
	0->30000 N	±30 N
Steer moment (M_z)	±500 Nm	±1 Nm
	±750 Nm	±2 Nm

Cross-talk

	Maximum cross-talk
Load to load	< ±0.1 %
F_x or F_y to M_z	< ±0.0004 Nm/N
F_z to M_z	< ±0.0001 Nm/N



Dynamic Arm Measurement System



Servo-electric linear actuators



EtherCAT control system

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