

# Drive Solutions

Innovative  
Drive Safety Technology







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## Drive safety technology in a new dimension

In the Mechatronics division, Dorninger Hytronics manufactures innovative and unique products for driver trainings. With our expert know-how, we contribute to safety in road traffic and significantly increase the attractiveness of steering trainings.

World-wide, automobile clubs, vehicle manufacturers and private companies such as driving schools trust in our competence. Please see a reference list on our website [www.hytronics.at](http://www.hytronics.at).

If you are interested in our product portfolio, we kindly invite you to come to a drive safety centre or our headquarters for a product demonstration.

## Partnerships on the highest level

As a source of inspiration and ideas, we work together with Test & Training International. The company of Franz and Alexander Wurz has decades of experience in racing and in the planning and operation of successful drive safety centres.

Irrigation technology and water hazards from Evertz Hydrotechnik can be seamlessly integrated into the product portfolio and the Dorninger Hytronics controls for driving technology. With these partnerships, we bundle the core competencies into a professional and holistic overall solution. In the field of driving technology, Dorninger Hytronics stands for proven quality products that consider all requirements of center operators.





## Safety trainings on the Hydraulic Plate CARSP21

The fateful situation of a car skidding on roads wet with rain, icy or oil-stained roads is simulated and trained with the CARSP21 without any danger.

Depending on the speed at which the vehicle drives over the plate, the skidding process is more or less intensive. The manual control of the skidding intensity enables an optimum training tailored to the respective driver.

With the extreme setting, even pros can gather valuable experience on how to keep the vehicle under control, with or without drive stability program, simply with fast reactions and skills.

## Technological masterpiece - CARSP21

The CAR SP21 of Dorninger Hytronics combines fully developed technology and field-proven quality components from renowned product partners.

Our all-round service package comprises the annual expert check on site and professional customer service.

- innovative, computer-controlled complete system with hydraulically moved plate
- easy, user-friendly operation
- integrated safety logic for driving errors
- reliable all seasons operation with heating in the foundation pit and flood sensors
- fast service support via remote maintenance module





## The ultimate “truck driver experience” - Kick Plate TRUCK SP

Focus and the driver’s right feel are necessary for driving manoeuvres performed on the TRUCK SP. During the skidding process, the extremely loadable plate is moved to the side so that the vehicle swerves and starts skidding.

A unique feature of the TRUCK SP is the integrated axle counter. In this way, the skidding process for multi-axle vehicles can be directed exactly to the axle selected beforehand so that different dangerous situations with road trains can be practiced.

## Power pack TRUCK SP

The TRUCK SP of Dorninger Hytronics is the international high-end product in the field of drive safety trainings.

As a result of reliable technology, robust quality components and a professional service package, the TRUCK SP is the product of choice of renowned drive safety centres.

- extremely robust design
- suitable for passenger vehicle and truck trainings
- integrated axle counter enables selective skidding on a predefined axle
  - easy, user-friendly operation
  - reliable all seasons operation with heating in the foundation pit and flood sensors
  - fast service support via remote maintenance module



# Technology Kick Plate CARSP21

## General technical data CARSP21

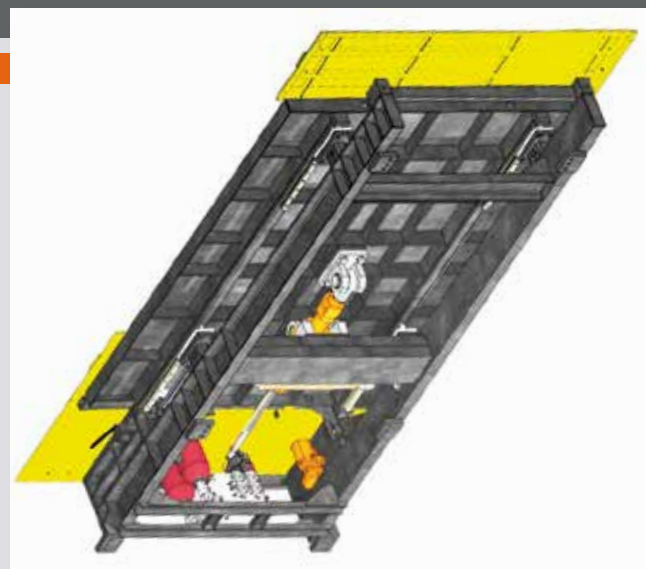
- max. vertical load (admissible axle load of the vehicle) ..... 4.0 t
- max. admissible total vehicle weight for driving on the plate ..... 7.5 t
- admissible speed range ..... 25 - 80 km/h
- min./max. wheel base of the vehicle ..... 1.5 – 4.5 m
- passage width ..... 3.8 m
- plate depth of the mobile plate ..... 3.0 m
- max. traverse speed of the mobile plate standard mode ..... 3.0 m/s
- max. traverse speed of the mobile plate boost mode ..... 3.2 m/s
- max. achievable acceleration of the mobile plate ..... 15 m/s<sup>2</sup>
- max. lateral movement of the vehicle standard mode ..... 35 cm
- max. lateral movement of the vehicle boost mode ..... 40 cm
- max. possible number of kick cycles ..... 240/h or 4/min
- max. possible number of kick cycles ..... 180/h or 3/min

## Energy and performance

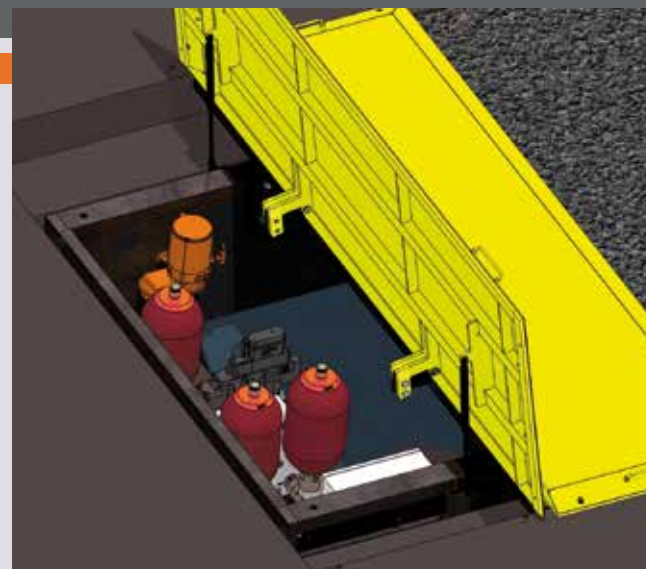
- standard electrical connection (other mains voltages on request) ..... 3 x 400 VAC / 50 - 60 Hz
- necessary series fuse incl. fault-current breaker ..... 35 A
- drive power electric motor hydraulic pump ..... 5.5 kW - 1450 rpm
- high-pressure hydraulic pump delivery rate standard mode ..... 11 l/min - 235 bar
- high-pressure hydraulic pump delivery rate boost mode ..... 11 l/min - 255 bar
- low-pressure hydraulic pump delivery rate ..... 11 l/min - 40 bar
- total hydraulic oil volume ..... ~ 180 l
- energy requirements (without heating) for 1000 kick cycles ..... 25 kWh

## Dimensions and weight

- dimensions of Kick Plate l x w x d ..... 6.0 x 3.0 x 0.8 m
- weight of Kick Plate (incl. hydraulic plate, mounting, cover, transport rack, without transport box) ..... 5700 kg
- dimensions hydraulic drive unit l x w x h ..... 1.30 x 1.20 x 1.80 m
- weight of hydraulic drive unit (incl. electrical cabinet, without oil filling) ..... 415 kg



3D-model Kick Plate CAR SP  
Bottom view



3D-model Kick Plate CAR SP  
Hydraulic control block with hinged service hatch

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# Technology Kick Plate TRUCK SP

## General technical data TRUCK SP

- max. vertical load (admissible axle load of the vehicle) ..... 8.0 t
- admissible speed range passenger car ..... 25 - 65 km/h
- admissible speed range truck ..... 20 - 45 km/h
- min./max. wheel base passenger car ..... 1.5 – 4.1 m
- min./max. wheel base truck ..... no limit
- passage width ..... 4.2 m
- plate depth of the mobile plate ..... 3.5 m
- max. traverse speed of the mobile plate ..... 3.2 m/s
- max. achievable acceleration of the mobile plate ..... 15 m/s<sup>2</sup>
- max. lateral movement of the vehicle ..... 40 cm
- max. possible number of kick cycles for trucks ..... 120/h or 2/min
- max. possible number of kick cycles for passenger cars ..... 180/h or 3/min

## Energy and performance

- electrical connection ..... 400 VAC / 50 - 60 Hz
- necessary series fuse incl. fault-current circuit breaker ..... 63 A
- drive power electric motor hydraulic pump ..... 15 kW - 1450 rpm
- high-pressure hydraulic pump delivery rate ..... 21 l/min - 250 bar
- low-pressure hydraulic pump delivery rate ..... 21 l/min - 40 bar
- total hydraulic oil volume ..... ~ 230 l
- energy requirement (without heating) for 1000 kick cycles ..... 110 kWh

## Dimensions and weight

- dimensions of Kick Plate l x w x d ..... 7.50 x 3.48 x 0.80 m
- weight of Kick Plate ..... 9800 kg
- dimensions of hydraulic drive unit l x w x h ..... 1.44 x 1.19 x 1.60 m
- weight of hydraulic drive unit (without oil filling) ..... 450 kg



Hydraulic power unit  
Drive unit of every Kick Plate



Hydraulic control block  
The core component of every Kick Plate

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## Patented development! Mechanical Obstacle MH

The sudden appearing of an obstacle in front of you cannot be simulated in a more realistic way! The ingenious invention demonstrates clearly to the driver how difficult it is to brake in front of a solid obstacle or to swerve out of the way. If the swerving or braking manoeuvre fails, the flags swing back into the ground in time. The drivers still experience a real dangerous situation

Typical dangers in road traffic, such as children running at the street from between parked cars or drivers ignoring priority in traffic, can also be trained with motorbikes for the first time world-wide.

## New standard for swerve training

Designing a new test track or modernising one - the Mechanical Obstacle MH is ideally suited for both purposes.

It can be integrated in existing tracks without any additional infrastructural measures and is distinguished by extremely low operating costs. Only a power connection is needed for operation.

- braking and swerving trainings with motorbike, passenger car and truck
- wide variety of training options with two or more obstacles, virtual crash simulation by radio
- easy use and control for trainers via control panel or tablet
- reliable operation in winter
- unbeatable energy efficiency: up to 98 percent energy saved compared to conventional water obstacles



# Central control unit - Drive Cube DC



## The MH control with a top design

The Drive Cube DC, the flexible control unit for the Mechanical Obstacle ist a perfect synthesis of form and function. For maximum flexibility and optimum comfort, the electric control panel and the sound-insulated compressor box can be set up in different places.

The robust and weather-resistant Drive Cube can simply be put on a concrete foundation. So additional building investments are not necessary.

## General technical data Drive Cube DC

- dimensions of Drive Cube l x w x h ..... 1.54 x 0.78 x 1.19 m
- dimensions of compressor box l x w x h ..... 1.08 x 0.78 x 1.19 m
- dimensions of control panel l x w x h ..... 0.46 x 0.71 x 1.19 m
- total weight (compressor box / control panel) ..... 235 kg (180 / 55 kg)

## Technology for pump drives and watering control

The electronic control system for water obstacles, sprinklers or flooding can be integrated in the Drive Cube on request. Furthermore our delivery range comprises the electrical power unit for pump drives. Contact us – we will offer you a custom-made central control according to your individual requirements.



## Course with dangerous obstacles

Two or more obstacles are staggered diagonally, one behind the other. During swerve training, drivers learn how to best respond to several dangerous situations.

The most difficult test conditions are achieved by placing the obstacle course behind a Kick Plate.

# Technology Mechanical Obstacle MH

## General technical data MH

- admissible approximation speed ..... up to 130 km/h
- swing-out and lowering time ..... 0.3 s
- drive unit swing-out movement ..... electro-pneumatic
- possible number of swing-out movements ..... 360/h or 6/min

## Energy and performance

- electric connection for compressor and control ..... 240 VAC / 50 - 60 Hz
- necessary series fuse incl. fault-current circuit breaker (30 mA) ..... 16 A
- pneumatic pressure ..... 5.5 bar
- energy requirement (without heating) for 1000 swing-out movements ..... 0.25 kWh

## Dimensions and weight

- dimensions of steel foundation trough l x w x d ..... 3.74 x 0.35 x 0.36 m
- weight of steel foundation trough ..... 305 kg
- weight of exchangeable element Mechanical Obstacle ..... 75 kg
- weight of flag ..... 0.45 kg
- simulated obstacle width ..... 2 m
- simulated obstacle height ..... 0.9 m



## Obstacle course

With several obstacles across the road, a wide variety of dangerous situations on multi-lane roads, such as a traffic jam after a curve, can be simulated.

By means of an early veering off of an obstacle, for example, the controlled switching to a suddenly accessible lane is trained. In addition to the random mode, the flexible control enables any conceivable combination of obstacles with different levels of difficulty.





## Popstacle - safe road holding at the limits

Low obstacles are especially dangerous in street traffic. Small animals or objects lying on the road are difficult to see and immediately demand the full attention of the driver.

The Popstacle suddenly rises up in front of the vehicle and imitates the path of an animal running across the road, in a wavelike manner. Changing lanes or braking - good concentration, correct assessment of the situation and quick reactions are important here. Especially drivers of large vehicles are extremely challenged by this ground-level obstacle.

The small amount of space required and the simple retrofitting make the Popstacle very interesting, also for driving school practice areas.

## Technical data

- available obstacle heights.....	500 mm	800 mm
- weight base trough .....	33 kg	45 kg
- weight Popstacle insert .....	30 kg	34 kg
- dimensions base		
length: 500 mm x width: 500 mm x depth: .....	900 mm	1150 mm
- duration upwards or downwards movement.....	0.25 s	0.40 s
- energy requirement (without heating) for 1000 movements.....	0.25 kWh	0.40 kWh
- diameter Popstacle .....	90 mm	
- admissible approximation speed .....	bis zu 130 km/h	
- pneumatic pressure .....	5.5 bar	
- electric connection for compressor and control.....	240 VAC /50 - 60 Hz	
- necessary series fuse incl. fault-current circuit breaker .....	16 A	





## Road irrigation - indispensable key to training success

High speeds and rain can lead to dangerous aquaplaning - the way in which to safely survive this emergency situation on water is learned on irrigated roads with slideway coatings. Gushing flutes, nozzles and sprinklers form the dangerous film of water on the road, which in reality often rapidly and unexpectedly leads to serious accidents.

A partial or complete irrigation of the training surfaces is possible. The intelligent pump system ensures energy-saving and optimised use of water. In the closed water circuit, the retention of rain water minimises the use of fresh water.

## Water obstacles - tried and tested training concept

A classic amongst driving dynamics trainings are obstacle-avoidance exercises with suddenly-appearing walls of water. The way to react quickly and capably in the event of an emergency is conveyed in a practice-oriented way during practice drives.

Water obstacles that are two to twelve meters long are embedded in the road and closed off with cover plates. The inclination-adjustable nozzle bar is set according to the inclination of the training track, so that the water walls are generated are always perpendicular. The nozzles can be controlled individually; therefore any moving figures required, such as a moving sine wave, can be shown.





## Drive Vision DV – this is pure motivation on the test track

The Drive Vision is the ideal addition to the Mechanical Obstacle MH. The LED display, which is clearly visible from a distance of up to 200 metres, indicates the speed exactly at the time when the driver enters in the driver training track and the speed at the simulated impact.

The luminosity of the display automatically adjusts to different lighting conditions and so is ideally visible at any time and even at a large viewing angle.

There are exciting areas of application without MH as well. A speed and lap time measurement down to milliseconds is possible for competitions.

## Technical details

- letter size .....	300 mm
- LED display .....	3 digits
- luminosity .....	3100 cd/m <sup>2</sup>
- luminosity control .....	automatic
- reading angle .....	+/- 60 degrees
- speed/time measurement is started via .....	induction loops
- control .....	CAN-bus
- supply voltage .....	240 VAC / 50 - 60 Hz
- design variants .....	one-line/two-line
- dimensions of one-line design version l x h x d .....	920 x 488 x 87 mm
- casing (industrial execution) .....	alu-profile-housing



For your safety on the road

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