

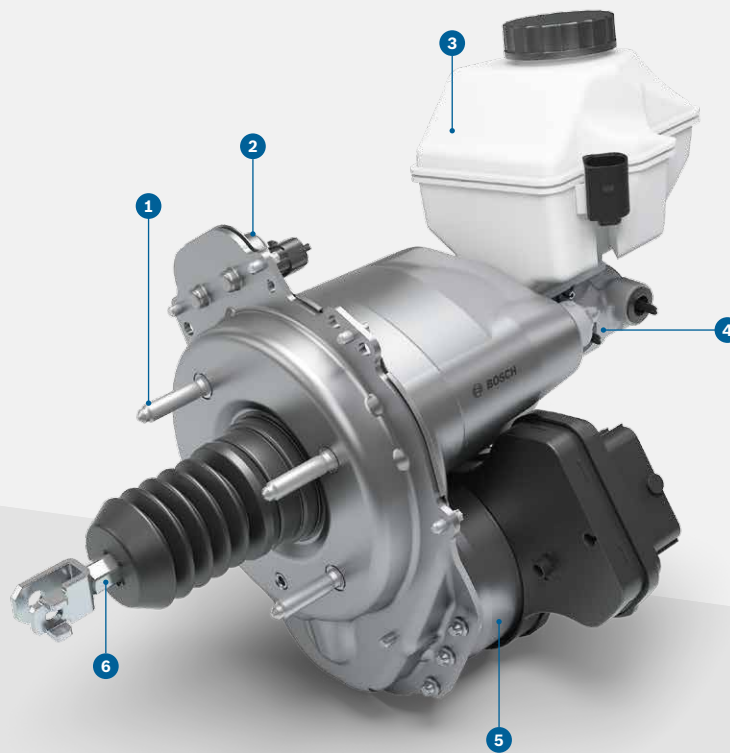
# Vacuum-independent brake booster

iBooster, generation 2



**BOSCH**

Invented for life



## PRODUCT BENEFITS

- ▶ Solution for vehicles with demanding requirements on pressure build-up dynamics and pressure control accuracy
- ▶ Pedal characteristics adjustable by software parameter
- ▶ Brake torque blending performance up to 0.3g in combination with ESP® hev
- ▶ Flexible installation: various positioning of the power pack to fulfill the packaging requirements
- ▶ Reduced installation costs through omission of vacuum pump and pipes
- ▶ Offering brake system redundancy that is required for automated driving

- 1 Vehicle interface
- 2 Differential travel sensor
- 3 Reservoir
- 4 Tandem master cylinder
- 5 Power pack (motor and electronic control unit)
- 6 Input rod



# highly dynamic

A fast pressure build-up enables short stopping distances for automated emergency braking and covers future NCAP requirements.

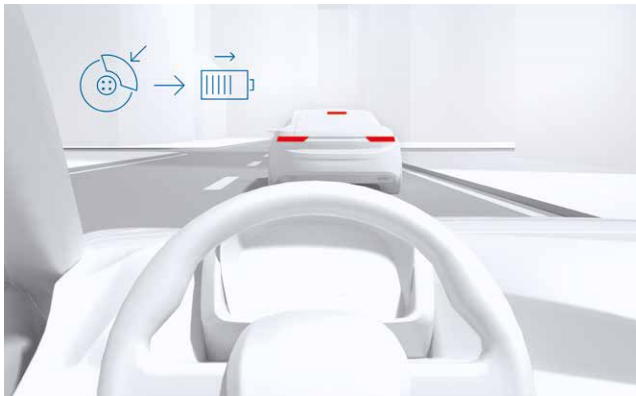
## TASK

The iBooster is a vacuum-independent, electromechanical brake booster that meets the demands of a modern braking system. The iBooster can be used with all powertrain configurations including hybrid and electric vehicles. Modern combustion engines and electric vehicles do not provide a sufficient vacuum level for the vacuum brake booster; therefore, mechanical or electric vacuum pumps are still used in many vehicles. Energy is required to generate the vacuum in traditional braking systems. Instead of this, the iBooster uses electrical energy only during brake applies. That saves fuel and reduces CO<sub>2</sub> emissions.

## FUNCTION

The iBooster detects the driver's brake demand by an integrated pedal travel sensor and this information is sent to the control unit. The control unit steers the electric motor, while a gear unit converts the motor torque into the necessary boost force. The force supplied by the booster and the driver is converted into hydraulic pressure in a standard master brake cylinder.

### 1. Regenerative braking

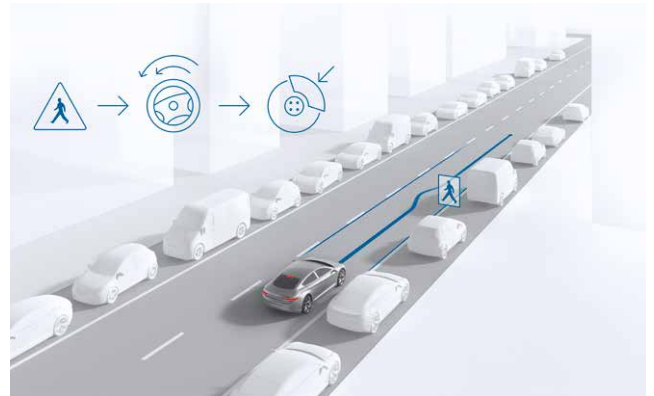


The iBooster enables full recuperation with deceleration values of up to 0.3g when combined with ESP® hev. This is due to the iBooster's ability to adjust the supporting force hydraulic conditions of the brake system in case of generator braking. This covers standard braking maneuvers and enables electric vehicles to increase their driving range by up to 20 percent. In hybrid vehicles, regenerative braking reduces fuel consumption and CO<sub>2</sub> emissions – particularly in the case of frequent braking and accelerating in urban traffic.

# best pedal feel

With the iBooster, the pedal characteristics can be adjusted from sporty to comfortable pedal feel.

### 2. Driver assistance and automated driving



The electromechanical design of the iBooster offers a host of benefits for driver assistance systems. Using the electric motor, the iBooster can build up pressure independently, without the need for the driver to apply the brake pedal. Compared with typical ESP® systems, the required braking pressure is built up three times faster and is adjusted with higher accuracy. This offers significant benefits for automatic emergency braking systems, for example. In a critical situation, the iBooster can automatically build up the full braking pressure much faster and shortens the braking distance significantly. This not only helps to shorten braking distances, but, if a collision is unavoidable, it also helps to reduce the impact speed and risk of injury to all parties involved. In combination with the ESP® from Bosch, the iBooster provides the brake system redundancy required for automated driving. Both systems have a direct mechanical push-through on the brakes and can brake the vehicle independently over the entire deceleration range.

## TECHNICAL CHARACTERISTICS

Supporting force	up to 8 kN
Voltage range	9.8 – 16V (main operation range)
Required space	equal to 8+9" vacuum brake booster
Weight	4.4 kg – 4.8 kg
Power consumption	< 1 A per 10 bar (at comfort pedal application)
Motor power	300W mechanical