

# **The ‘Brain’ Is Key to It All**

**What will it take to turn today’s highly advanced semi-autonomous vehicles into being “driverless?” In oversimplified terms, it is the addition of a driverless “brain” - plus a multitude of additional sensors, radar, GPS and cameras. Mercedes-Benz is collaborating with longtime supplier Bosch to build automotive autonomous “brains” -- driving systems for driverless Mercedes-Benz cars and heavy duty vehicles. The “brains” will use Nvidia’s Xavier Artificial Intelligence super chip and a Mercedes-Benz/Bosch program to provide Level 5 autonomy.**

**Level 4 designation describes an automated car than can drive itself under most, but not all, road conditions. The ultimate step is Level 5 autonomy, which basically means the “brain” is capable of actually steering and driving the vehicle in a wide variety of driving conditions on a variety of roads and traffic and weather conditions, without human intervention.**

**[Insert Image: “BRAIN1.jpg;” caption: The driverless “brain” being developed especially for Mercedes-Benz autonomous vehicles processes trillions of inputs in mille seconds to direct the vehicle’s actions.]**

## **Miniature Super Computer, Trillions of Activities in Mille-Second**

**The driverless brain, about twice the size of a small computer tablet, will be a miniature, incredibly powerful super computer capable of trillions of diverse activities in a mille-second, utilizing technology developed through arduous learning, extensive repetitive input and sophisticated testing under driving conditions specifically for Mercedes-Benz driverless vehicles.**

**The brain will factor in and follow highly detailed, up to the minute mapping of whatever course the car is asked to take. This mapping will be include route markers, stop signs and traffic signals, blockages, tunnels and incredible detail crucial to the success – or lack of it -- for driverless cars. The driver will not just head out on any road on a whim, but will feed into the brain the ultimate destination, exact path to be taken, the route**

**numbers, posted speed limits, and any unusual elements.**

**This will all be available from a cloud service, and will provide the vehicle virtually all information needed to begin and successfully complete the trip. Absolutely latest map information will be essential to avoid any bad moves on the trip due to outdated information. All of the highly advanced driverless features, along with the rest of the vehicles, will need checking to ensure proper operation, calibration, recalibration or re-installation whenever there is collision repair, again regardless of the driver or lack of driver.**

**—and additionally:**

- Active Lane Change Assist. Touching the turn signal as if in a three-flash-to-pass signal, relevant sensors make sure a lane change will not cross a solid lane marker or risk a collision, and if lane change is safe within 10 seconds of signaling, the car steers into the intended lane. If needed it will accelerate to resume the set speed while the flasher continues flashing until change is made.**
- Active Speed Limit Assist. Using map data with camera-based traffic sign**

**recognition, the car obeys the speed limit. The traffic-sign recognition system also warns the driver not to make prohibited turns or entering one-way roads the wrong way.**

- **Active Emergency Stop Assist.** If the driver fails to put hands on the wheel for too long while also failing to touch the accelerator or brake, the car will be brought to a stop in the lane, switching on the flashers below 35 mph. After stopping doors are unlocked and an emergency call is made seeking assistance.
- **Car-To-X Communications.** S-Class and new E-Class vehicles sharing live traffic information about icy road conditions or hard braking events, and also pass along certain infrastructural information from organizations that partner with Mercedes-Benz. In the US this could mean information from the mapping/traffic-info aggregating firm "Here," partly owned by Mercedes-Benz.
- **Traffic-Jam Assist.** As it already has, adaptive cruise system will follow the car in front all the way to a stop, but now will automatically resume following the car in front if that car moves off again within 30 seconds.

- **Remote Parking Assist.** At the end of a journey, the semi-autonomous S-Class can park itself with the parallel and perpendicular park assist function, or the driver can exit the vehicle for narrow and barely accessible spots and use a smartphone app to maneuver the car up to 50 feet away. The car will negotiate around obstacles and fold the mirrors if this is needed.

**With “brains” this could be exciting!**

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