

MODEL 211.0 /2 as of 1.6.06
except CODE (494) USA version
except CODE (498) Japan version
MODEL 211.0 /2 as of 1.7.06
with CODE (494) USA version
with CODE (498) Japan version
MODEL 219.3

B24/15 Yaw rate and lateral acceleration sensor

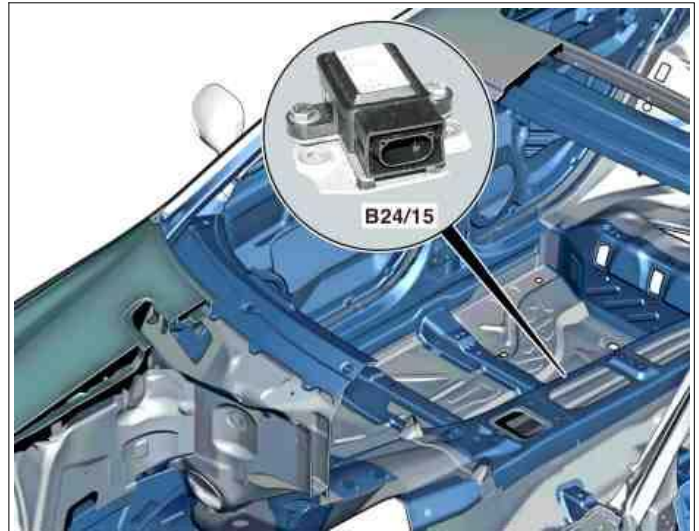
Location

The yaw rate and lateral acceleration sensor is under the front passenger seat on the vehicle floor.

Task

Recording the yaw rate (yaw angle rate) of the vehicle about the vertical axis and the lateral acceleration.

i The ESP control unit (N47-5) uses the yaw angle velocity, the lateral acceleration and the steer angle of the front wheels (calculated from the steering wheel angle) to determine the lateral forces on the wheels.



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Design

Combined sensor for yaw rate and lateral acceleration in a micro-mechanical design.

Function

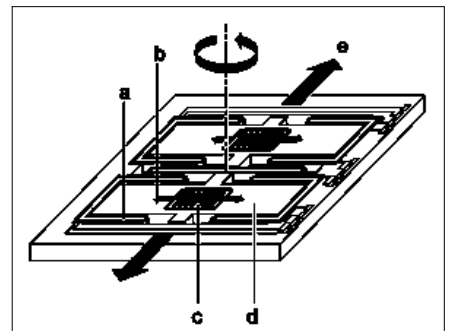
The sensors for yaw rate and lateral acceleration are combined in the yaw rate and lateral acceleration sensor. The micromechanical system of sensors converts the different accelerations of the vehicle about its transverse and perpendicular axis into electrical signals which can be evaluated due to the deflection of vibrating masses.

The different types of masses are deflected differently according to the movement of the vehicle (cornering or decelerating). The electronic analysis system records these signal changes and passes them on to the ESP control unit.

- a Spring
- b Vibration direction
- c Acceleration sensor
- d Vibrating member
- e Sensing direction

Yaw rate sensor, partial function

The movement of the vehicle causes both vibrating members (d) to vibrate horizontally. If, as a result of rotary motion of the vehicle (skidding), a rotary motion is superimposed on this linear motion, a force (Coriolis force) acts on the vibrating members (d). The electronic analysis system calculates the rotational speed from the changes in the vibration states.

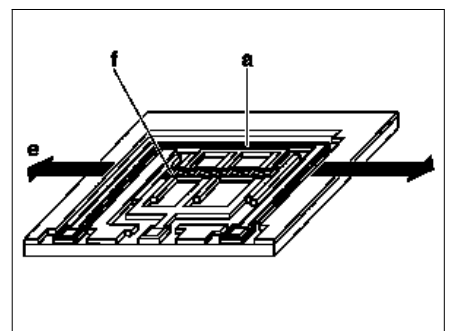


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- a Spring
- e Sensing direction
- f Seismic mass

Lateral acceleration sensor, partial function

The electronic analysis system controls the inert seismic mass so that it is held at its initial position. The lateral acceleration is then determined by the voltage required to maintain the initial position during operation.



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