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Service Tips and Best Practices

Steering Angle Sensor and Suspension Component Replacement

Brand	All	Product	All	Date	April 2021
Part Number(s)	N/A				

Modern passenger vehicles are equipped with Electronic Stability Control (ESC) systems designed to increase overall road safety. An ESC system is normally compromised of several sensors which work in conjunction with an ESC or ABS module. These sensors include but are not limited to:

- Wheel spend sensors
- Yaw rate sensor
- Lateral acceleration sensor
- Steering torque sensor
- Steering angle sensor

Furthermore, vehicle features such as Autonomous Driving, variable assist power steering or electric power assisted steering (EPAS), Advanced Driver Assistance Systems (ADAS) such as Lane Keep Assist (LKA) or Adaptive Cruise Control (ACC), also rely on inputs from the above sensors.

After replacing a suspension component, such as a tie rod end, control arm or wheel bearing or performing a vehicle alignment, typically a recalibration and or relearn of the steering angle sensor for correct operation of the ESC system may be required.

Although ESC modules incorporate a zero point which may permit a few degrees of tolerance in wheel offset, the replacement of a suspension component may create a condition wherein sensors do not “agree”.

For example, the yaw rate sensor may report zero yaw acceleration, whereas the steering angle sensor may report a turning angle outside of the allowable tolerance range due to the new component. A similar situation may arise after performing a vehicle alignment.

Until these values are reconciled via recalibration, the ECS system may not operate correctly or otherwise become temporarily disabled. The below are some but not all observable indicators:

- ABS, TCS or CEL warning on the dash
- Erratic movement or excessive feeling of looseness in the steering wheel, especially in vehicles equipped with EPAS or electric power steering
- Unexpected or improper operation of vehicle features such as LKA or ACC

Depending on vehicle make and model, a steering angle sensor may be recalibrated using a scan tool or through a self-relearn procedure. Ensure to verify which method is applicable. Additionally, this operation is normally performed on flat and level ground, versus on the lift. Always ensure to reference original factory service manual for proper diagnostic, removal and replacement procedures and all related specifications and values.