WHAT YOU NEED TO KNOW:
ADVANCED DRIVER ASSISTANCE SYSTEMS & STEERING AND SUSPENSION REPAIR

Modern vehicles use sensor inputs for a variety of safety, ride control and comfort functions. These sensors work together in a network. Here's what you need to know for a successful repair outcome.

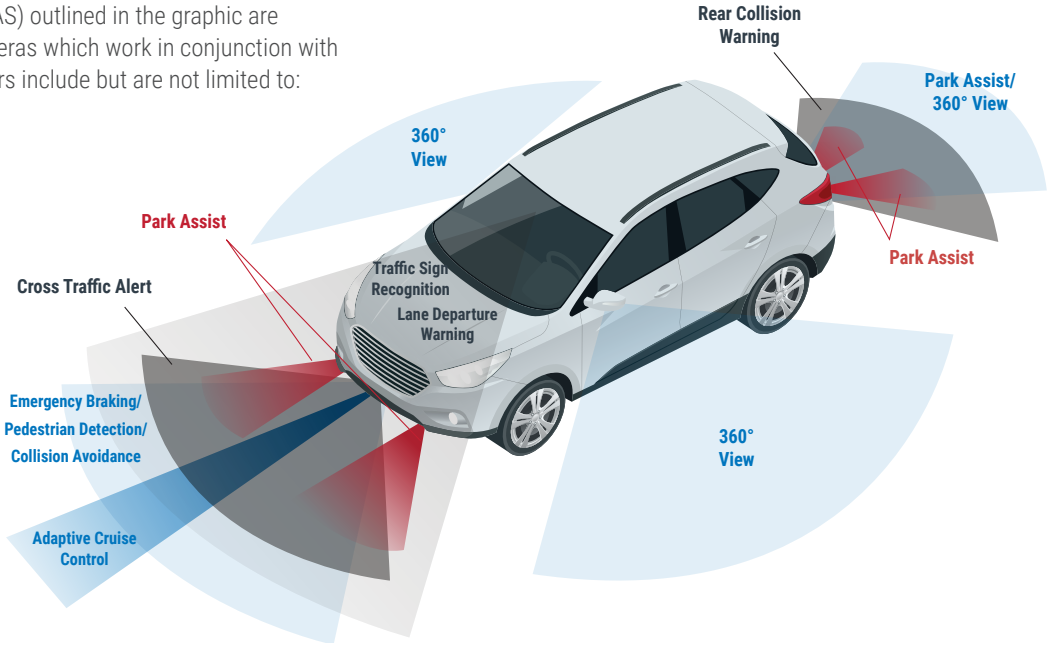
ADAS OVERVIEW

Advanced Driver Assistance Systems (ADAS) outlined in the graphic are compromised of several sensors and cameras which work in conjunction with body and ESC/ABS modules. These sensors include but are not limited to:

- Wheel spend sensors
- Yaw rate sensor
- Lateral acceleration sensor
- Steering torque sensor
- Steering angle sensor
- Level or ride height sensor

Data from these inputs may also be used for:

- Engine management
- Transmission management
- Navigation and telemetry
- Ride and or chassis control (active, adaptive and or semi-adaptive suspension)
- Adaptive illumination



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REPAIR TIPS

To ensure an optimal repair, after completing steering or suspension repair on a vehicle equipped with ADAS, follow these tips:

- ☐ Resecure all steering, suspension and wheel-end sensors. Ensure there is no binding, pinching or impinged movement of the sensor wiring or armature.
- ☐ Perform vehicle alignment to restore suspension geometry and minimize:
  - Unwanted loading and or premature failure of the new component
  - Rolling resistance and or unnecessary friction
  - Excess tire wear
  - Impaired vehicle handling and comfort
  - Poor fuel mileage
- ☐ Check all mounting fasteners are correctly torqued at correct vehicle ride height
- ☐ Perform calibration and/or relearn of vehicle's Advanced Driver Assistance Systems

RECALIBRATION IS IMPORTANT

Although most sensors and modules incorporate a zero point which may permit a few degrees of tolerance in wheel offset, replacing a suspension component may create a condition where sensors do not "agree".

For example, a yaw rate sensor may report zero yaw acceleration, but the steering angle sensor may report a turning angle outside of the allowable tolerance range due to the new component.

This can also arise after performing a vehicle alignment. Until these values are reconciled via recalibration, ADAS, ESC/ABS/TCS functions may not operate correctly or otherwise become temporarily disabled.

WHAT TO LOOK FOR:

- ☐ ABS, TCS or CEL warning on the dash
- ☐ Erratic movement or excessive feeling of looseness in the steering wheel, especially in vehicles equipped with electric power steering
- ☐ Unexpected or improper operation of vehicle features such as cruise control or lane departure/lane assist

Depending on vehicle make and model, sensors 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.

FOUR-WHEEL ALIGNMENT & ADAS

With the popularity of four/all wheel drive vehicles and the mandatory implementation of ESC systems, it is essential to verify all alignment angles, especially thrust angle, by performing a four-wheel alignment after replacing a steering and or suspension component.

An incorrect thrust angle value may not only manifest itself as an off-center steering wheel and vehicle drift/pull but for example, also may trigger a non-requested activation of the ECS/ABS system as it attempts to compensate for a perceived understeer condition. This out of specification condition may also impact the correct operation of ADAS features.

A Four-Wheel Alignment measures toe, camber and caster values and adjusts those which are applicable but additionally confirms if all four wheels are "square", relative to each other and that there is no significant front end versus rear end offset.

2200