

# ADAS and its Impact on Wheel Alignment

Advanced Driver Assistance Systems (ADAS) are a group of safety functions designed to improve driver safety and reduce the severity and number of traffic accidents. Today, the world of ADAS is continuously expanding and affecting the wheel alignment business. It monitors how the vehicle is traveling down the road to accurately make predictions and safety corrections. Vehicles equipped with ADAS, especially lane keep assist and collision braking, need to be properly aligned so the systems receive the correct signals about how the vehicle is traveling. ADAS is to the wheel alignment industry, what fuel injection was to the automotive carburetor repair industry thirty years ago. The most common questions about ADAS are:

- How much space is needed?
  - Space
  - Equipment Requirements
- When is ADAS system recalibration necessary?
  - Types of Calibrations
  - When is recalibration required?
- What is needed to successfully perform the recalibration?
  - ADAS Recalibration Area
  - OEM Calibration Method
  - Pre-Alignment Inspection
  - Wheel Alignment
- Is a scan tool required?
  - ADAS Calibration

## Space

Recalibration targets must be positioned a certain distance from the centerline of the front axle or rear axle, depending on which camera (front or rear) is required. The distances will vary by manufacturer. Total space is required is approximately thirty-eight feet for the majority of the vehicles but can be as much as fifty feet for some.

## Equipment Requirements

- A modern imaging wheel alignment machine capable of producing vehicle dimensions such as wheelbase front and rear track width, cross dimensions and rolling radius
- A scissors or four post wheel alignment platform (rack) with floating front turn tables and full floating rear slip plates not a service rack
- A scan tool with the latest software and firmware updates
- An EZ-ADAS recalibration system with targets, target stands, and vehicle centerline laser system
- A repair information system such as ProDemand or Shopkey

The information system contains labor rates and repair times for ADAS component. ADAS recalibration is not a flat rate charge function. The recalibrations vary from one manufacturer to

the other and from one make model year to the next model year. Always follow the OEM manufacturer's prescribed procedure.

## **Types of Calibrations**

There are two types of calibration methods. The first is a static calibration requiring the use of targets and scan tool. The second is a dynamic calibration where the vehicle is driven through a drive cycle. In most cases, the dynamic method only requires a scan tool to validate the completion of the drive cycle and calibration.

Static calibration involves pre-conditioning the vehicle per the OEM manufacturer's specification which includes a thorough vehicle inspection. Items often overlooked in the past such as tire sizes, air pressure, fuel level and ride height are critical for a successful ADAS systems calibration. A vehicle's on-board computer pre-and post-scans are equally important and must be performed before a calibration can occur. Results should be documented and stored.

## **When is recalibration required?**

OEMs may recommend ADAS recalibration after a wheel alignment. Recalibration is required if the vehicle was in a collision and repaired or sensors were removed, replaced, or disturbed to access other components. Information systems can be very useful in determining when a recalibration needs to be performed. In this system, simply click on the ADAS icon. In this case, the information is clear, for when to recalibrate and what is needed, targets, and/or scan tool.

## **ADAS Recalibration Area**

The ADAS calibration area must be flat and level free of high contrast patterns and well light. The area must also be uncluttered and clean.

## **OEM Calibration Method**

The large majority of OEMs require a system capable of using the vehicle's mechanical centerline as the main reference point for ADAS calibration. The centerline of the vehicle is a known permanent reference line where the rear wheel reference is a variable reference line and can change. The vehicle must be placed on a level surface free of objects and obstacles. The calibrations must be performed inside. Except for a few manufacturers, front camera calibrations cannot be performed with the vehicle parked on the alignment rack.

## **Pre-Alignment Inspection**

Bring the vehicle to the alignment area, attach a scan tool and perform a vehicle systems pre-scan. If codes are present, repair all code related failures before proceeding. If the vehicle clears the pre-scan continue with the pre-alignment inspection. Before the wheel alignment, perform the mandatory inspection, observe and document tires for matching sizes and types. Measure and record tire tread depth on all the tires. Measure and document tire pressures. Observe and record all DOT numbers on the tires including the spare tire. Remove all non-necessary loads from the

vehicle and add the necessary loads as prescribe by the vehicle manufacturer. Measure and document the ride height on all four corners. If the ride is out of manufacturer's specification, correct the ride height by replacing the proper components or adjusting the height in the case of an air suspension for example. The ride height is a critical component in ADAS calibration because the cameras, radars, or LIDARS, are mounted in a precise location on the vehicle. If the ride height is too low or too high the camera's height relative to the ground will be incorrect and a calibration error can occur.

### **Wheel Alignment**

Install a battery maintainer or charger on the vehicle's battery to provide auxiliary power to the vehicle while performing the wheel alignment procedures. The ignition key will be on for an extended period of time and the vehicle's battery may drain to a critical value. Align the vehicle to the vehicle manufacturer's preferred specifications including the addition of loads. Adjust the rear thrust angle as close to zero as practical.

### **ADAS Calibration**

Select the proper target(s) for the vehicle being calibrated. The EZ-ADAS system has a book which includes what target to use, where to place the target stand, how high to elevate the horizontal axis and where to center the target(s) on the horizontal axis. Position the target(s) in the proper location. Find the vehicle's centerline, center the target stand on the vehicle's centerline, adjust the height of the target stand horizontal axis and adjust the target or targets position on the horizontal axis. Once the targets are in the proper location in front of the vehicle, or behind in the case of a rear camera, connect the scan tool, select the vehicle, access the system to be recalibrated and invoke the recalibration process. When completed, document the event and run a post scan.

### **Conclusion**

An ADAS recalibration process starts with a thorough vehicle inspection, a complete scan of all on-board computers, and a wheel alignment. The second part is to bring the vehicle to the ADAS area, position the target boards, install the scan tool, invoke the calibration procedure for the system being recalibrated, record and document the results, and finally drive the vehicle to confirm the calibration is complete.