

FORD AND LINCOLN ADAS JOB AID

IMPORTANT: The information in this document is for reference only.

- References to component locations on vehicle are approximate and may vary by vehicle and/or vehicle trim level.
- Refer to Ford Workshop Manual (WSM) for further information including: description and operation, component location, diagnosis and testing, repair and calibration.

INTRODUCTION

Many Ford vehicles are equipped with Advanced Driver-Assistance Systems (ADAS) to help warn drivers and mitigate hazards. These ADAS components may require additional calibration steps or vehicle programming after the component or related components have been removed, replaced, or serviced. This job aid covers the component description, component location, and the required calibration steps of each advanced driving support system. When servicing or calibrating any ADAS component, the Ford Workshop Manual procedures should always be followed.

ADAS Descriptions

| System | | Abbreviation | Description |
|--------------------|----------------------------|--------------|--|
| 360 Degree Cameras | Front Parking Aid Camera | — | <ul style="list-style-type: none"> - The image starts with a 360° overhead view displayed on the Front Display Interface Module (FDIM) touchscreen. - Some vehicles, such as the 21 Mach-E, F-150 & Bronco, do not have a FDIM. They call it an Audio System Display. - The 360° view provides different camera views to assist the driver while maneuvering the vehicle no greater than 10mph. |
| | Rear Parking Aid Camera | | |
| | RH Side Parking Aid Camera | | |
| | LH Side Parking Aid Camera | | |
| Active Park Assist | Parallel Parking | APA | <ul style="list-style-type: none"> - The IPMA uses input from the active park assist sensors, parking aid sensors and a geometrical equation to determine whether the vehicle fits in the parking space. The system visually and/or audibly instructs the operator to park the vehicle through messages in the centerstack infotainment display and audio system warning chimes. - The system uses the following modules to help in parking the vehicle: <ul style="list-style-type: none"> • Parking Assist Control Module (PAM) • Power Steering Control Module (PSCM) • Steering Angle Sensor Module (SASM) • Anti-lock Brake System (ABS) module • Instrument Panel Cluster (IPC) - The system also uses sensors such as the ultrasonic active park assist sensors. |
| | Parallel Park Out Assist | | |
| | Perpendicular Parking | | |



ADAS Component Description (cont'd)

| System | | Abbreviation | Description |
|--|--------------------|--------------|---|
| Adaptive Cruise Control | | ACC | - The ACC system automatically adjusts the vehicle speed to maintain a set distance gap from the front of the vehicle and the vehicle in the same path of travel. |
| | | | - ACC with Stop-and-Go feature uses radar and camera sensors to maintain a set gap between your vehicle and the vehicle in front of you while following it to a complete stop. |
| Adaptive Learning | | | - The electronic power steering system adaptive learning improves overall handling and steering on roads with irregularities. It communicates with the brake system to help operate advanced stability control and accident avoidance systems. |
| Adaptive Steering | | | - The adaptive steering system continually changes the steering ratio with changes to the vehicle speed, optimizing the steering response in all conditions. |
| Blind Spot Information System | | BLIS | - When the system detects a vehicle, an alert indicator illuminates in the exterior mirror on the side the approaching vehicle is coming from. If you turn the direction indicator on for that side of your vehicle, the alert indicator flashes. |
| Blind Spot Information System with Trailer Tow | | | - The detection area is on both sides of your vehicle and trailer, extending rearward from the exterior mirrors to the end of your trailer. |
| Cross Traffic Alert | | CTA | - The system alerts you of vehicles approaching from the sides behind your vehicle when you shift into reverse (R). |
| Driver Alert System | | | - The system automatically monitors your driving behavior using various inputs including the front camera sensor. If the system detects that your reduced driving alertness is below a certain threshold, the system alerts you using a tone and a message in the cluster display. |
| Lane Keeping System | Lane Keeping Alert | LKS | - Detects when a vehicle is close to leaving the lane without turn signal input. The lane keeping system activates an actuator in the Electronic Power Assist Steering (EPAS) to vibrate the steering wheel, warning the driver they are close to leaving the lane. |
| | Lane Keeping Aid | | - Provides steering input toward the center of the lane when an unintended lane departure is detected. |
| Pro Trailer Backup Assist | | PTBA | <ul style="list-style-type: none"> - The PTBA control knob, located in the dashboard, allows the driver to control the direction of the trailer and control how much the system should turn the trailer. - The PTBA system automatically steers the vehicle to turn the trailer the desired amount by taking over the steering while the driver remains in control of the accelerator and brakes. - The system may limit vehicle speed to enhance the comfort and control over a variety of road surfaces. - When using the target sticker the system is using the camera to track the angle of the trailer vs the position of the vehicle. |



ADAS Component Location

| Component | ADAS Component Location |
|---|---|
| Anti-Lock Brake System Module | Location varies between vehicle lines. |
| Cruise Control Module | In the front of the vehicle typically behind the front bumper cover. |
| Lane Keeping Camera | On the top edge of the windshield. |
| Head Up Display Module | On top of the instrument panel on the driver's side at the base of the windshield. |
| Image Processing Module A | On the windshield, below the interior rear view mirror. |
| Image Processing Module B | Location varies between vehicle lines. |
| Parking Assist Control Module | Location varies between vehicle lines. |
| Front Parking Aid Camera | In the center of the front grille below the center emblem. |
| Front Parking Aid Sensors | Four sensors along the front of the vehicle on the front bumper. |
| Front Active Park Assist Sensors | In the front bumper on each side of the vehicle. |
| Rear Parking Aid Camera | In the tailgate on pickups, in the rear decklid on passenger cars, and in the liftgate on SUVs. |
| Rear Parking Aid Sensors | Four sensors along the back of the vehicle in the rear bumper. |
| Rear Side Sensors | In the rear bumper on each side of the vehicle. |
| RH Side Parking Aid Camera | On the underside of the RH exterior rear view mirror. |
| LH Side Parking Aid Camera | On the underside of the LH exterior rear view mirror. |
| Side Obstacle Detection Modules (SOD-R and SOD-L) | Behind the rear bumper on both sides of the vehicle. |
| CCM Radar Sensor | In an opening in the front fascia or bumper behind an unpainted plastic cover. |

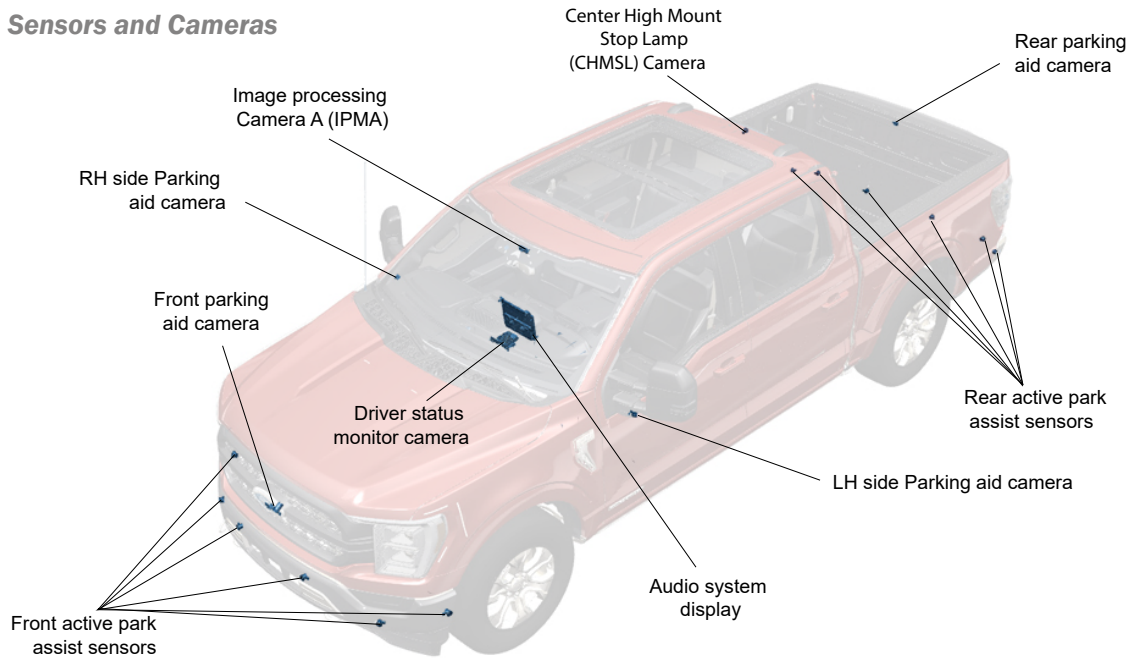




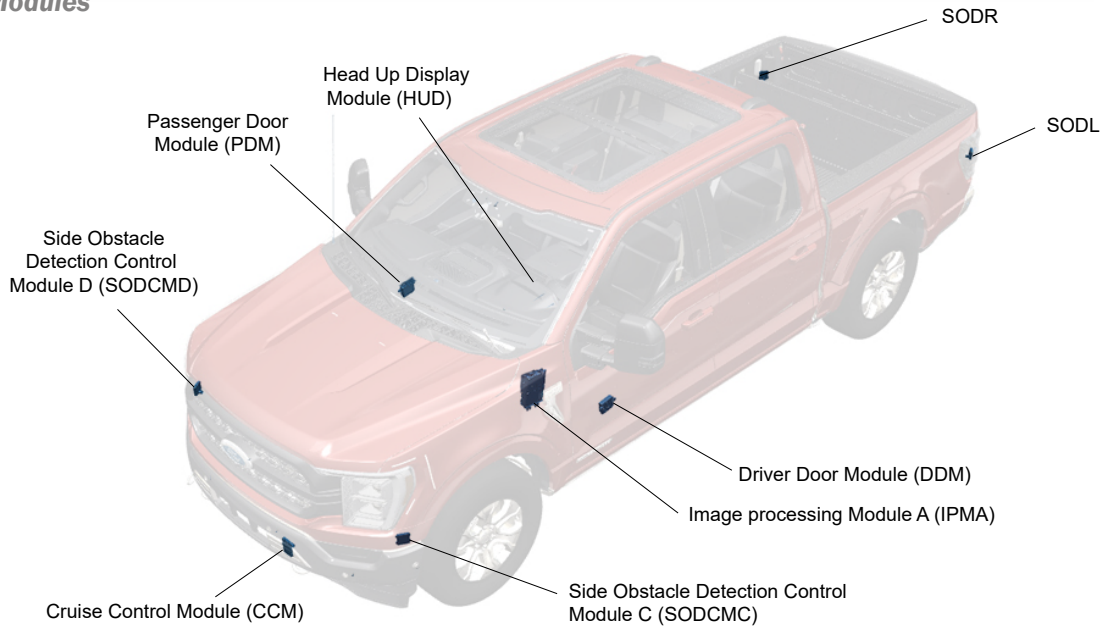
2021 F150 ADAS Location Views



Sensors and Cameras



Modules



ADAS Component Calibration

NOTE: It is important to note that the driver assist systems are intended to work on the vehicle as it is designed. Any aftermarket alteration could cause a system to malfunction or not accept a correct calibration.

| Component | | When is Calibration Required | Notes |
|---------------------------------|------------------------|---|--|
| 360 Degree Cameras | Front Camera | - When any camera is replaced or removed from the vehicle, the parking aid camera alignment must be performed. | - Elevation System Check and Azimuth System Check must be performed |
| | Rear Camera | - When a camera or any body component that a camera is attached to is removed or adjusted, the 360 degree view camera alignment must be performed. | - Elevation System Check and Azimuth System Check must be performed |
| | LH and RH Side Cameras | - When a camera or any body component that a camera is attached to is removed or adjusted, the 360 degree view camera alignment must be performed. | - Azimuth System Check must be performed |
| ADAS Module | | - New ADAS module is installed | - Programmable Module Installation |
| Anti-Lock Brake System Module | | - New ABS module is installed | - Programmable Module Installation - ABS Calibration - EPB Initialization - PCM PATS Programming Application - Module Initialization |
| Head Up Display Module | | - A new HUD is installed | - Programmable Module Installation |
| | | - The HUD is removed and reinstalled or replaced - The instrument panel is removed and installed or replaced - A new windshield is installed | - HUD Calibration <ul style="list-style-type: none"> If the system is not calibrated, the images may be distorted or display improperly. |
| Image Processing Module A | | - New IPMA is installed | - Programmable Module Installation - IPMA Camera Alignment |
| Image Processing Module B | | - New IPMB is installed | - Programmable Module Installation - Parking Aid Camera Initialization - 360 Degree View Camera Alignment |
| Lane Keeping Camera | | - When a windshield, camera or IPMA is replaced - If the windshield is removed for structural repairs that affect windshield position - Change in tire size - Suspension repair or alignment - Front air bag deployment | - IPMA Camera Alignment - Lane keeping systems are developed and calibrated based on the manufacturer's specified ride height and wheel/tire combinations. If the ride height or wheels have been altered this will affect system accuracy. |
| Side Obstacle Detection Modules | | - New SODL or SODR module is installed | - Programmable Module Installation |



ADAS Component Calibration (cont'd)

| Component | When is Calibration Required | Notes |
|--|---|---|
| Cruise Control Module and Radar Sensor | - New CCM is installed | - Programmable Module Installation - Cruise Control Radar Alignment |
| | - When a vehicle has been in an accident | - The radar sensor requires a vertical check and adjustment. - After the vertical check and adjustment, a horizontal alignment procedure must be performed during the road test using the calibration routine found in the diagnostic scan tool. |
| | - Whenever the sensor itself or the bracket support in which it is mounted is removed from the vehicle for access | - The radar sensor requires calibration, consisting of a vertical mechanical adjustment followed by a horizontal alignment. |
| Parking Assist Control Module (PAM) | - New PAM is installed | - Programmable Module Installation |
| Parking Aid Sensors | - Whenever a sensor is removed and reinstalled or replaced | - Azimuth System Check must be performed |
| Active Park Assist Sensors | - Whenever a sensor is removed and reinstalled or replaced | - Azimuth System Check must be performed |

