



Service Point Target Auto Calibration (SPTAC)

This procedure provides a way to calibrate the camera by having the service technician align the car to a well lit simulated straight road target; preferably wall mounted.

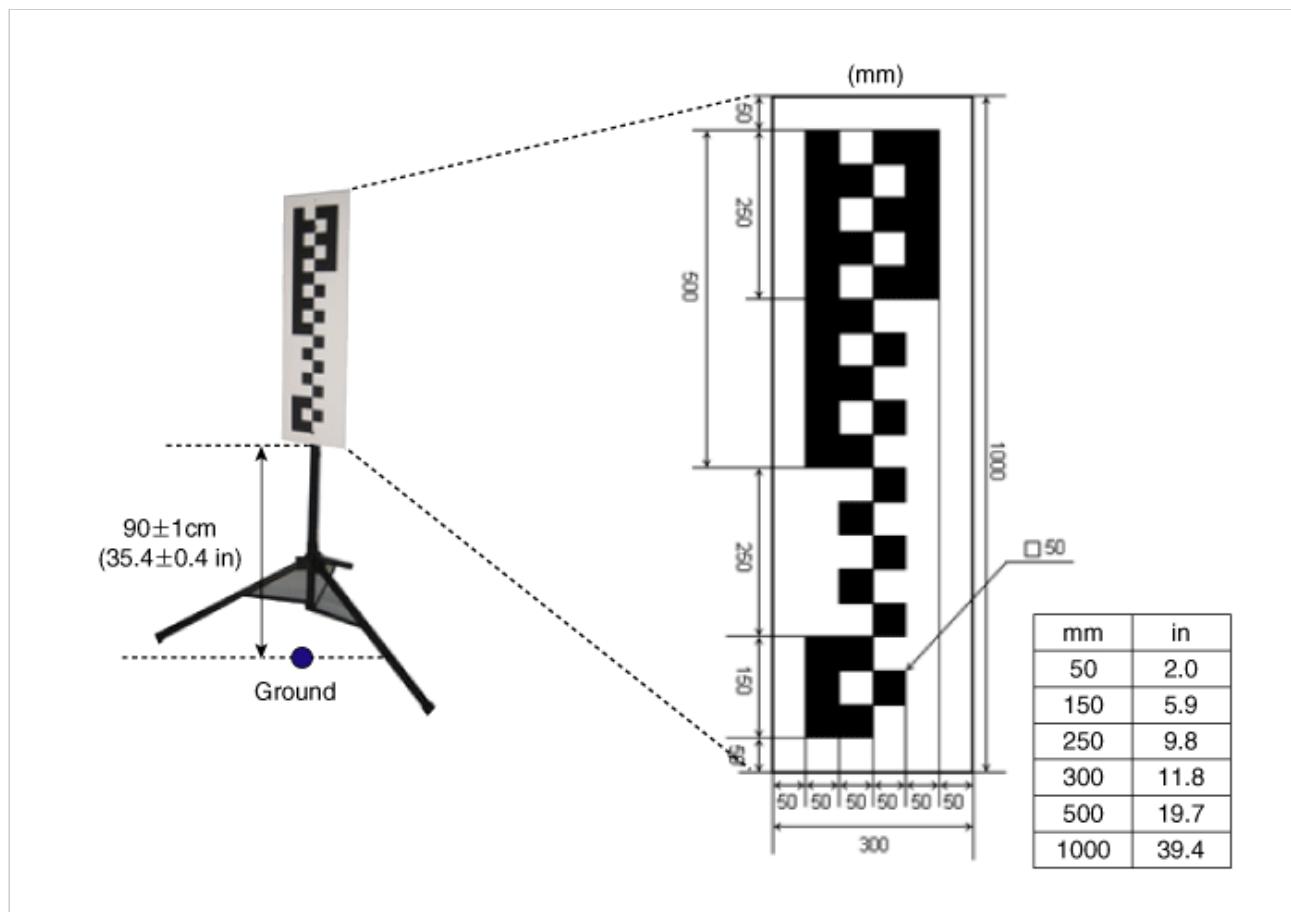
The LKA camera will have a "System Out of Calibration" DTC set if not operating within specified tolerances.

The LKA will be supplied for field service replacement with the "System Calibration Required / Variant Coding Error" DTC set if it is a replacement part delivered directly from supplier manufacturing.

1. Guidelines for Selecting a Suitable Target

In order for LKA Service Calibration-Static routine to complete successfully, the following conditions are required:

- Target (SST : 09890-3V100) surface is perpendicular to the camera in both horizontal and vertical orientations to maintain maximum of 1° roll.
- Target to be mounted to rigid backer material to maintain flatness requirements.
- Target has reflective (not faded or poorly painted) markings that are unlike from lane features.
- Target is 30 cm wide and 100 cm tall.
- Mounting area must NOT have cross hatch patterns or textual markings near the target.
- Target should be well lit for optimal performance using non-fluctuating illumination. There shall be no continuous shadows cast on the target.



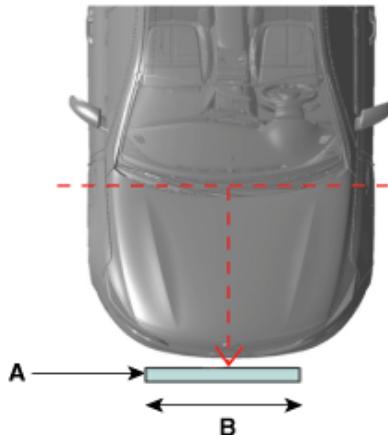
2. Service Point Target Auto Calibration Procedure

- (1) It is recommended to check vehicle toe-in and tire pressure levels to ensure proper alignment of the camera to the "world" before proceeding with calibration. The vehicle to run the calibration routine is to be at nominal production loading capacity.
- (2) Windshield must be clean and silk-screen checked so that there is no blockage of the camera.
- (3) Service technician connects the diagnostic connector and starts the vehicle. The camera module should not be activated by pressing the switch.
- (4) The service calibration routine may not run correctly if any system level fault is active.
- (5) If working with a replacement ECU: the service technician initiates the SPTAC Reset configuration.
- (6) Service technician either aligns the vehicle to the target or the target to the vehicle.
 - a. Bottom of the target is 90 ± 1 cm (35.4 ± 0.4 in.) from the ground and aligned with the camera lens horizontal axis.

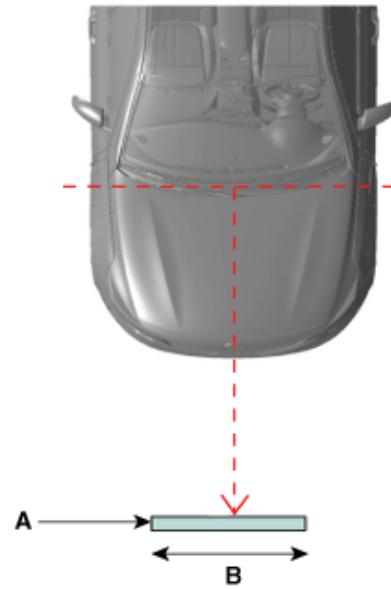
Information

- The target (A) is placed along the vehicle's longitudinal axis (centerline) within ± 3 cm (± 1.2 in.) of target center. (Horizontal deviation (B) : ± 3 cm (± 1.2 in.))

[The position of target in short distance]

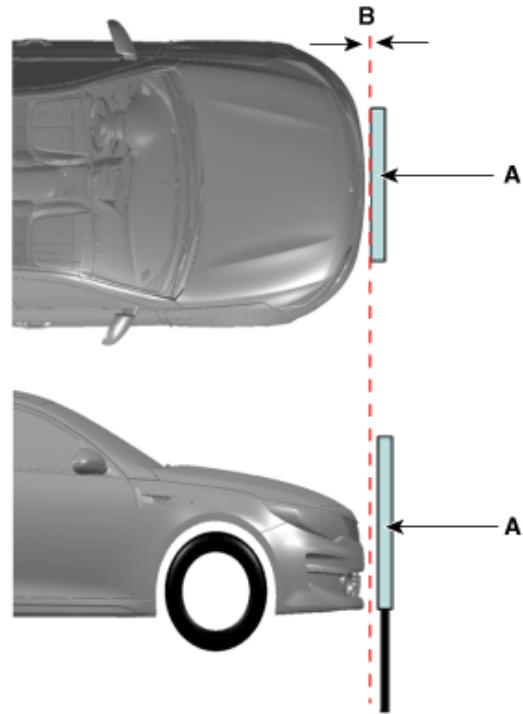


[The position of target in long distance]

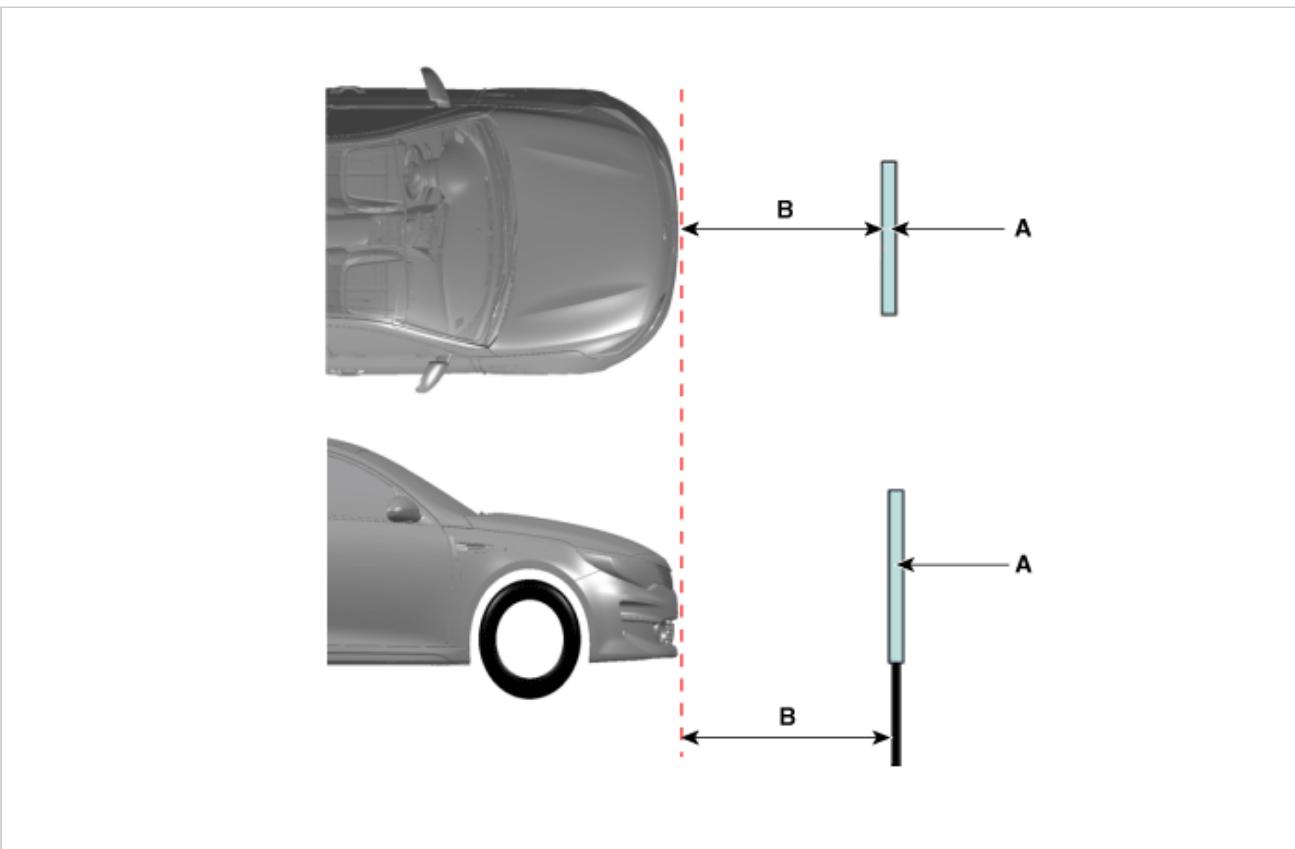


Horizontal deviation (B) : $\pm 3\text{cm}$ ($\pm 1.2\text{ in.}$)

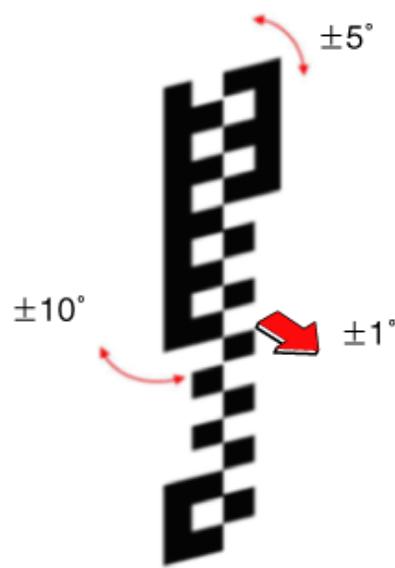
b. The position of target (A) in short distance is $0 \pm 5\text{ cm}$ ($0 \pm 2\text{ in.}$) (B) in front of front bumper.



c. The position of target (A) in long distance is $100 \pm 5\text{ cm}$ ($39.4 \pm 2\text{ in.}$) (B) in front of front bumper.

**Information**

- The tolerance angle of target in horizontal direction is $\pm 10^\circ$.
- The tolerance angle of target in vertical direction is $\pm 5^\circ$.
- The tolerance angle of target in facade center is $\pm 1^\circ$.



<Tolerance angle of target in horizontal / vertical direction>

S/W Management

Systems **Components** **Unfold All**

- Around View Monitor
- Blind-Spot Collision Warning-Left
- Blind-Spot Collision Warning-Right
- Multi Function Camera
 - System Identification
 - SPTAC Calibration
 - Variant Coding
- Adaptive Front-Lighting System
- Auto Headlamp Leveling
- Active Hood System
- E-Shifter
- Amplifier
- Cluster Module
- Driver Door Module
- Head Up Display
- IBU-BCM

! Do not touch any system buttons while performing this function.

S/W Management



• SPTAC Calibration

Purpose	To calibrate the camera focal point.
Enable Condition	1.Engine Off 2.Ignition Switch On 3.Stand a referring panel in front of vehicle
Concerned Component	Lane Departure Warning System(LDWS) ECU
Concerned DTC	C2720XX, C2721XX, C2722XX
Fail Safe	Warning Lamp On
Etc	C1 : Inline Calibration C2 : A/S Calibration

OK



Do not touch any system buttons while performing this function.

Test Drive

NOTICE

The LKA may not activate properly in the following conditions.

- In case lane is not visible due to glare or heavy rain.
- In case the road is covered with snow.
- In case puddle on the road surface reflects street light or head light from oncoming vehicle.
- In case there is blocking object such as sidewalk on the side of the road.
- In case there is trace of more than one lane due to road repair.
- In case the distance with vehicle in front is very short.
- Be sure to perform test drive to check for normal operation after performing optical angle test.

- Drive on straight road (of longer than 500 m) with 2 white or yellow lane marks at speed of over 64 km/h (40 mph), and check for the alert as you intentionally steer close to the lane mark.
- LKA operates properly if the lane mark segment space is less than 8 m.
- LKA activates at vehicle speed above 64 km/h (40 mph).
- Perform test drive on car-only road or on a highway.

NOTICE

The lane keeping assist (LKA) may not operate in the following conditions:

- Lane lines are not visible due to rain, snow, dust, puddles, wet road surface or debris.
- The brightness outside the vehicle suddenly changes, for example, when entering a tunnel.
- The head lamp is not used or the light is too weak at night or while in a tunnel.
- The lane lines are not distinguishable from the road.
- The vehicle is on the bus lane or on the lane next to the bus lane.
- The road is curved too sharply or the slope of the road is too steep.
- Sunlight, street light, or lamp light of the on-coming vehicle is reflected on the wet road surface.
- The windshield or the camera lens is contaminated due to dust or debris.
- The visibility is poor due to bad weather such as fog, heavy rain, or heavy snow.
- The temperature around the rear view mirror is too high due to direct sunlight.
- The road lane is too narrow or wide.
- The lane lines are faint or damaged.
- Condensation on the windshield is not completely removed.
- A shadow of median strip covers the road lanes.
- The lane lines are not distinguishable from the road due to dust on the road.
- There are tracks or marks near the lane lines.
- A shadow of median strip, guardrail, sound-absorbing walls, or trees covers the road lanes.
- There is a line structure such as pavements.
- The distance from the preceding vehicle is too short or the preceding vehicle is on the lane lines.
- The vehicle is shaking intensely.
- Objects are on the crash pad.
- Backlight is lit in the direction of movement.
- The lane lines are too complex or are replaced by an alternate structure due to construction.
- The visibility is too poor to see the lane lines.
- There are two or more lane lines.
- The lane lines inside a tunnel are contaminated by dust or oil.
- There are road markings such as crosswalk or road signs on the road surface.
- The lane lines disappear or are not visible, for example, in a cross-section.
- The number of road lanes increases/decreases or the road lanes cross each other complicatedly.
- (Tollgate entrances/exits or divided/joined roads)

CAUTION

The lane keeping assist (LKA) prevents lane departures and helps the driver with steering, but the driver must not rely on the LKA, make a decision for safety on their own, and take necessary measures.

- This system warns the driver about unintended lane departures and assists the driver in case of any lane departure.
- Drivers are responsible for controlling their vehicle in order to drive safely.
- Do not turn the steering wheel too rapidly when the system sounds the alarm.
- This system is not activated when the vehicle speed is 60 km/h or less or the system fails to detect the lane lines.
- Do not tint or put stickers or accessories on the windshield around the rear view mirror.
- Keep the installation part of LKA dry.
- Do not remove or give an impact on LKA parts.
- Do not place reflective materials such as white paper or a mirror on the dashboard. They may cause malfunction due to reflected sunlight.
- Excessive noises may prevent the driver from hearing the LKA alarm sound.