



Ferrari North America

Technical Information

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Section:	7

Model Type: GTC4Lusso/GTC4LussoT/Portofino
Model Year: All
Subject: Calibration procedure for Surround View Node

Please find attached the correct procedure for calibrating the **Surround View** system (**NSW**) for the aforementioned models. The requirements for the work area used for the calibration procedure are also described in this document.

The calibration procedure is necessary in the event of any modification to the position (in X, Y and Z axes) of the cameras. The procedures after which calibration is always required are listed below:

- Any modification of vehicle suspension set-up;
- Removal/adjustment of front and/or rear bumper;
- Removal/adjustment of right and/or left rear view mirror;
- Removal/adjustment of tailgate (in the case of vehicles with rear camera mounted on tailgate). E.g: **Portofino**);
- Removal/adjustment of right and/or left door;
- Replacement of one of the four parking cameras;
- Replacement of **NSW** control unit.



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REQUIRED CONDITIONS FOR CALIBRATION

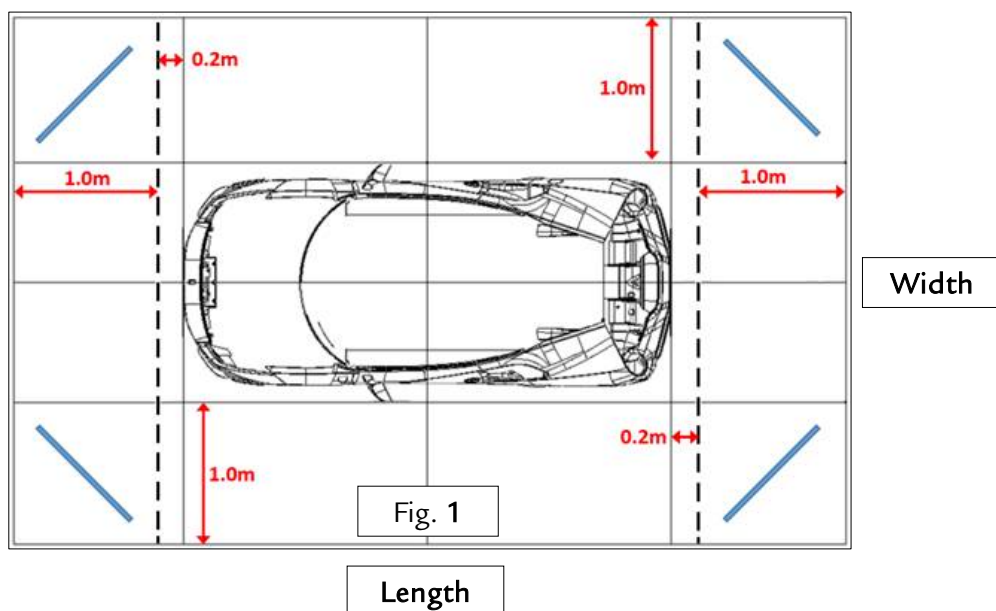
Minimum dimensions of calibration area

The area used for the calibration procedure must be large enough to accommodate the vehicle and the vertical target boards used by the system for the procedure. The minimum floor area necessary for the calibration procedure depends on the dimensions of the vehicle.

Where “L” is the length of the vehicle from the outermost point of the front bumper to the outermost point of the rear bumper, and “W” is the width of the vehicle including the rear view mirrors, the minimum dimensions of the area used for calibration are determined as follows:

- **Length:** $L + 2.4$ meters
- **Width:** $W + 2.0$ meters

The nominal positions of the vehicle and the vertical target boards within the calibration area are illustrated in Figure 1. The minimum dimensions of the calibration area defined above are determined from the dimensions indicated in the figure.

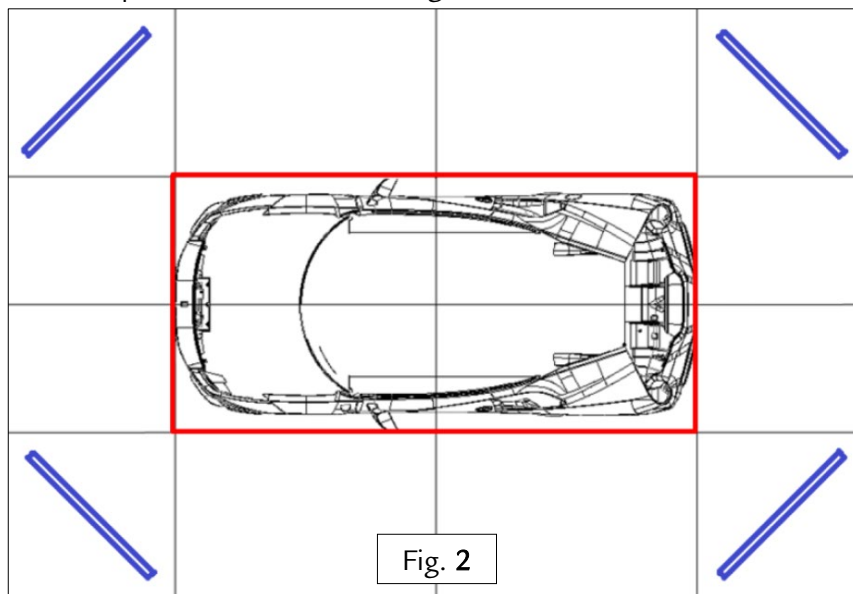




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Positioning the vehicle in the calibration area

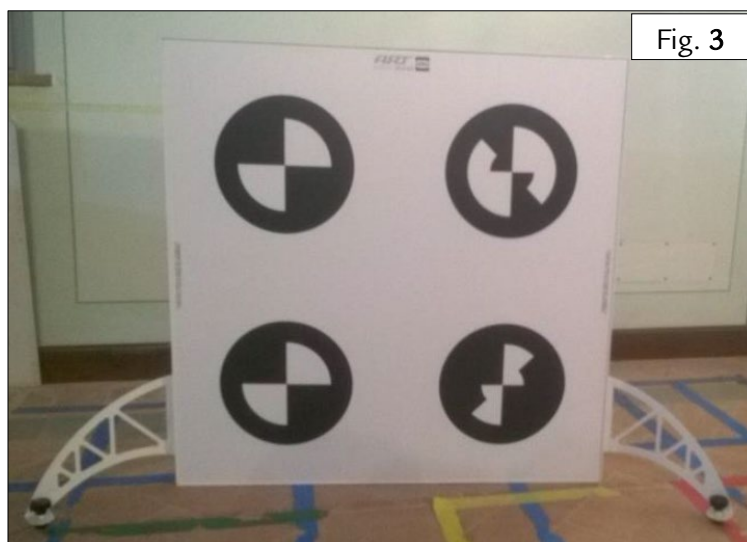
The vehicle to be calibrated must be placed within the rectangular zone with the dimensions **L x W** indicated in red – Fig. 2.



Orientation of the vertical target boards

The **Surround View** system uses 4 vertical target boards to calibrate the vehicle. Each board measures **1 meter x 1 meter** in size. 4 markers with 3 different shapes are printed on the front of each board.

Each vertical target board must be placed on the floor of the calibration area in the orientation shown in Figure 3. The two markers of the same type must be on the same vertical axis.





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Positions of vertical target boards

Place the 4 vertical target boards within the 1m x 1.2m zones extending outwards from the corners of the rectangle representing the overall outline of the vehicle including the rear view mirrors (light blue zones in Fig. 4)

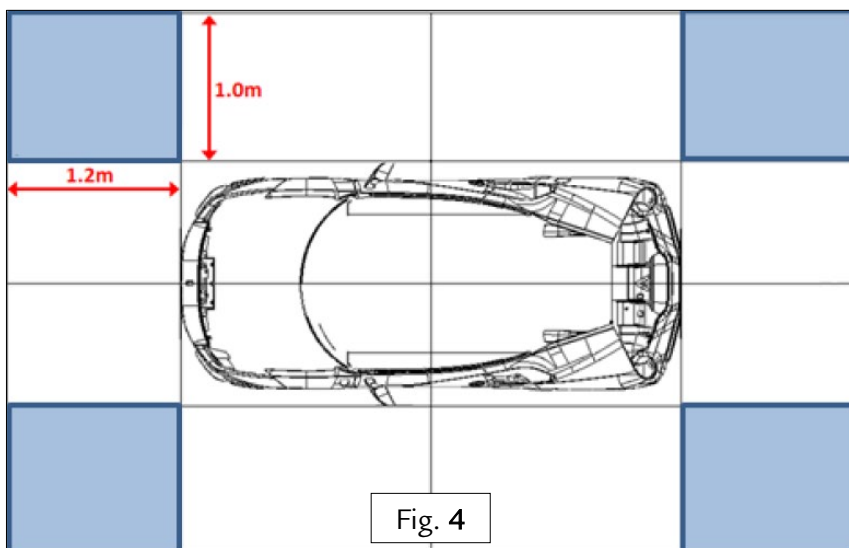


Fig. 4

Observe the following conditions for the position and orientation of the vertical target boards:

- Rotated by an angle of $45^\circ +10^\circ/-5^\circ$ around the vertical axis.
- Offset of $0 \pm 100\text{mm}$ in X and Y axes relative to the rectangle center point of the 1m x 1.2m zone.

The nominal positions of the 4 vertical target boards within the calibration area are illustrated in Figure 5.

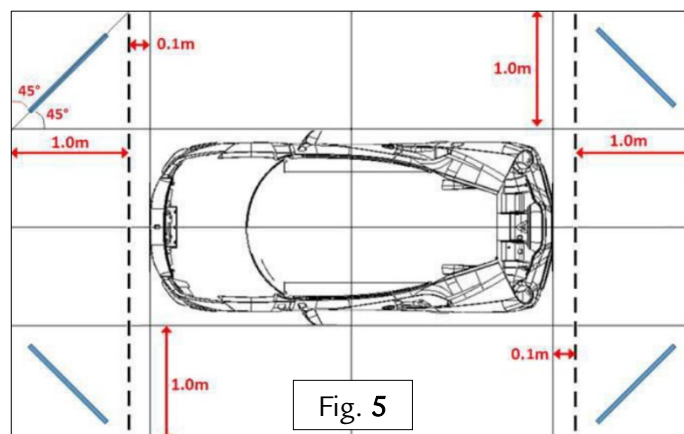


Fig. 5



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The X and Y axes for positioning the boards on the floor of the calibration area are illustrated in Figure 6.

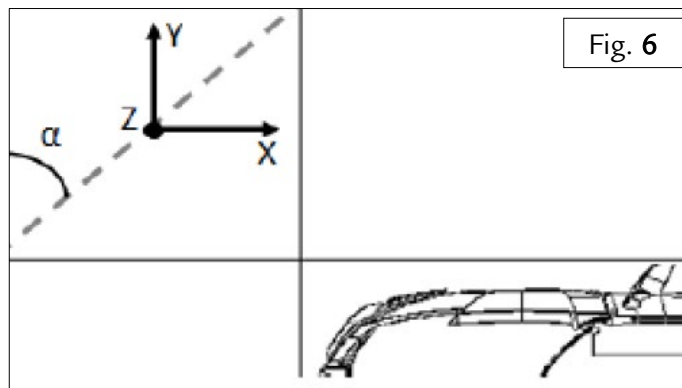


Fig. 6

The following conditions must also be met when positioning the vertical target boards in the calibration area:

- Panel in vertical position (angle of $90^\circ \pm 5\%$) relative to surface on which vehicle is standing.
NOTE: Each vertical target board is equipped with a level for measuring deviation up to approximately 1° .
- Place each board with the center point “C” at a height of $500 \pm 10\text{mm}$ relative to the rectangle center point of the respective $1.2\text{m} \times 1.0\text{m}$ zone – Fig.7.
Note: This condition is met by simply placing the vertical target boards provided on the floor of the calibration zone, without requiring to raise or lower the board relative to the vehicle.

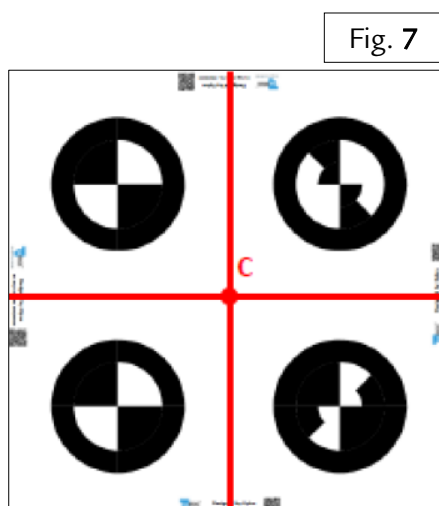
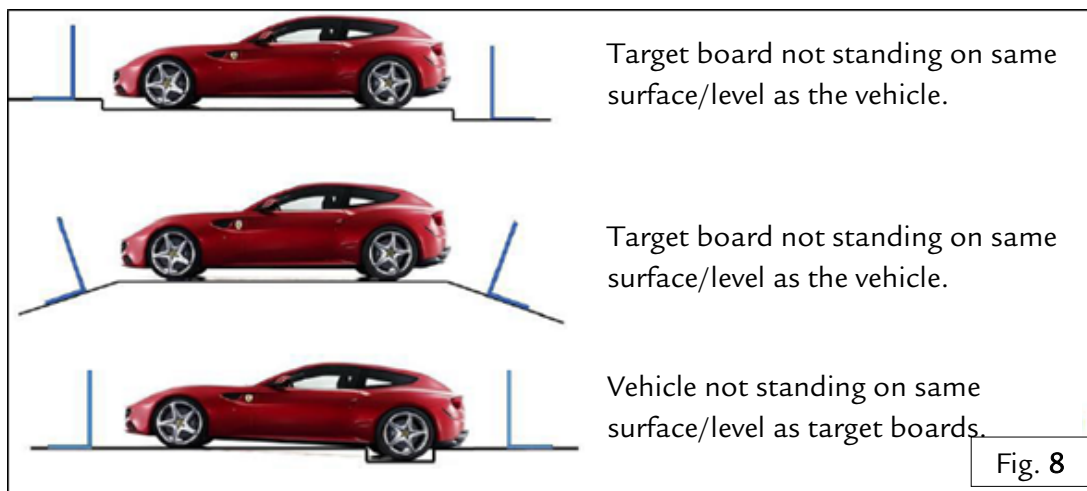


Fig. 7



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- All the vertical target boards must stand on the same surface as the vehicle being calibrated. Any of the conditions illustrated in Figure 8 are not permitted.



Calibration environment

The environment in which the **NSW** system is calibrated must meet the following conditions:

- Indoor zone with sufficient illumination (at least **500 lux** measured at center of target board)
- Indirect lighting, with no direct light beams aimed at cameras.
- Uniform lighting in calibration area.
- No glare on vertical target boards.
- No marks on surfaces of vertical target boards.

PREPARATION

Preparing the vehicle

Prepare the vehicle as follows:

- Ensure that the headlights are switched off.
- Cover the headlights.
- Cover the sides and doors of the vehicle.



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Calibration area

Make sure that there are no reflections of light sources on the floor and/or on the vehicle and/or on any objects in the surrounding area.

Cleaning the cameras

Clean the cameras as follows:

- Wipe the surface.
- Blow dust from the lens with a can of compressed air.
- Clean the lens with a solvent mix (60% acetone and 40% methanol) and a cloth.

CALIBRATION PROCEDURE

- Connect the battery conditioner to the vehicle, keeping the engine compartment lid as close to the shut position as possible. Make sure that the battery conditioner is working correctly, and then connect the DEIS diagnostic tool to the OBD port of the vehicle.
- Only one person (the technician carrying out the procedure, seated inside the vehicle) is permitted within the calibration area during the procedure.
- Switch on the instrument panel, perform the SCAN IN procedure and then switch the ignition off and on again and cancel all errors.
- Launch the “**NSW Complete Cycle**” on the DEIS tester and view the progress and results of the test on the display of the infotainment node (NIT) – Fig. 9.



Fig. 9



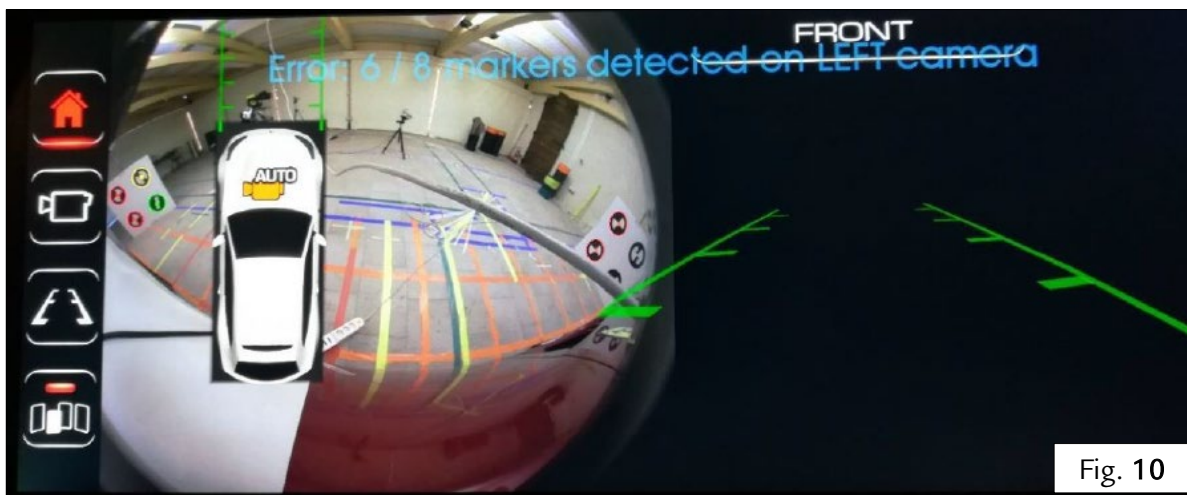
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- Once the process is launched, the system performs the calibration cycle repeatedly for a maximum time of **4 minutes**. Once the first calibration cycle is concluded successfully, the process ends with a **pass** outcome. The calibration cycle is repeated automatically in the event of a calibration error. If a cycle is not completed successfully within the maximum time limit of **4 minutes**, the calibration process ends with a **fail** outcome.

- IMPORTANT -

The conditions within the calibration area must not be altered during the calibration procedure (e.g. do not open doors/lids, fold mirrors, alter the ride height of the vehicle, obstruct the line of sight between the vehicle and the target boards etc.).

- The information shown on the display at the end of the calibration process depends on the outcome of the procedure:
 - **Calibration FAILED**
The video feed from the camera which failed to recognize 1 or more of the 8 markers is displayed on screen. The image provides information on the markers recognized by the system (circled in red, green, or yellow depending on the symbol) and the markers not recognized by the system (no circle around marker). An example of the screen displayed in the event of a **FAIL** outcome (e.g.: 2 vertical markers not recognized on right hand side) is shown in Fig.10.





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- **Calibration PASSED**

If each camera recognizes 8 markers correctly, the calibration procedure concludes successfully. The appropriate surround display mode for the selected gear appears on the infotainment system (NIT) screen, and a message confirming that the procedure has been completed successfully is shown on the DEIS tester – Fig.11.



- IMPORTANT -

All the screenshots contained in this Technical Information were accurate at the time of compilation. Actual images and screens may differ.

Thank you for your co-operation.