

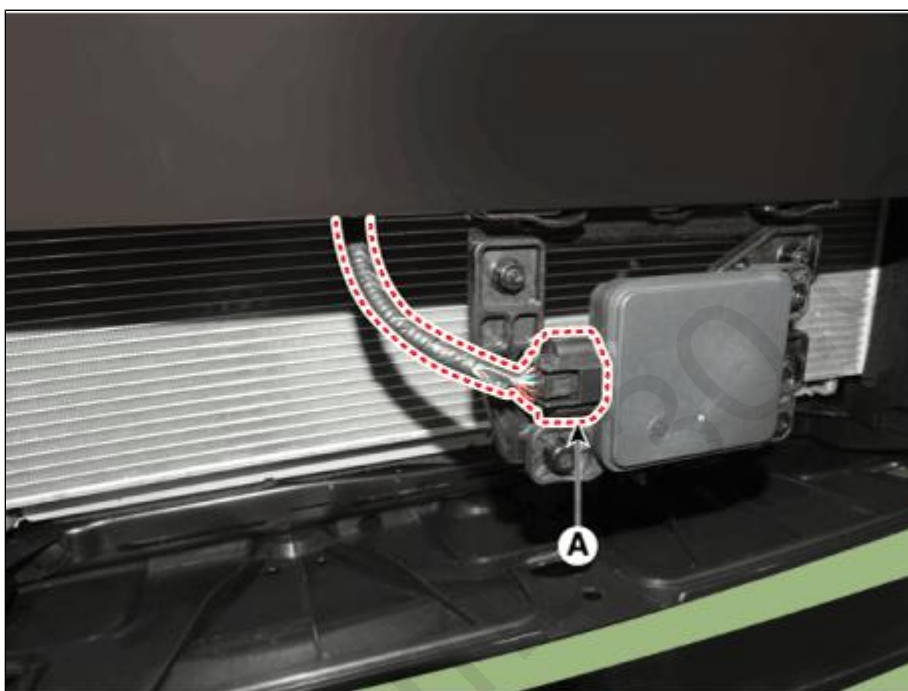
Inspection

Inspection procedure for vehicle with Forward Collision-Avoidance Assist and Smart Cruise Control system failure

1. Check the bumper appearance for accident (check the vehicle appearance visually and see bumper replacement history).
→ In case of the vehicle was involved in an accident, there is a high possibility that the FCA radar is out of the original default position.
2. Check for contamination of the radar sensor cover of the bumper.
→ If contaminated, there is a high possibility that the FCA system is deactivated during operation due to the foreign substances.
3. After turning on the engine, check the FAC warning lamp and DTC.
(Refer to the DTC diagnosis guide.)

Removal

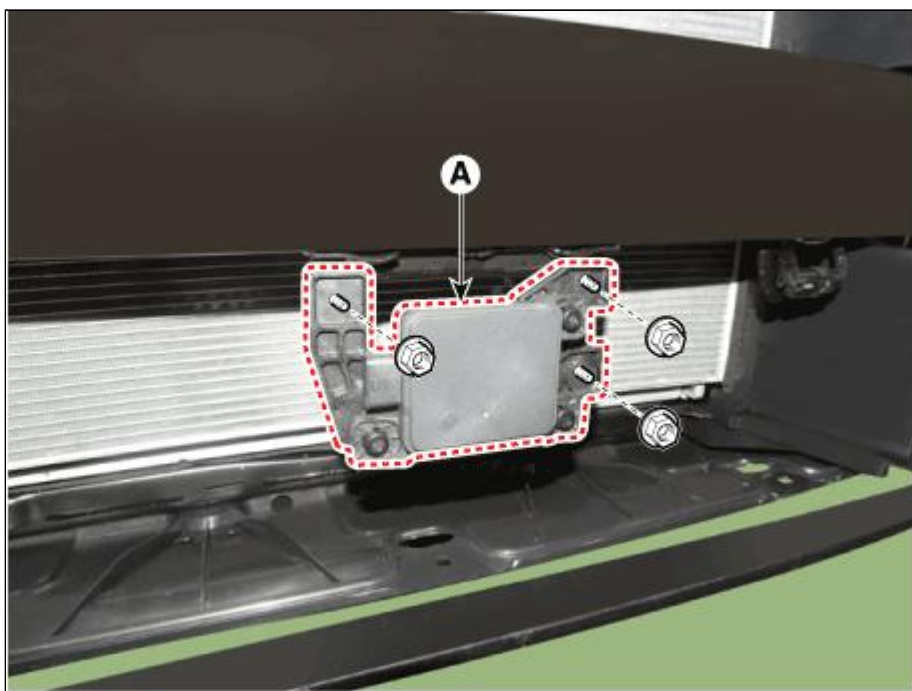
1. Turn ignition switch OFF and disconnect the negative (-) battery cable.
2. Remove the front bumper.
(Refer to Body - "Front Bumper")
3. Disconnect the front radar connector (A).



4. Remove the front radar (A) from vehicle after loosening mounting nuts.

Front radar installation nut :

9.5 - 10.5 N·m (0.97 - 1.07 kgf·m, 7.0 - 7.7 lb·ft)



Installation

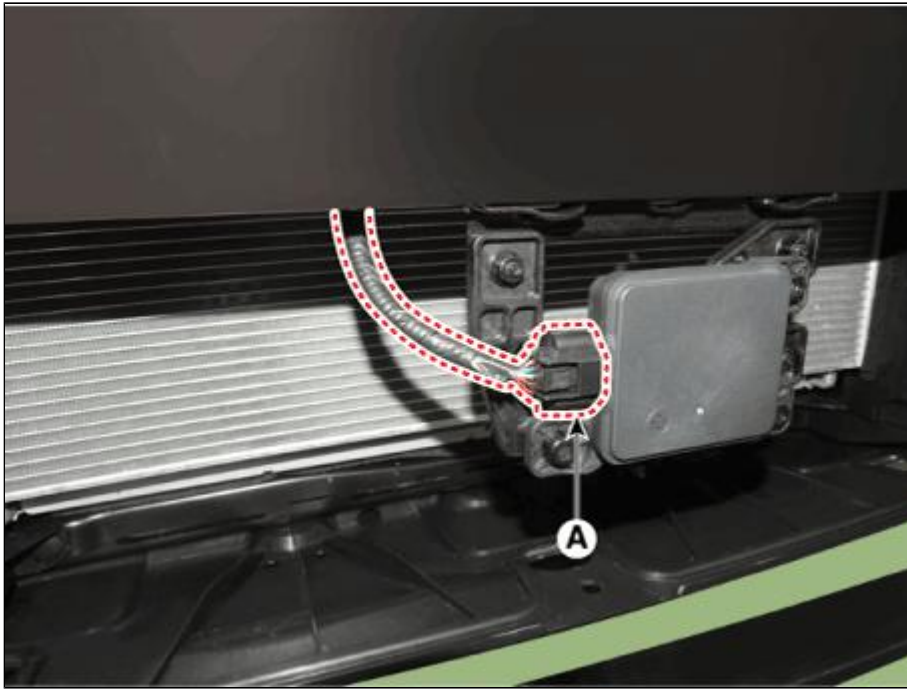
NOTICE

- Put the vehicle on the level ground.
- Take out heavy luggage from the vehicles seats or trunk.
- Set all tires according to the specified pressure.
- Check wheel alignment.
- Check that the front surface of the front radar is clean.

1. Check the last 2 digits of Lot. No (A) on label at rear side before installing the front radar.

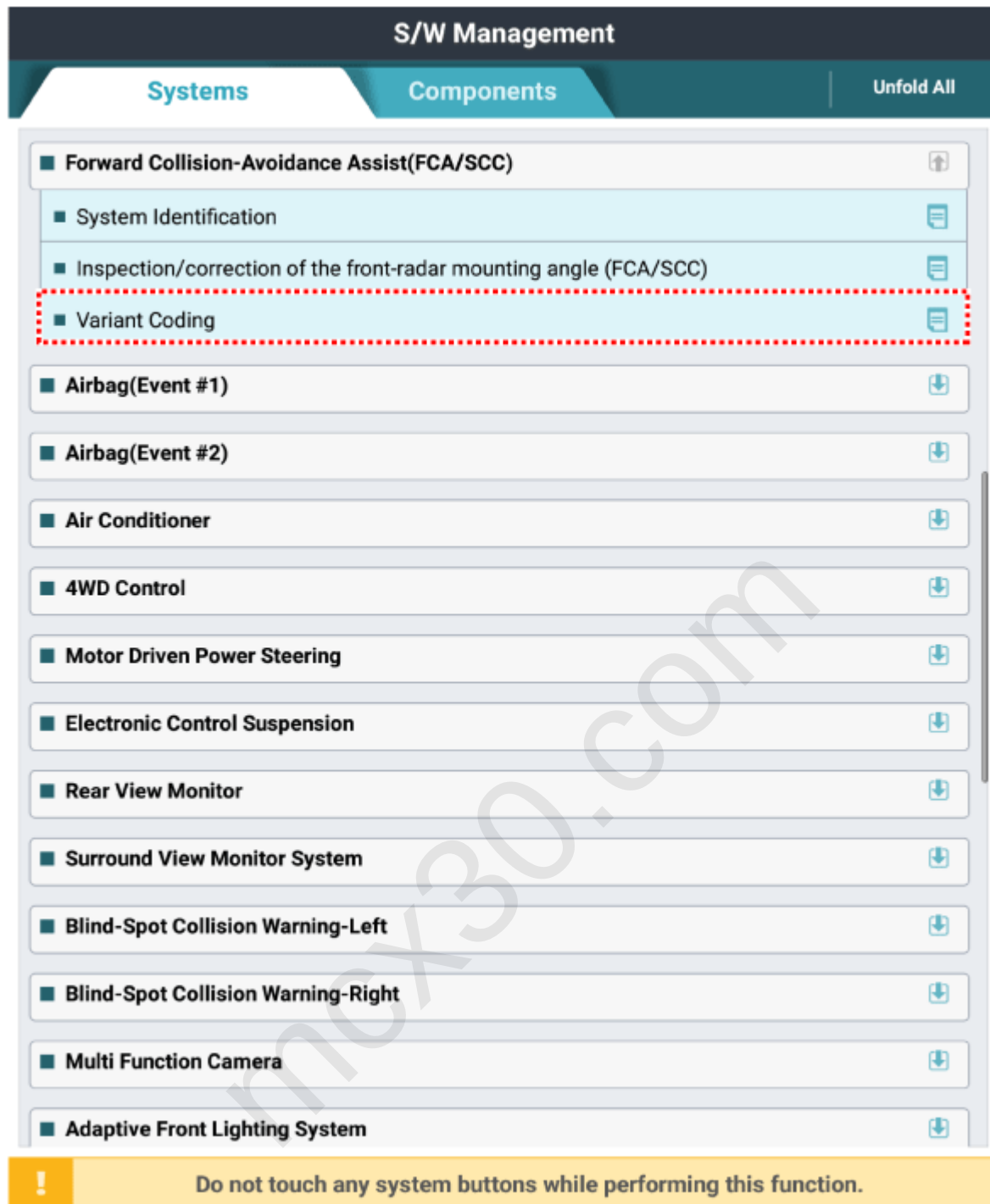
Information

The meaning of Lot. No (A) is the vertical deviation angle of front radar inner side.



4. If replaced the front radar with a new one, perform variant coding procedure by using the diagnostic tool.

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5. Check and align the front radar mounting angle.

(1) Perform the "inspection/correction of the front-radar mounting angle" using the diagnostic tool.

S/W Management

Systems

Components

Unfold All

■ Forward Collision-Avoidance Assist(FCA/SCC)

■ System Identification

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

■ Variant Coding

■ Airbag(Event #1)

■ Airbag(Event #2)

■ Air Conditioner

■ 4WD Control

■ Motor Driven Power Steering

■ Electronic Control Suspension

■ Rear View Monitor

■ Surround View Monitor System

■ Blind-Spot Collision Warning-Left

■ Blind-Spot Collision Warning-Right

■ Multi Function Camera

■ Adaptive Front Lighting System



Do not touch any system buttons while performing this function.



• Inspection/correction of the front-radar mounting angle (FCA/SCC)

Purpose	This is the function for inspecting and correcting the vehicle-mounting angle of the front radar.
Enable Condition	1. Engine stopped 2. IG ON 3. No DTC other than C1620 (alignment failed).
Concerned Component	- UNIT ASSY-FCA - UNIT ASSY-SCC - UNIT ASSY-FR RADAR
Concerned DTC	C1620
Fail Safe	Warning lamp ON
Etc	When a sensor of the front radar needs to be corrected 1. When the front radar is remounted after removal and replacement 2. When C1620 (alignment failed) DTC occurs 3. When the front radar and its vicinity are impacted by collision including minor collisions 4. When there is an error including FCA, SCC, and HDA in the detection/sensing function of the front

OK



Do not touch any system buttons while performing this function.

(2) Input 2 digits of value in the code input box, then press "OK"

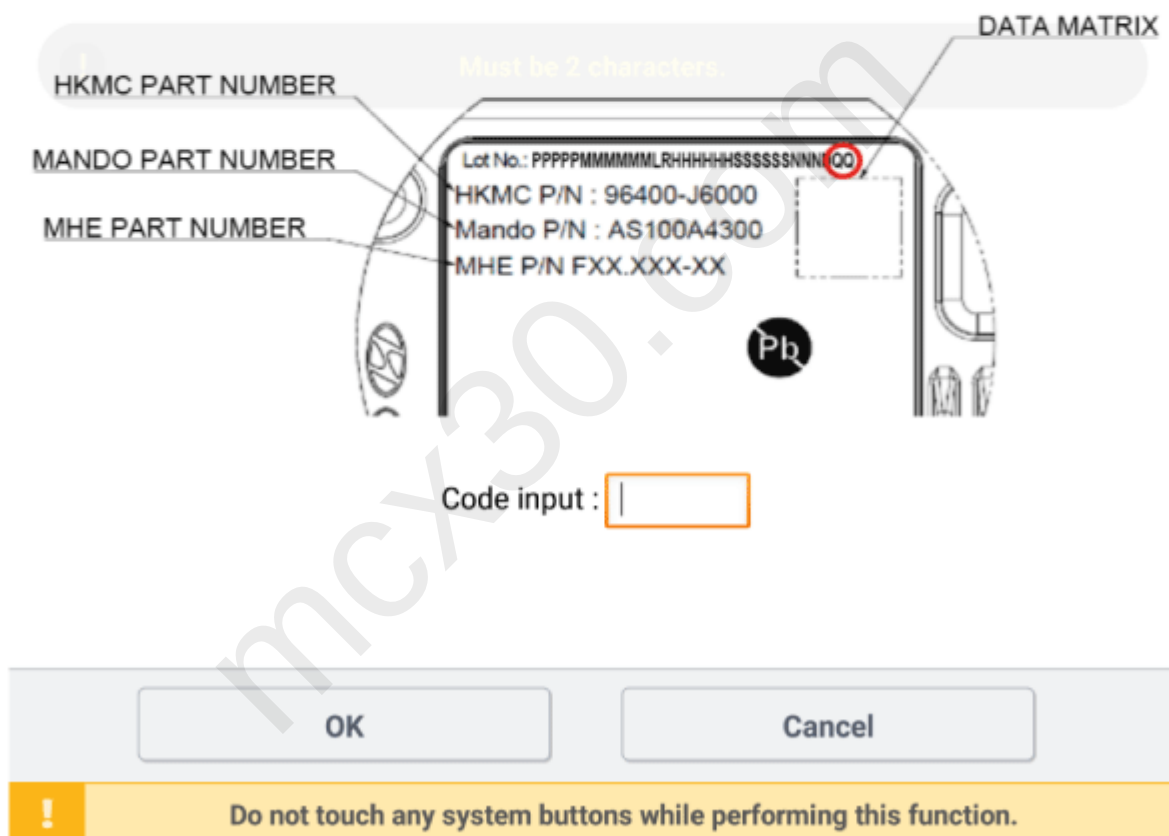
S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

[Checking of vertical error angle]

1. Check the value of the last two digits (QQ) of the lot no. marked on the label attached to the rear part of the radar.
2. Enter the value of the last two digits into the code input window, and click the **[OK]** button.



(3) Check the vertical angle which is compensated error on diagnostic tool.

i Information

The result value is final goal vertical angle which is compensated inner error of criteria vertical installation angle -1°.

S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

[Correction of the vertical error angle]

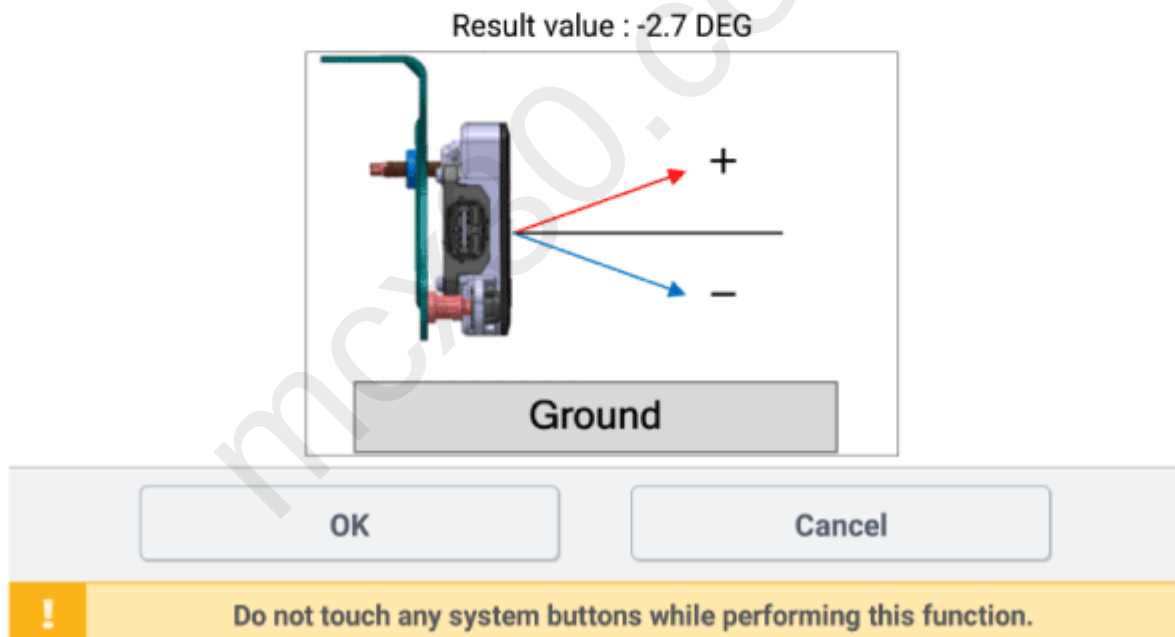
Adjust the vertical angle of the front radar so that the angle matches the result value displayed below.



* In checking the vertical angle, make sure that the electronic clinometer (verticality meter) is calibrated to zero.

Make sure that the adjustment is made in accordance with the maintenance instructions.

After the adjustment is completed, click the **[OK]** button.



(4) Check the front radar vertical angle by using the vertical protractor (tiltmeter).

NOTICE

Make sure to perform zero setting before using vertical protractor. (perform this procedure periodically)

Be careful with +/- readings when finding true vertical using vertical protractor.

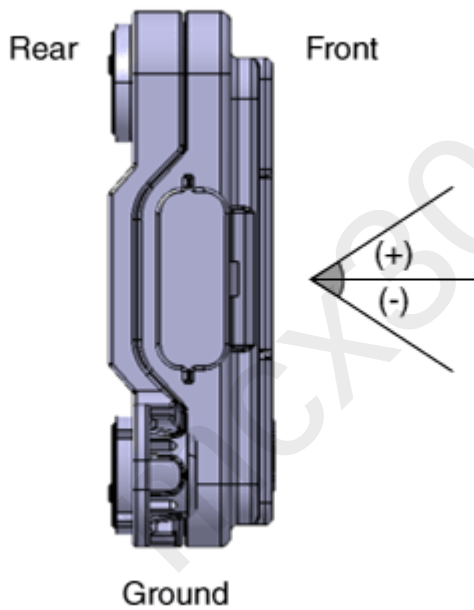
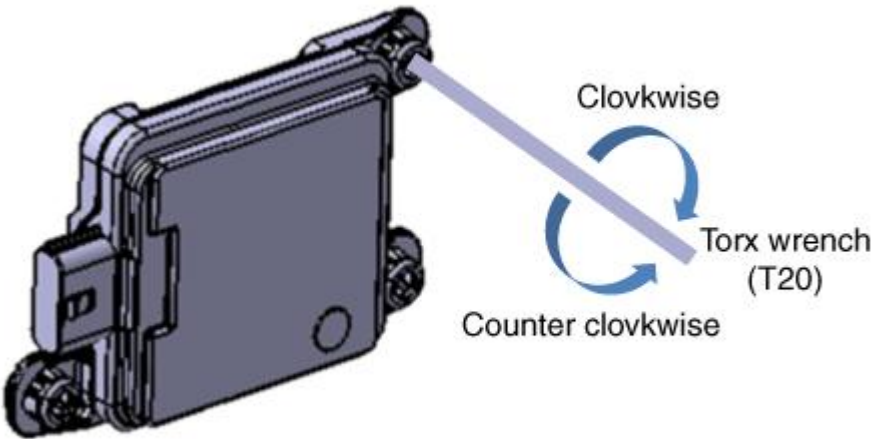
(5) Adjust to "target vertical angle" by turning adjusting screw of front radar.

turning clockwise : adjusting (+) angle

turning counterclockwise : adjusting (-) angle

NOTICE

There is a chance to be transformed of bracket if adjusting screw with over strength. Must recheck with vertical protractor if vertical angle is right after adjusting.



Number of adjustment screw rotation	Correction angle	
	Clockwise	Counter clockwise
0.5	+ 1.1°	- 1.1°
1	+ 2.2°	- 2.2°
1.5	+ 3.3°	- 3.3°

- (6) Install the front bumper assembly.
(Refer to Body - "Front Bumper Assembly")
- (7) Perform the front radar inspection/correction procedure by using the SST.
(Refer to Smart Cruise Control (Stop & Go) (SCC) Unit-Radar - "Adjustment")

Adjustment

The front radar detects control subject in front, and recognize distance from the subject, comparing speed and etc. For these reasons the direction of installation has to be on collinear with vehicle. Therefore, installing angle inspection and adjustment have to be done in case of the front radar removed and reinstalled caused by accident or install a new front radar. Accuracy of the front radar cannot be guaranteed if inspection and adjustment have not been done in case of mentioned situation before. Front radar inspection/adjustment have to be done with either stop mode (C1) or drive mode (C2) using by diagnostic tool Perform adjustment procedure with exclusive adjustment reflector (SST) for stop mode (C1).

i Information

after operating stop mode, the accuracy will be increased if the vehicle has driven more than 10 min. (drive on straight lane which has metallic reflector.)
Operate adjustment on real road driving (drive on the road that has many metallic fixed reflector such as guard rail) for drive mode. (C2)

i Information

The cases that front radar installation angle checking/adjustment are needed.

Front radar has been replaced
Front radar has been removed and reinstalled.
Line up failed DTC has been occurred
Failure on front radar detecting and cognition function
failed to detect vehicle in front while functioning
often detecting error of side lane
often detecting error even though any object is not in front

How to Check / Adjust Front Radar Installation Angle - Stop Mode

i Information

Preparation before the front radar alignment :

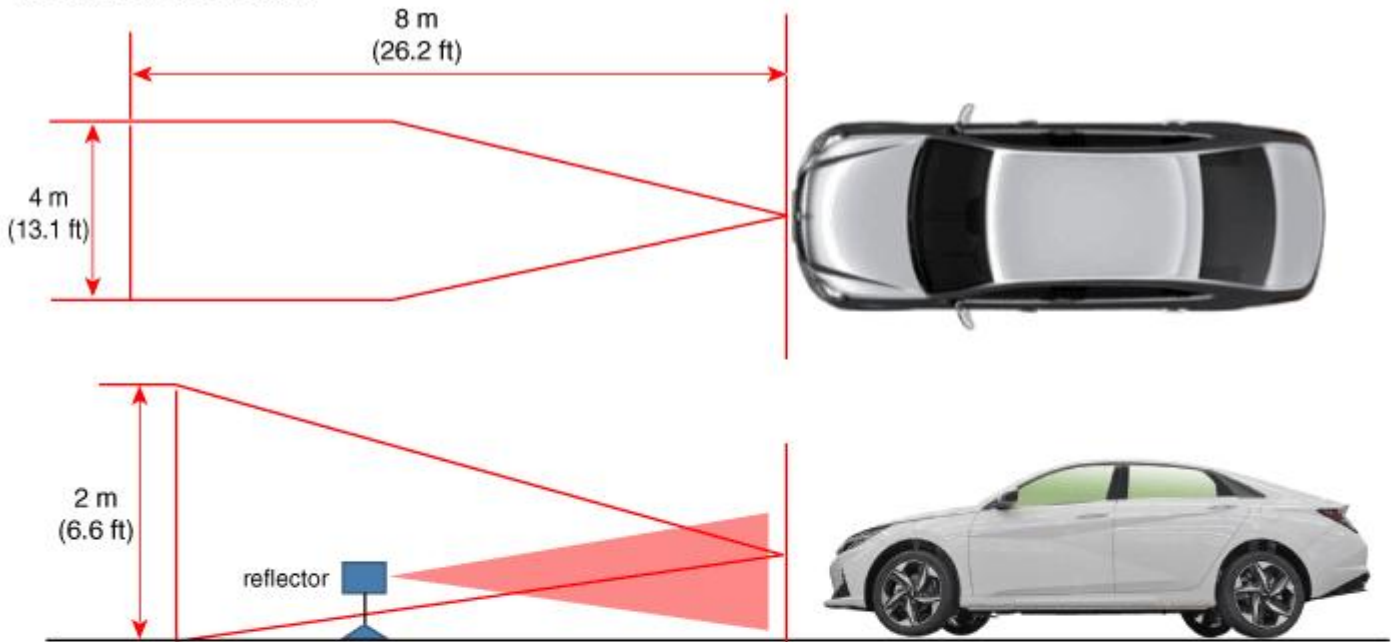
Put the vehicle on the level ground.
Take out heavy luggage from the vehicles seats or trunk.
Set all tires according to the specified pressure.
Check wheel alignment.
Check that the front surface of the front radar is clean.

NOTICE

Perform in an area with minimum clearance of 8m (26.2 ft) front, 4m (13.1 ft) sides, and 2 m (6.6 ft) above the vehicle.
Install the reflector exactly 2.5 m (8.2 ft) away from the Front Radar.
The reflector has to be installed at same place (height and angle) as front radar center.
(If height and angle are different, then adjustment can not be done correctly.)
Remove objects (metal plates, resins, etc.) that may cause electric signal interference from the area where front radar alignment is performed.
Make sure to use exclusive reflector (OK964-J5100)
Be sure that the vehicle is not moved and free from vibration when performing front radar alignment (getting in/out or opening/closing doors).
IG has to be on when performing front radar alignment. (engine stop condition)

1. Stop the vehicle horizontally at a flat place.

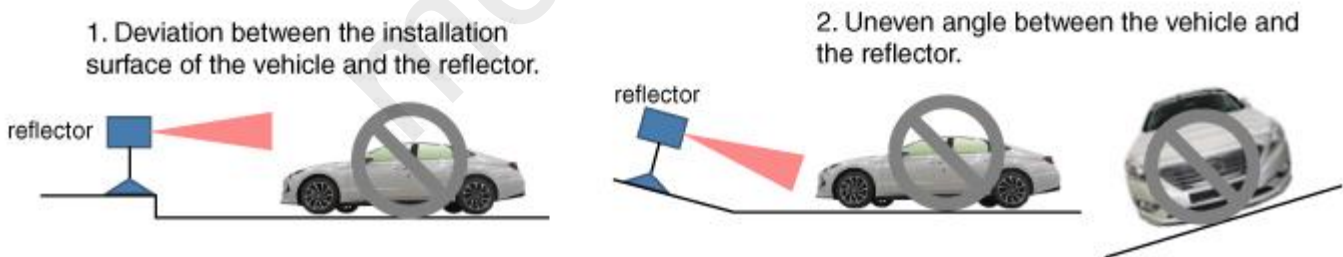
[Work Area Specification]



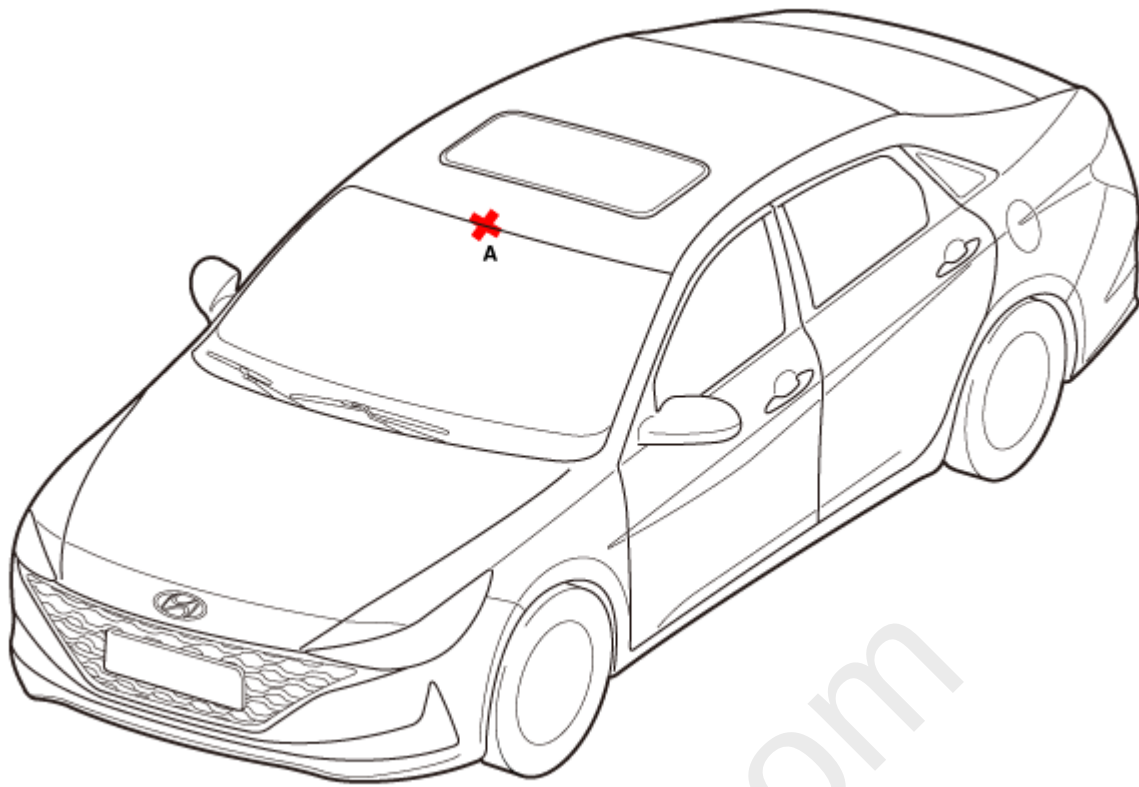
[Leveling: Installation surface of the vehicle and the reflector must be evenly levelled.]



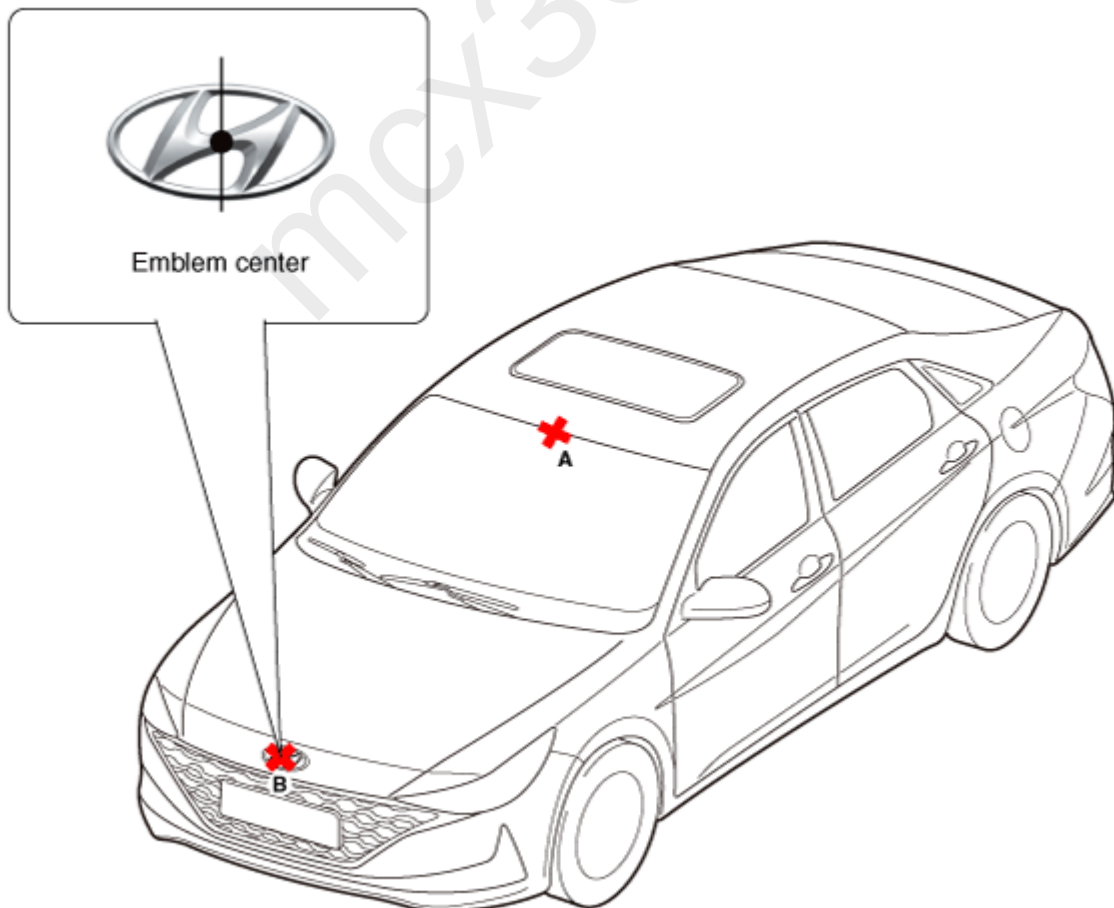
[Inappropriate Location - Example]



2. Mark the center point (A) after measuring the distance on top of wind glass.



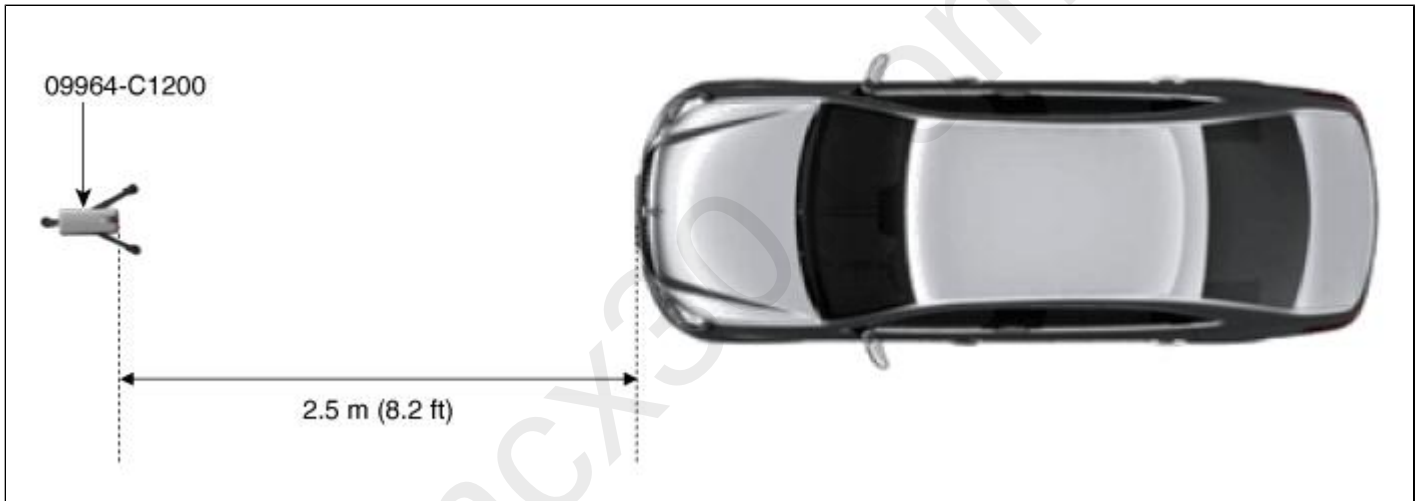
3. Mark the center point of emblem (B).



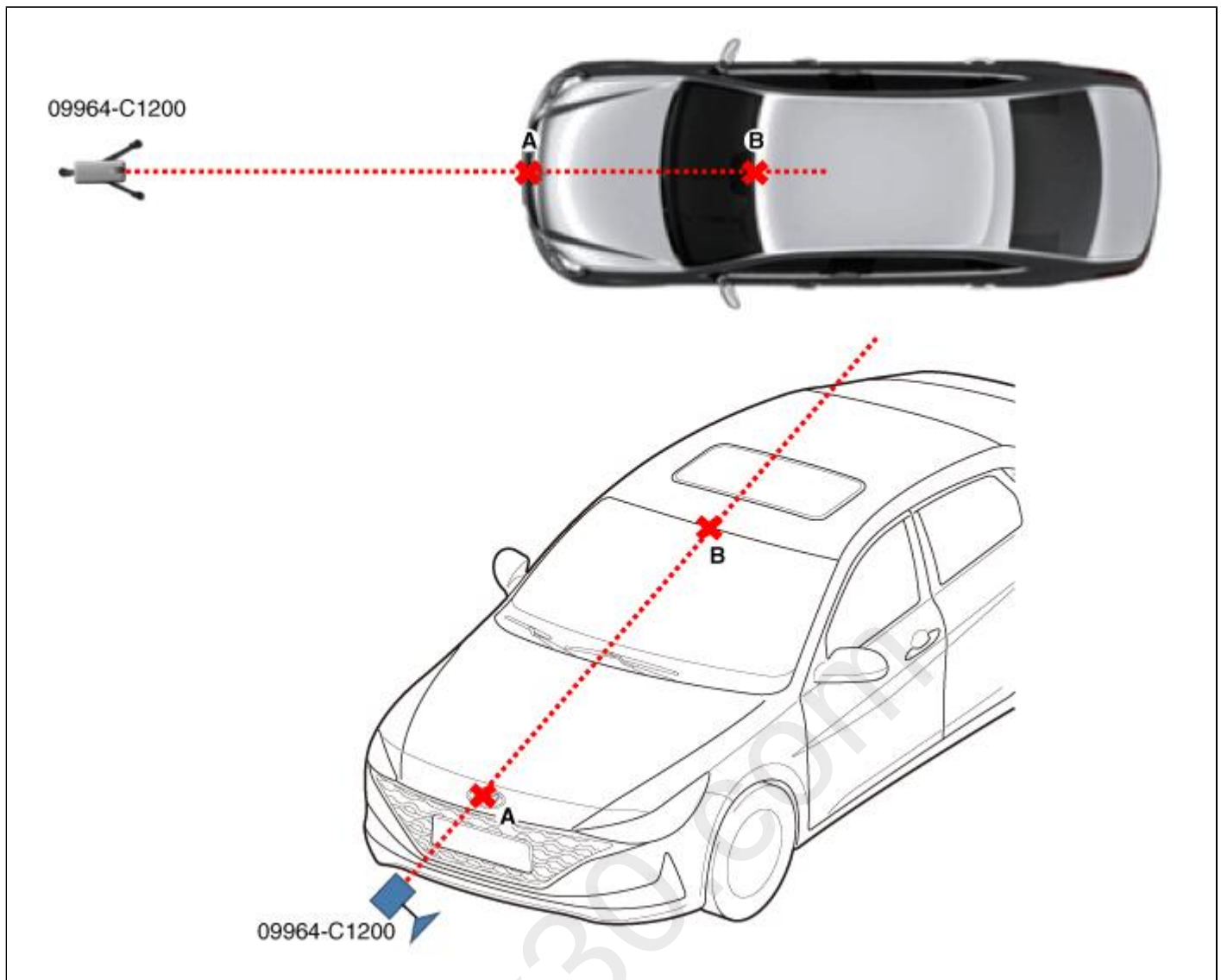
4. Install the laser (09964-C1200) to the tripod (09964-C1300).



5. Place the laser (09964-C1200) at 2.5m (8.2 ft) to the front of the vehicle.

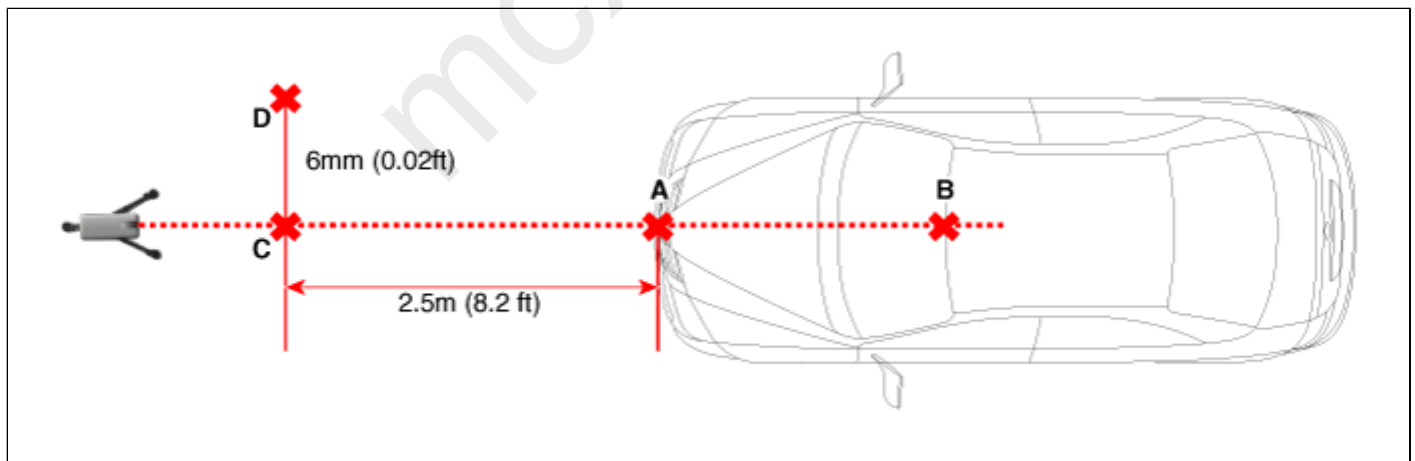


6. Match the vertical line of laser to (A) and (B) using the laser (09964-C1200).



7. Mark (C) at 2.5 m (8.2 ft) from (A) in front of the vehicle.

8. Mark (D) at the place which is 6mm away from (C) to the right in vertical direction.



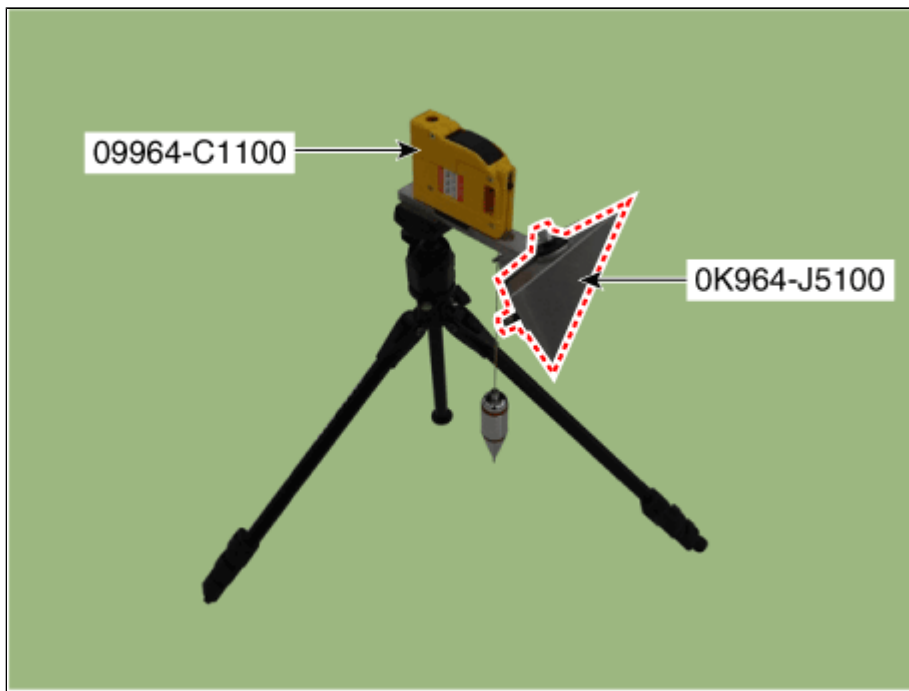
9. Remove the laser (09964-C1200) from the tripod (09964-C1300).



10. Mount the reflector (09964-C1100) onto the tripod (09964-C1300).



11. Mount the reflector adapter (0K964-J5100) to the reflector (09964-C1100).



12. Set the reflector horizontal using the leveler (A) which is built in the tripod (09964-C1300).



13. Align the vertical weight (A) of the reflector (09964-C1100) with the point (D).



14. Set the height of the reflector adapter (0K964-J5100) to 357mm (14.05 inch).



15. Remove the vertical weight from the reflector (09964-C1100).

NOTICE

It can be effected to adjustment if the vertical weight is still left.

16. Check again the front radar and the surface of front bumper for the following items with the eyes.

NOTICE

Make sure that there is no debris, or reflecting object on the surface of the radar.

Make sure that there is no debris, or reflecting object on the radiator grill.

17. Select C1 (stop mode) to inspect and adjust the front radar installation angle by following procedure on diagnostic tool screen.

S/W Management

- Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

This is the function for inspecting and correcting the vehicle-mounting angle of the front radar.

[Stop mode and driving mode]

1. Stop mode : An in-line target board or a dedicated correction reflector tool assembly is necessary.
(Item number of dedicated reflector: 0K964-J5100)
2. Driving mode : Driving on an actual road is necessary. (Straight road with consecutive metallic reflectors such as guard rails)

[Setting mode]

[C1] : Stop mode
[C2] : Driving mode

* It is recommended to proceed with the stop mode first.
After carrying out the stop-mode operation, the calibration precision of the front radar will be improved when the vehicle is driven for a certain time (minimum of 10 minutes) at no less than 40 Mile/h.

C1

C2

Cancel

 Do not touch any system buttons while performing this function.

S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

[Stop mode]

1. Make sure that open space exists in front of the vehicle.
(Minimum space to be secured: 8-m front, 4-m width, and 2-m height from the front bumper)
2. Install the reflector exactly at 2.5 m away from the front radar.
3. Install the reflector so that its left, right, upper, and lower center positions match the center of the front radar in accordance with its installation position.
4. Remount the front bumper before carrying out inspection/correction.
- Fasten the hardware to affix the bumper at the correct position.



* In installing the reflector, make sure to refer to the maintenance instructions with regard to the precautions and the installation method.

If the position of the reflector is incorrect, or if a dedicated reflector (0K964-J5100) is not used, it may lead to serious functionality problems due to improper correction even after the correction is completed.

When you are ready, click the **[OK]** button.

OK

Cancel



Do not touch any system buttons while performing this function.

S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

Alignment completed!!

Measured vertical angle : 0.10 DEG

Measured horizontal angle : 0.20 DEG

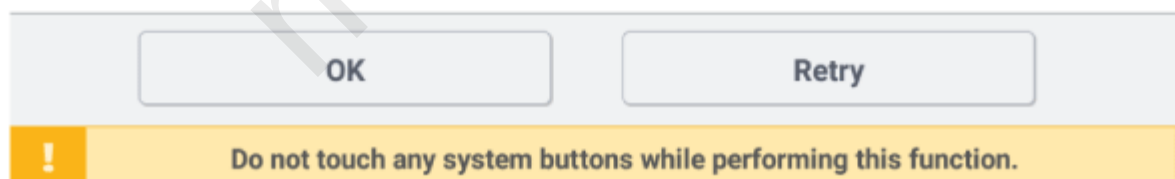
1.Criteria for the normal condition

- Range of vertical angle : -2 ~ 0 (DEG)
- Range of horizontal angle : -2 ~ +2 (DEG)

2. Operation sequence

- When the criteria for the normal condition are met, click the **[OK]** button.
- When the criteria for the normal condition are NOT met, click the **[Retry]** button.

* When the criteria for the normal condition are met, it is recommended to improve the radar precision by driving the vehicle for a minimum of 10 minutes at no less than 40 Mile/h.



How to Check / Adjust Front Radar Installation Angle - Drive Mode

Information

After operating stop mode, the accuracy will be increased if the vehicle has driven more than 10 min. (drive on straight lane which has metallic reflector.)

If stop mode operation can not be done, then use drive mode to proceed front radar adjusting procedure.

NOTICE

Preparation before the front radar alignment :

- Put the vehicle on the level ground.
- Take out heavy luggage from the vehicles seats or trunk.

Set all tires according to the specified pressure.
Check wheel alignment.
Check that the front surface of the front radar is clean.

1. Select C2 (drive mode) to inspect and adjust the front radar installation angle by following procedure on diagnostic tool screen.

S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

This is the function for inspecting and correcting the vehicle-mounting angle of the front radar.

[Stop mode and driving mode]
1. Stop mode : An in-line target board or a dedicated correction reflector tool assembly is necessary.
(Item number of dedicated reflector: 0K964-J5100)
2. Driving mode : Driving on an actual road is necessary. (Straight road with consecutive metallic reflectors such as guard rails)

[Setting mode]
[C1] : Stop mode
[C2] : Driving mode

* It is recommended to proceed with the stop mode first.
After carrying out the stop-mode operation, the calibration precision of the front radar will be improved when the vehicle is driven for a certain time (minimum of 10 minutes) at no less than 40 Mile/h.

C1C2Cancel

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

S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

[Driving mode]

1. Before carrying out the driving-mode correction, remount the bumper.
 - Carry out this operation under the normal condition after checking the assembly condition as well as for contamination, damages, deformation, etc. of the front bumper and the cover of the front radar.
2. After starting the engine, carry out the driving-mode correction with the diagnostic equipment.
3. Check whether any FCA and SCC warning messages are displayed (or warning lamps are turned on) on the cluster.
4. Drive the vehicle at no less than 40 Mile/h until the FCA and SCC warning messages are cleared (or the warning lamps are turned off).
 - Although the driving-mode correction typically takes approximately 5 to 15 minutes, it may vary depending on the road and driving conditions.
 - Make sure to keep the engine running until the correction is completed (warning lamps are turned off).
 - If the engine stops or the IG is OFF, carry out the driving-mode again.

* Factors that suspend or delay sensor alignment

- Excessive steering and lane change
- Driving at a speed lower than the required speed or stopping condition (including stopping at traffic signs)

OK

Cancel



Do not touch any system buttons while performing this function.

S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

Start the driving-mode sensor alignment.

When the vehicle can be driven with the diagnostic equipment installed, click the **[OK]** button, and drive the vehicle at no less than 40 Mile/h until the "driving-mode alignment progress" becomes 100%.

When the vehicle can NOT be driven with the diagnostic equipment installed, click the **[EXIT]** button, and drive the vehicle until FCA and SCC warning lamps are turned off.

OK

Exit



Do not touch any system buttons while performing this function.

S/W Management

■ Inspection/correction of the front-radar mounting angle (FCA/SCC)

● [Inspection/correction of the front-radar mounting angle (FCA/SCC)]

⚠️ [주의]

Pay attention to safety while driving.

Drive the vehicle at no less than 40 Mile/h until the "driving-mode alignment progress" becomes 100%.

Driving-mode alignment progress : 99 %

Exit



Do not touch any system buttons while performing this function.

2. In case of front radar inspection/correction failure, check the inspection/correction conditions.

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☐ Document Rating :

Please rate the above contents on a scale of 1 to 5.

Little Value

1

2

3

4

5

Excellent Value

