

Blind Spot Detection System

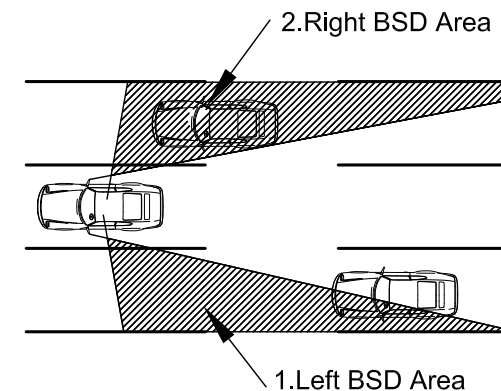
Owner's Guide

WARNING

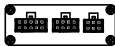
To help prevent injuries, never use the Blind Spot Detection System as a replacement for checking the interior and exterior mirrors and looking over your shoulder before changing lanes. The Blind Spot Detection System is not a replacement for careful driving.

1.System overview

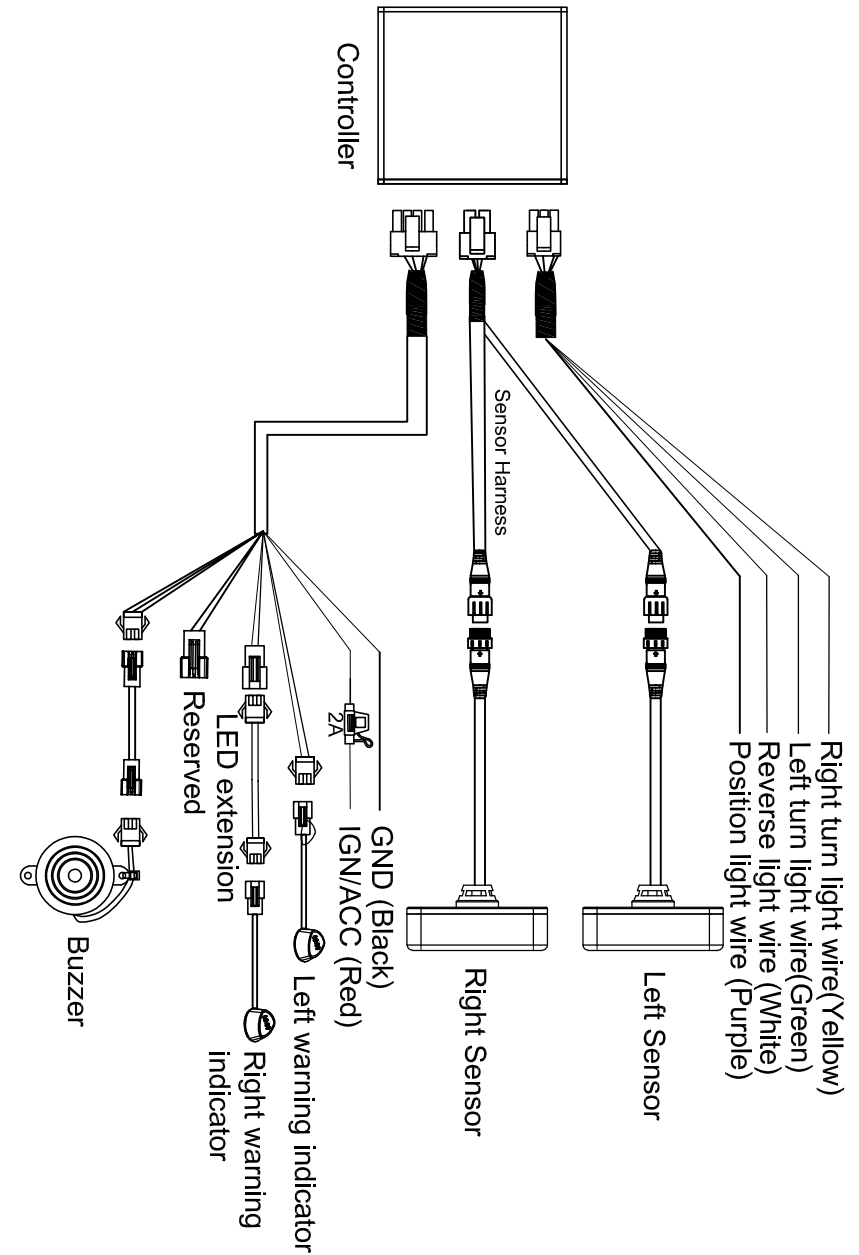
This millimeter wave blind spot system has blind spot monitoring function (BSD), lane change assist function (LCA), and Rear cross traffic alert function (RCTA). The millimeter wave radars are installed at the corners of the rear bumper and detect vehicles, bicycles, pedestrians and etc. in the detection area by emitting millimeter waves. When vehicles and other objects appear in the coverage area and meet the alarm conditions, the system will provide audible and visible warnings.



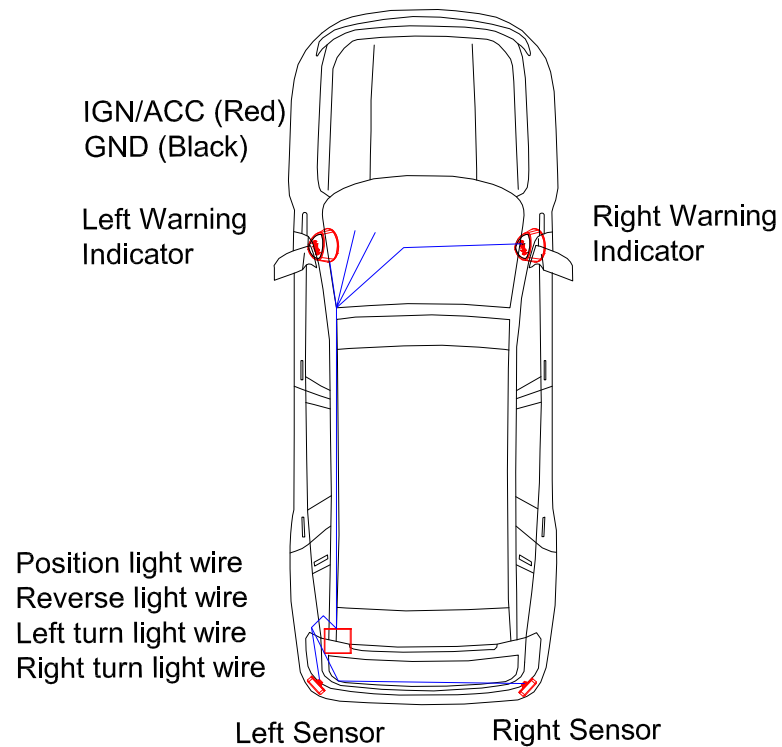
2.Kit Contents

NO.	Item	QTY.	Image
1	BSD Sensor	2	
2	Sensor Bracket	2	
3	LED Indicator	2	
4	LED Extension	1	
5	Controller	1	
6	Buzzer	1	
7	Input Harness	1	
8	Main Harness	1	
9	Adapter cable	1	
10	Sensor Harness	1	
11	Sensor Alignment Tool	1	
12	Installation Hardware Kit	1	
13	Owner's Guide	1	

3. Harness Layout



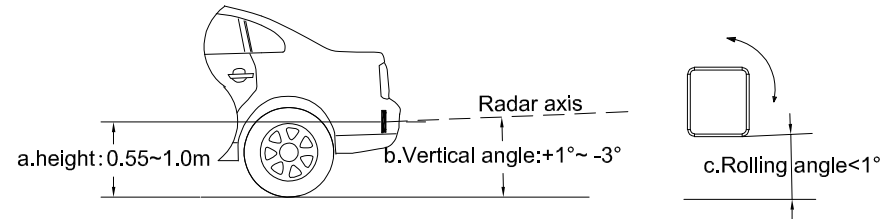
4. System Layout



5. Installation

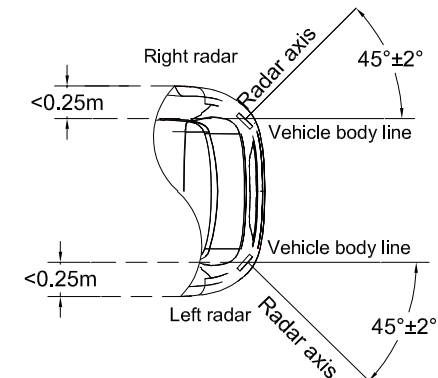
5.1. Sensor Installation

5.1.1 Sensor installation height and vertical angle requirement:



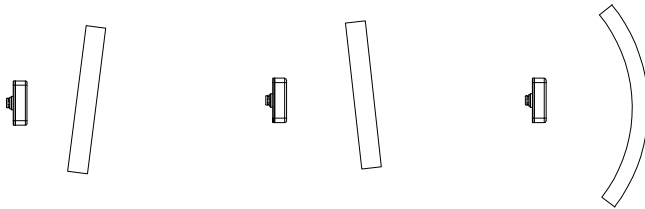
- Radar installation height range: 0.5m-1.0m;
- Vertical installation angle range: +1°~ -3° ("+" indicates upward; "-" indicates downward);
- The radar should be installed parallel to the ground, and the angle deviation should be less than 1°.

5.1.2 Sensor horizontal installation angle requirement:

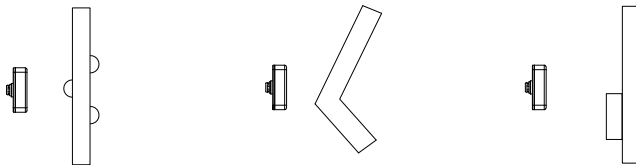


5.1.3 Requirements for the bumper at the installation position

a.Applicable bumper types as below:



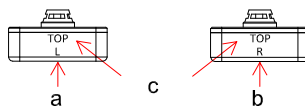
b.Not applicable bumper types as below:



c.Besides the bumper (applicable bumper materials: PC, PP, ABS, etc.), there should be no obstructions in front of the radar.

d.Make sure the bumper is not painted by metal paintings.

5.1.4 Requirements for sensor and bracket installation direction



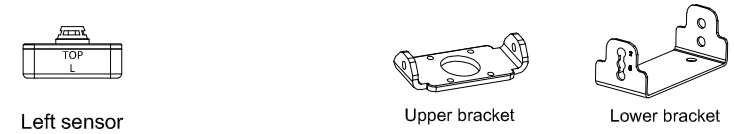
a.Left Radar marked with "L" should be installed at the left side of the vehicle;

b.Right Radar marked with "R" should be installed at the right side of the vehicle;

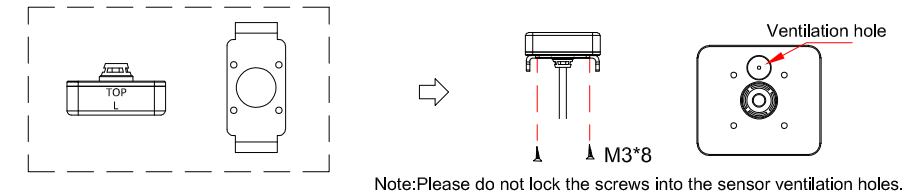
c.Direction mark "Top" on the sensor should face upward.

5.1.5 Installation procedures on passenger car

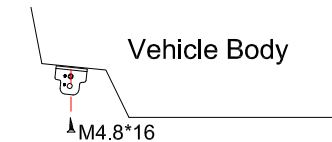
a.Choose left sensor and sensor bracket ;



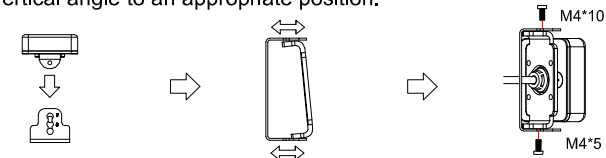
b.Assemble the sensor and upper bracket;



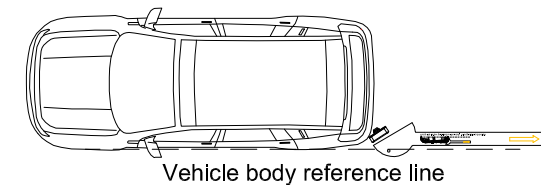
c.Fasten the lower bracket to the left side of the vehicle using M4.8×16 screws.



d.Assemble the upper bracket with the lower bracket and fasten them using M4×5 screws,and adjust the radar's vertical angle to an appropriate position.



e.Extend a straight line along the front and rear wheels of the vehicle toward the rear as the body reference line, and use the angle alignment tool to adjust the horizontal installation angle of the sensor. When the angle alignment tool is parallel to the vehicle body reference line, tighten the screws of the sensor.



f. Repeat the step b to e to fix the right sensor.

6. Function description

6.1 Self-diagnosis

After the key is turned to "on", the system will carry out self-diagnosis function and remind the driver of the system working status.

- (1) If the self-diagnosis pass, the left and right warning indicator will be on for 1s, buzzer beeps once;
- (2) If the left sensor self-diagnosis fail, the left warning indicator will blinker for 5 times in 1s, buzzer beeps twice;
- (2) If the right sensor self-diagnosis fail, the right warning indicator will blinker for 5 times in 1s, buzzer beeps twice;

If self-diagnosis failed, the system will not work.

6.2 Basic function

6.2.1 BSD and LCA function

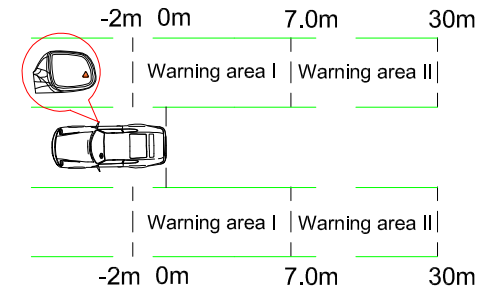
- (1) Working Condition:
 - a. The ignition is turned to "on" ;
 - b. The vehicle reverse gear is not engaged in;
- (2) Warning principle:
 - a. Warning area I (BSD)

When the subject vehicle speed $V_{\text{vehicle}} < 20\text{km/h}$, and there's target vehicle approaching, and $\text{TTC} \leq 2\text{s}$, the warning will be triggered;

When the subject vehicle speed $> 20\text{km/h}$, and there's target vehicle approaching or driving away, the warning will be triggered.
 - b. Warning area II (LCA)

When the subject vehicle speed $V_{\text{vehicle}} < 20\text{km/h}$, and there's target vehicle approaching, and $\text{TTC} \leq 2\text{s}$, the warning will be triggered;

When the subject vehicle speed $> 20\text{km/h}$, and there's target vehicle approaching and the $\text{TTC} \leq 3.0\text{s}$, the warning will be triggered.



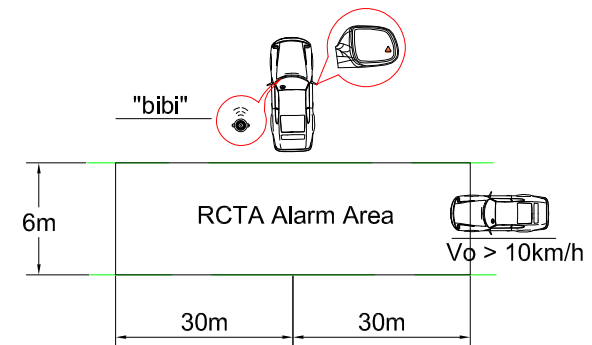
6.2.2 RCTA function

(1) Startup conditions:

- A. The ignition is turned to "on";
- B. Reverse gear is engaged;
- C. Subject vehicle speed $< 5\text{km/h}$;
- D. Object vehicle speed $> 10\text{km/h}$;
- E. Object vehicle $\text{TTC} \leq 2.0\text{s}$.

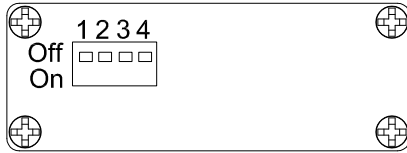
(2) Basic functions:

When reversing, the radar sensor monitors the incoming vehicles on both sides behind the vehicle to warn the driver with visible and audible alarm:



7. System Setting

The system can set the parameters via dip switch on the ECU



Dip switch No.	Switch status	Definition
1	Off	Beep 3 times when there's warning
	On	Beep 5 times when there's warning
2	Off	System start working speed: 0km/h
	On	System start working speed: 20km/h
3	Off	LCA prewarning time (TTC): 3s RCTA prewarning time (TTC): 2s
	On	LCA prewarning time (TTC): 2s RCTA prewarning time (TTC): 1.5s
4	Off	BSD Max. warning distance: 7.0m
	On	BSD Max. warning distance: 10.0m

8. System Limitations

8.1 The system may provide false alert in the following situations:

- When the lane is too narrow, the system may provide alert from third lane vehicles;
- When the vehicle is turning and there is a following or rapidly crossing vehicle directly behind, the system may provide a false alert;
- When the vehicle brakes suddenly, due to the GPS signal delay, the system may provide false alert;
- When the vehicle passes through narrow streets, the system may provide false alert;
- When the vehicle is parked next to a guardrail, the system may provide false alert to oncoming vehicles on the other side of the guardrail;
- When the horizontal or vertical installation angle deviation of the sensor is too large, the system may provide false alert;

8.2 The system may miss the alert in the following situations:

- When the radar is obstructed by foreign objects (such as ice, snow, soil, etc.), the system may miss the alert;
- When the lateral distance between the target vehicle and the subject vehicle is too close, the system may miss the alert;
- When the target vehicle speed is too fast, the system may miss the alert;
- When the horizontal or vertical installation angle deviation of the sensor is too large, the system may miss the alert;