

**FELIO
ELECTRONICS**

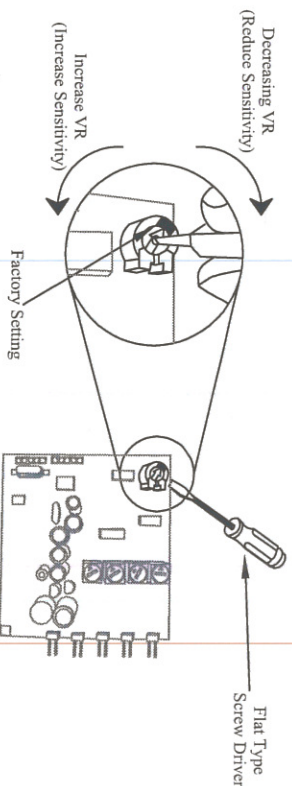
**PART NUMBER
08-01-01-315-0**

REAR VPC PASSIVE SENSOR

**PARKING SENSOR
INSTALLATION AND
OWNER MANUAL**

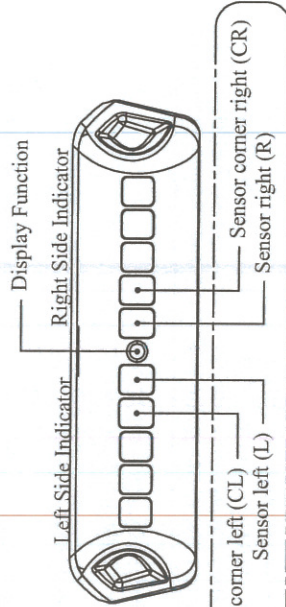
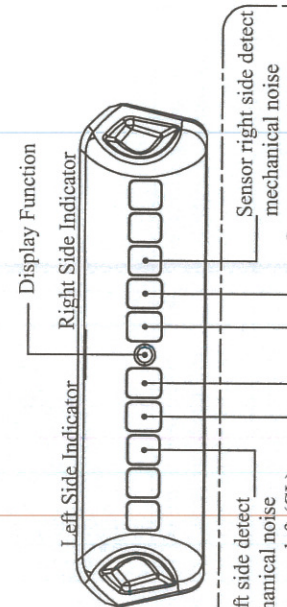
Symptom	Possible Causes	Checking Procedure / Solution
9. Sensor detection distance small. Cannot detect object (Ø75mm round tube) within specified area.	A. Low sensitivity on control unit setting.	a. Place an object distance 70cm away from sensor. b. Verify by increasing the VR setting 10° anti clockwise (5kΩ increase from factory setting). <i>* Please refer to VR Setting Tuning Instruction.</i>

VR SETTING TUNING INSTRUCTION



⚠ Apply the setting require full skill of technical on the product function.

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Symptom	Possible Causes	Checking Procedure / Solution
6. Sensor cannot detect flat object. 7. 1 or more LED always ON at display unit.	A. Sensor disconnected / detached / faulty. B. Exchange sensor to prove the sensor is faulty.	 <p>When the LED indicator continuously lighted, the correspond sensor is abnormal which may due to sensor detached/disconnected, sensor problem or sensor wiring problem.</p>
8. 3rd LED indicator and red LED indicator always light ON at display unit.	A. Noise interruption from nearby vehicle.	 <p>When the LED indicator appear only short time, this may be caused by outside noise interruption, which the system starts to function normally again when drive away from the noise area. However if the LED indicator continuously lighted even after driving away from noise area, the correspond sensor is abnormal which may due to noise interrupted control unit.</p>

1 INTRODUCTION

Our VPC Passive Sensor utilizes the most advanced ultrasonic asymmetric sensing technology that is able to detect an extremely wide angle of 160 degrees horizontally and 60 degrees vertically to achieve a sensing distance of 1.7 meters which cannot be found in conventional parking systems.

The VPC Passive Sensor is designed to blend into all bumpers and can be color-coded to obtain the original factory fitted look. The intelligent software provides superb accuracy in detecting narrow and round objects, self-diagnostics for all the sensors at every start-up of the system. Our sophisticated Noise Reduction System prevents false alarms from rain or wind, which ultimately provides greater safety, increased comfort and maximum convenience.

VPC Passive Sensor comes with stand-alone LED Display which can be mounted on any convenient location without direct wiring to the control unit. Less wiring can reduce the vehicle weight, fuel saving and environmental friendly. This system also provides problem diagnostic solutions.

2 PRODUCT FUNCTIONS

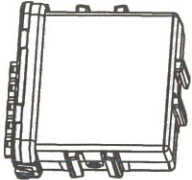



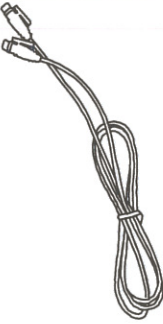




The device comes with two or four sensors and applicable for any model of vehicles, fitted at the front and rear bumper. The system will be activated when the ignition key turn to ON, indicated by full LED indicator lighted for about 1 second.

The system will start monitoring the rear condition and represented by LED indicator when there is an object within the detection area. When engage the reverse gear, the display unit will alert with buzzer tones. The progressive beeping tones and LED indicator will alert the driver of any presence of object/s and its distance to the rear of the vehicle. Upon approaching 30cm from the object, the buzzer will emit a continuous beep and indicated by full LED indicator lighted alerting the driver to stop.

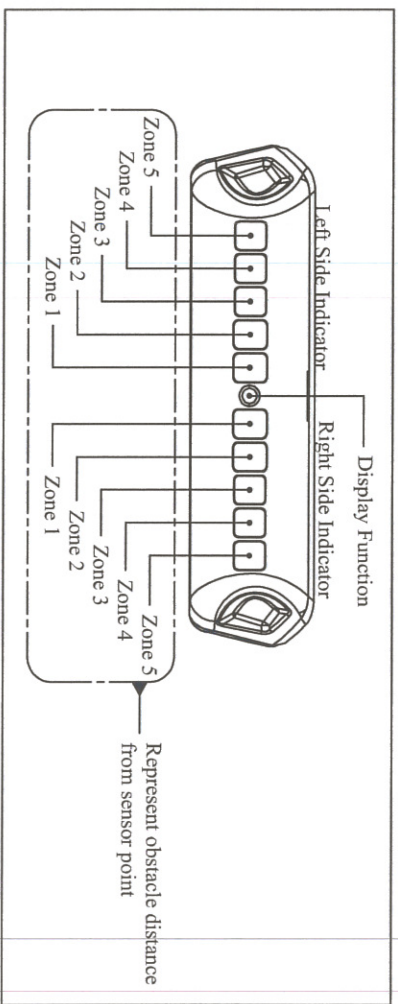
3 ELECTRICAL SPECIFICATIONS

Control Unit		Display Unit	
Characteristics	Specifications	Characteristics	Specifications
Operating Voltage	DC 10V ~ 26V	Operating Voltage	DC 10V ~ 30V
Max. Current Consumption	60mA @12VDC	Max. Current Consumption	160mA @12VDC
Operating Temperature	-30°C ~ +80°C	Operating Temperature	-30°C ~ +80°C
Operating Relative Humidity	Up to 95%	Operating Relative Humidity	Up to 95%
System Respond Time	0.12 second	Buzzer Sound Level	80dB at 10cm
-	-	Buzzer Beeping Frequency	1kHz
-	-	Standby Current	17mA @12VDC

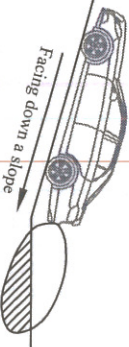
4 PARTS LISTING

Control Unit 	Display Unit 	Rear Display Cable 
Sensor Unit 	Sensor Cable 	Power Cable 
Accessories Pack 		

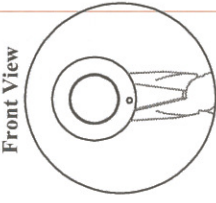
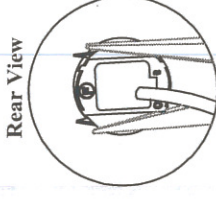
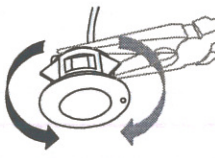

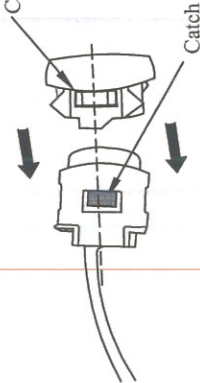
5 DISPLAY PARTS DESCRIPTION



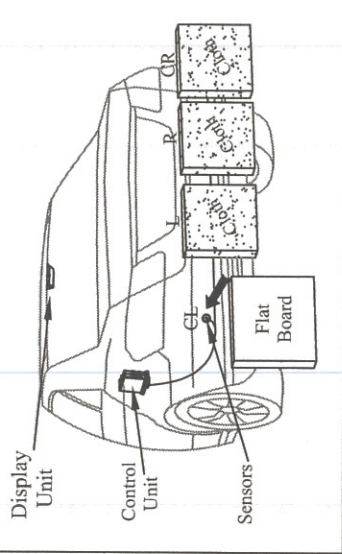
17 TROUBLESHOOTING GUIDE

Symptom	Possible Causes	Checking Procedure / Solution										
1. When ignition key turn 'ON', the display unit's Display Function LED is OFF.	A. Display unit power supply problem.	a. Ensure display cable is in good condition. b. Ensure display unit is inserted and connected properly. c. Ensure display cable wire of red (ACC) and black (GND) connect properly.										
2. When ignition key turn 'ON', the display unit's Display Function LED ON for 3 second only and then disappear (OFF).	A. Control unit power supply problem.	a. Ensure control unit cable is in good condition. b. Ensure control unit is inserted and connected properly. c. Ensure control unit cable wire of red (ACC) and black (GND) connect properly.										
3. No LED indication when an object within detection zone.	A. Power-line communication signal weak may due to noise interruption.	a. Unplug all sensors to check the power-line communication signal strength on the display unit LED indication. Follow signal strength LED indicator acceptance level.										
4. Self diagnostic (1, 2, 3, 4 beeping)	<table border="1"> <thead> <tr> <th>No. of Beeping</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1 Beep Sound</td> <td>Left Sensor Malfunction</td> </tr> <tr> <td>2 Beep Sound</td> <td>Right Sensor Malfunction</td> </tr> <tr> <td>3 Beep Sound</td> <td>Corner Left Sensor Malfunction</td> </tr> <tr> <td>4 Beep Sound</td> <td>Corner Right Sensor Malfunction</td> </tr> </tbody> </table>	No. of Beeping	Description	1 Beep Sound	Left Sensor Malfunction	2 Beep Sound	Right Sensor Malfunction	3 Beep Sound	Corner Left Sensor Malfunction	4 Beep Sound	Corner Right Sensor Malfunction	a. Check all the connection. b. Replace with new sensor. c. Reconnect sensor cable.
No. of Beeping	Description											
1 Beep Sound	Left Sensor Malfunction											
2 Beep Sound	Right Sensor Malfunction											
3 Beep Sound	Corner Left Sensor Malfunction											
4 Beep Sound	Corner Right Sensor Malfunction											
5. Always detect zone 4 or 5 without object in front of sensor.	A. Vehicle is facing slope. B. Sensor wrong orientation cause detecting ground. C. Sensor facing ground. D. Sensor mounting height below 45cm. E. Over sensitivity (sensors are detecting the ground).	a. Ensure the bumper is not facing to ground.  b. Ensure sensors are installed at the correct orientation. (refer to 12.1 Precautions for Sensor Installation) c. Ensure sensors surface not facing to ground. (refer to 12.1 Precautions for Sensor Installation) d. Ensure that sensors mounting height are as recommended as per described in 12.1.2 Sensor Installation Height. e. Verify by reducing the VR setting 10° clockwise (5KΩ reduce from factory setting). * Please refer to VR Setting Tuning Instruction.										

15 INSTRUCTION OF CHANGING SENSOR BEZEL

Dismantle Sensor Bezel	
 <p>Front View</p>	 <p>Rear View</p>
	
<p>Description</p> <p>Direction to Twist the Sensor Bezel.</p> <p>Direction to Twist the Long Nose Plier</p>	
Install Sensor Bezel	
 <p>Catch Hole</p> <p>Catch</p>	<p>Description</p> <p>Push the Bezel unto the Sensor Body</p> <p>The Catch and Catch Hole should aligned to each other.</p> <p>A "Click" sound should be heard indicating the bezel is firmly attached to the sensor body.</p>

16 OPERATION AND TESTING GUIDE

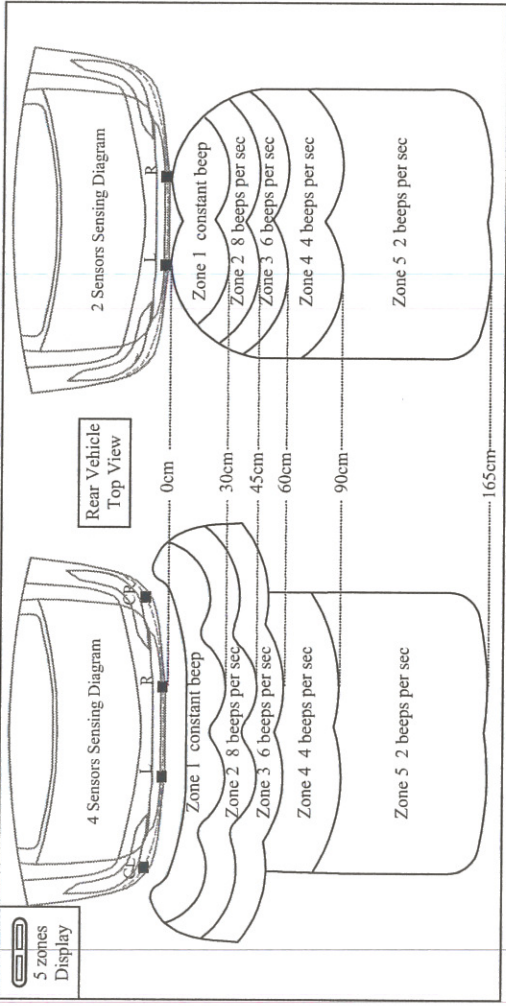
- Position your car to a empty space area. Turn ignition key to ON.
 - All LEDs on display unit light ON about 1 second, indicate system is activated and bulb check.
 - Test CL sensor by covering L, R & CR sensors with cloths.
 - Then, use an object (Flat board 30cm x 30cm) and move from far apart, towards closer to the sensor, the buzzer sound interval is shorter and LED light indicator light up according to the zoning. (Please refer to *Sensor Sensing Diagram and Display Light Indication*)
- 
- LED light indicator displayed in display unit will emit on the left-side. Ensure that the LED light indicator displays at the correct side of display unit. (*Left Hand Side for CL & L sensors, Right hand Side for R & CR sensors*)
 - Continue to check other sensors L, R & CR using same method from Step 3 to Step 5.

IMPORTANT

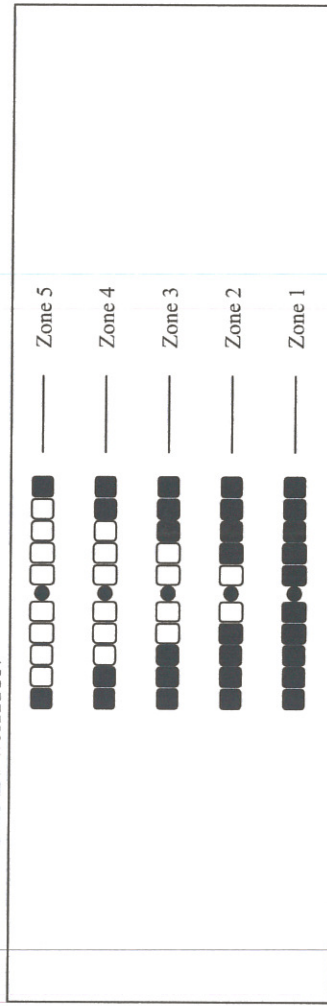
This device is designed to aid drivers during parking and negotiating tight spots. It should not be considered as a safety device for any other purpose. Proper driving techniques are always essential. The manufacturer, distributor and dealer shall not be held liable for any unforeseen accidents. Detection of humans and animals are not advisable.

Note: All specification are subject to change without priority notice.

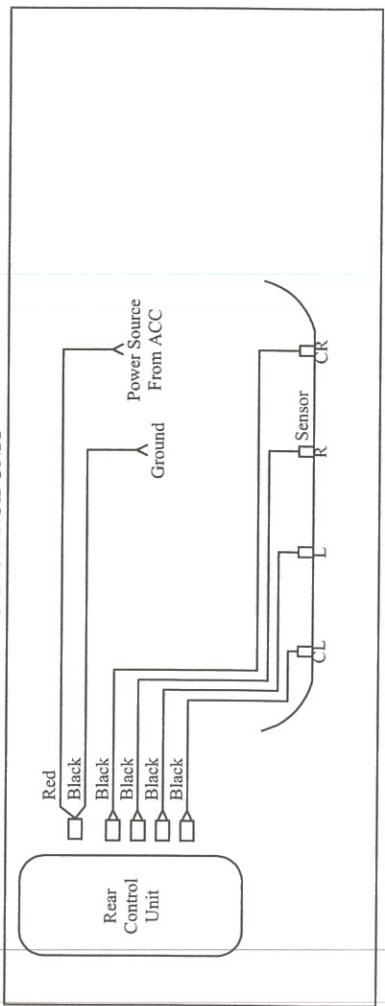
6 SENSOR SENSING DIAGRAM

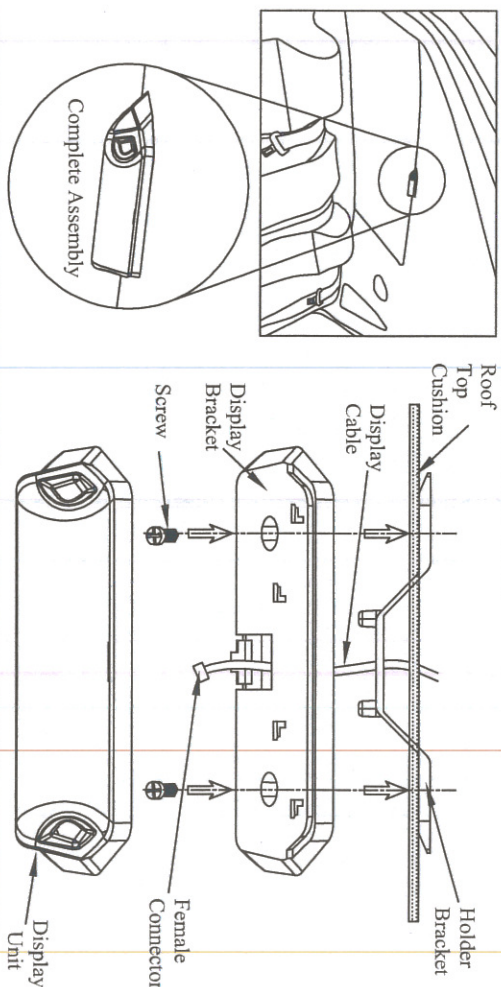
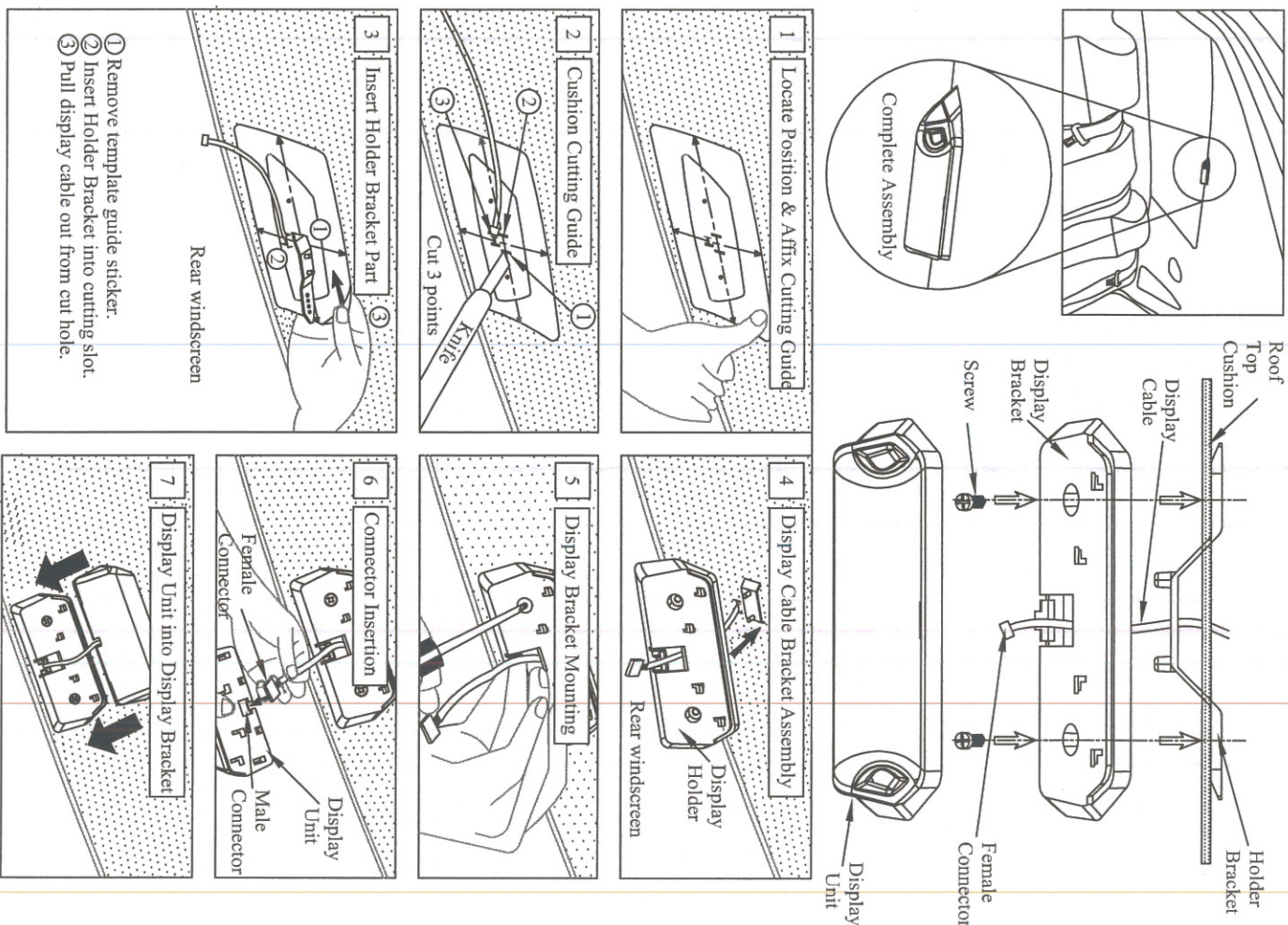
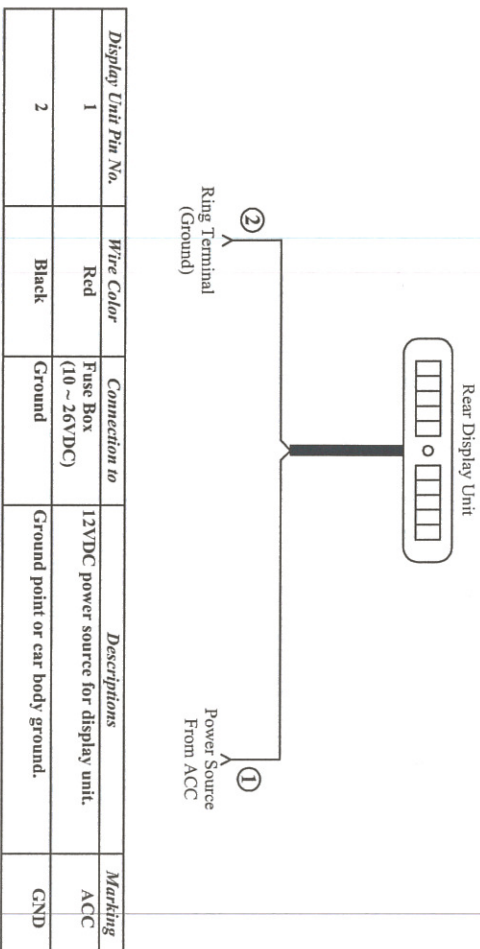


7 DISPLAY LIGHT INDICATION

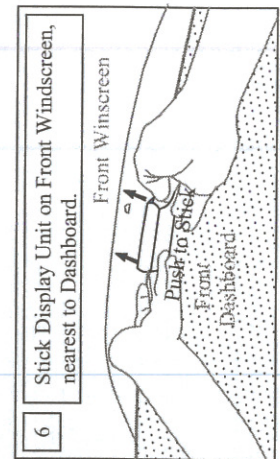
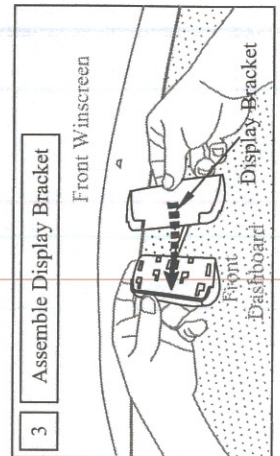
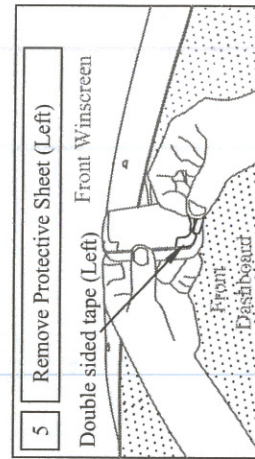
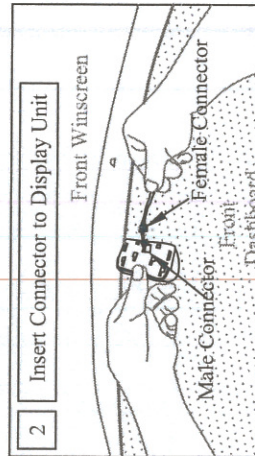
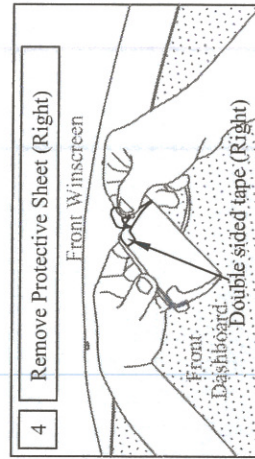
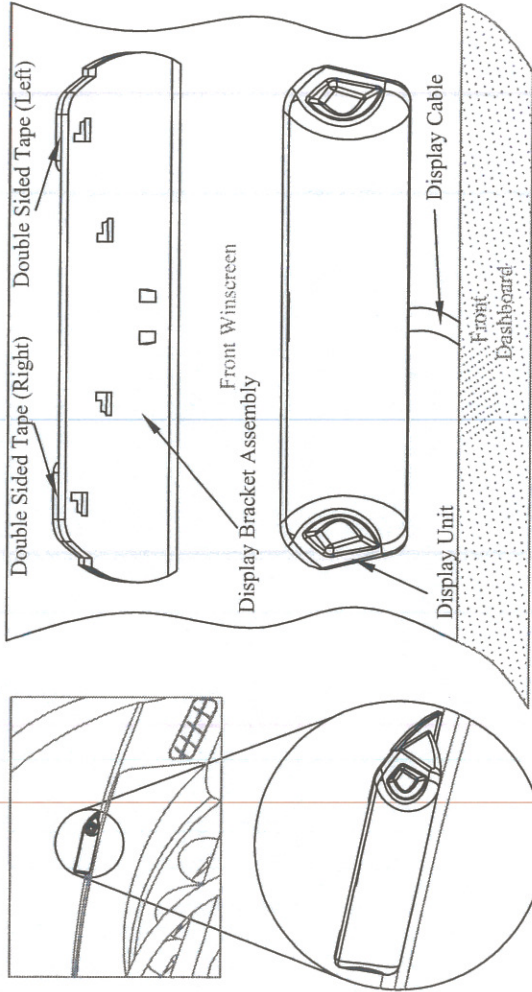


8 WIRING DIAGRAM FOR REAR VPC CONTROL UNIT





- ① Remove template guide sticker.
- ② Insert Holder Bracket into cutting slot.
- ③ Pull display cable out from cut hole.



10 INSTALLATION PROCEDURE

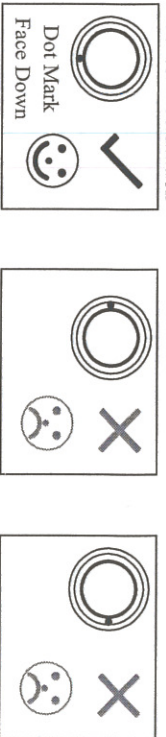
1. The display unit install location is recommended on front windscreen or rear roof top. The display unit is connected to the fuse box or doom lamp for power source with a display cable.
2. Find a good mounting position such as near-by sensors for control unit or according to control unit cable arrangement. Connect the control unit to the fuse box only by a control unit cable but leave the sensor connector open.
3. Test the power-line communication signal strength by turning the ignition key to 'ON', the display function indicator will light ON. If the display function indicator disappear after 3 seconds, the power connection is not suitable which need alternative power source or longer ACC & GND wires. If the connection is correctly installed, the display unit will start the below sequence.
 - 3.1. Each LED indicator will start to light ON.
 - 3.2. Buzzer sound beeping.
 - 3.3. Power-line communication signal strength indicator will appear.
 - 2 or less LED ON - NG (signal weak)
 - 3 or more LED ON - OK (signal good)
4. Then install or connect the control unit cable onto sensors respectively. Cable tie all the wire and fix the unit properly.
5. Finally test the system function follow the instruction accordingly. Each sensor correspond to left and right LED indication. If the left/right LED indication does not correspond to the correct sensor position, then proceed with Left/Right Selection wire connection (according guideline as explained). If there is over sensitivity or false alarm due to ground detection, adjust the sensitivity VR at control unit (according to guideline as explained).

11 INSTALLATION TOOLS REQUIRED

Hand Drill	Hole Saw	Measurement Tape	Plier
PVC Black Tape	Spanner	Scissor	Screw Driver

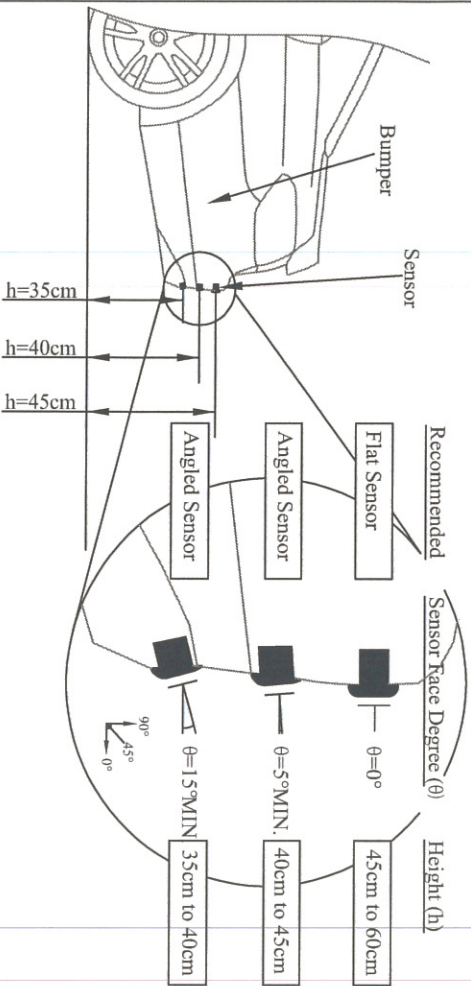
12.1 Precautions Before Installation

12.1.1 Sensor Orientation

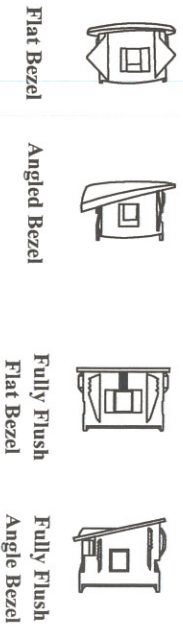


12.1.2 Sensor Installation Height

Locate 35cm to 60cm height from ground.



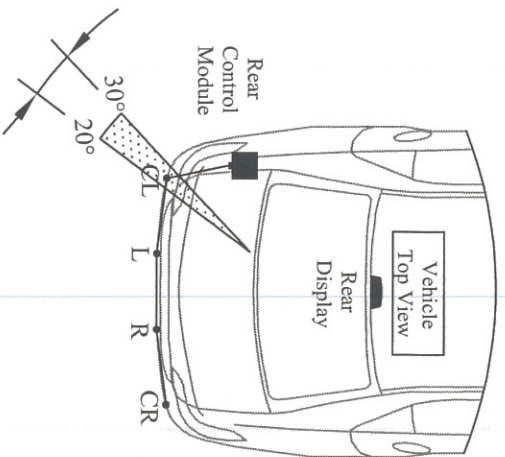
12.1.3 Sensor Bezel Type



12.1.4 Other Precautions

1. Sensor is sensitive to electronic ballast, servo motor and electronic device which can generate frequency interruption to the sensor function. It is advised to position the sensor far away from such noise or frequency devices. The control unit is also not recommended to position beside lead acid battery.
2. The power source for control unit shall not come direct from lead acid battery.
3. Use angled sensor if bumper is facing to ground. This is to prevent false alarm ground detection.

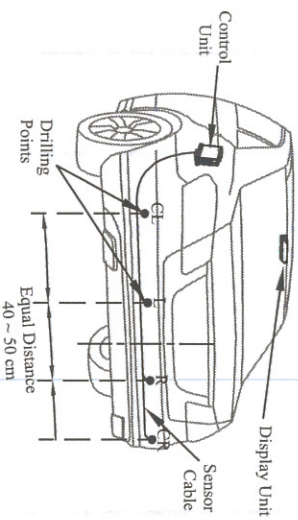
12.2. Parts Location



- CL - Corner Left Sensor
- L - Left Sensor
- R - Right Sensor
- CR - Corner Right Sensor

REAR SENSORS

12.3 Sensors Installation



1. **CL & CR Sensors Installation:**
Locate 20° to 30° (REAR) angle from top view of the bumper curvature.
2. Ensure CR & CL is symmetry to the center of the car.
3. **L & R Sensors Installation:**
Measure CL to CR length and divide by 3 to get an equal distance for R & L sensors location.
4. The distance between each sensor should NOT be more than 50cm.
5. Ensure the distance of every sensor are symmetry to the center of the car. Please refer to Table 1 to determine the suitable hole saw size.
- 6.

Bezel Type	Hole Saw Size	
	3.5mm and below	More than 3.5mm
Flat	Ø 21mm	Ø 22mm
Angle Flat	Ø 21mm	Ø 22mm
Fully Flush Flat		Ø 21mm
Fully Flush Angle		Ø 21mm

Table 1

Note: Ensure drilling locations on the bumper surface is flat and not facing the ground. Ensure drilling locations are not obstructed by the bumper brackets behind the bumper.