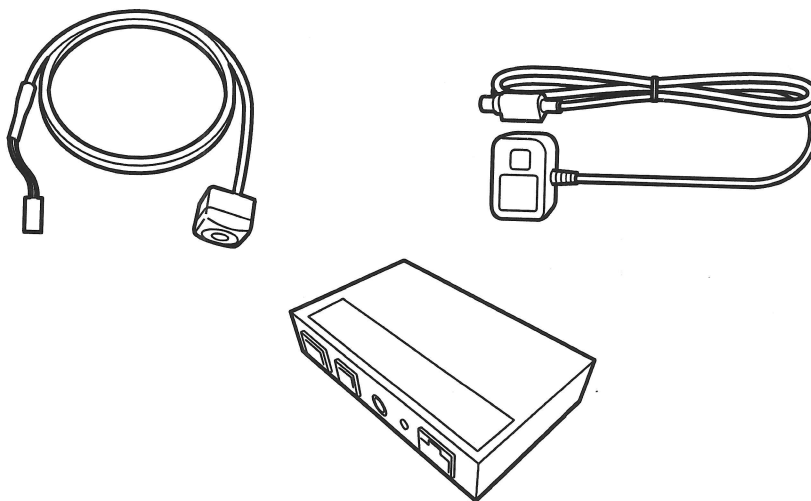




## INSTALLATION MANUAL

## CCA-RV100/US

### AirCam™ Monitoring System



#### CAUTION

- Installation and wiring require technical expertise and experience. To ensure proper installation and safety, consult the dealer where the product was purchased.





# CONTENTS

SAFETY PRECAUTIONS.....	1
BEFORE INSTALLATION .....	3
ACCESSORIES AND HARDWARE .....	4
CAUTIONS FOR CONNECTION .....	5
CONNECTION .....	6
INSTALLATION .....	8
CHECK THE IMAGE INDICATION AREA AND SECURE THE CAMERA TIGHTLY .....	12
ABOUT CALIBRATION .....	12
PROTRACTOR .....	13

## SAFETY PRECAUTIONS

### <Safe and correct use of the product>

- Before using the AirCam™ Monitoring System, read this instruction manual for proper use of the product as directed.
- Sanyo and its suppliers are not responsible for damage or malfunction that arises from the failure to follow the instructions in this manual. Please be aware that the manufacturer's warranty may be invalid if the procedures in this instruction manual are not followed properly.
- After using this instruction manual, store it in a place where it can be easily located.

 <b>WARNING</b>	A WARNING indicates a situation in which serious injury or death could result if the warning is ignored.
 <b>CAUTION</b>	A CAUTION indicates a situation in which bodily injury or damage to objects, or both, could result if the caution is ignored.

### WARNING

- Be sure to disconnect the negative battery terminal when wiring. Electric shock or injury due to a short circuit could occur.
- This AirCam™ Monitoring System is for exclusive use with DC 12V and DC 24V, negative ground vehicles. Do not use the vehicle with other electrical system, Otherwise, a fire or other damage could occur.
- Do not install this AirCam™ Monitoring System in a location that blocks the rear view, or obstructs the operation of the steering wheel, shift selector lever, or brake pedal when driving, or jeopardizes the safety of other passengers. Otherwise, an accident or injury could occur.
- When installing this AirCam™ Monitoring System to a vehicle equipped with air bags (The name differs depending on the manufacturer, such as SRS dual air bag, SRS side air bag, SRS curtain air bag), do not install this AirCam™ Monitoring System or route its wiring where it affects operation of the air bag system. If the air bags do not operate properly in an emergency, an accident or injury can occur. (Consult the dealer where the product was purchased to determine the installation position, keeping safety in mind.)

- Do not use any cables other than ones provided with this AirCam™ Monitoring System. Do not modify the cables.
- If installing this AirCam™ Monitoring System or connecting the ground using the vehicle nuts and bolts, never use nuts and bolts from critical parts of the vehicle such as the steering wheel, brake system, and fuel tank. Vehicle control may become inoperative, or a fire could occur.
- When drilling holes into the vehicle body to install this AirCam™ Monitoring System, check the locations of pipes, tanks, and electrical wiring so that this AirCam™ Monitoring System will not interfere with them. Otherwise, a fire or other malfunction could occur.
- Be sure to bundle cables so that they do not obstruct driving. Loose cables which become entangled in the steering wheel, shift selector lever, or brake pedal may cause an accident.
- Do not splice the cable to connect the power supply to other devices.
- After completing the installation and wiring, make sure the brake lights, lights, horn, turn signals, wipers, and other electrical components operate properly. Otherwise, an accident could occur.
- Do not disassemble or modify the AirCam™ Monitoring System. Disassembly prohibited. It could result in an accident, fire, or electric shock.
- If foreign material has penetrated the AirCam™ Monitoring System or liquid has spilled onto it, which may produce smoke, foul odor, or abnormal noise, discontinue use immediately and always consult the dealer where the AirCam™ Monitoring System was purchased. If the AirCam™ Monitoring System continues to be used, it could result in an accident, fire, or electric shock.
- If power to the power cable has been cut or a fuse has blown, verify that the cable has not been shorted, and replace any blown fuses with a new fuse of the same current rating. (Ampere is displayed on the fuse.) If a non-specified fuse is used, a fire or malfunction could occur.
- Be sure to route wiring so that it does not come into contact with heated parts. Otherwise, the wire covering will melt and cause a short, resulting in a fire or electric shock.
- Do not use this AirCam™ Monitoring System if it appears damaged such as when there is no display or sound output. Otherwise, it could result in an accident, fire, or electric shock.
- Do not touch this AirCam™ Monitoring System during extreme weather conditions such as thunder and lightning. Otherwise, it could result in electric shock.

#### • **FOR AMERICAN USERS**

The following advisory is included in accordance with the laws of the State of California(USA):

#### **WARNING:**

This product contains chemicals, including lead, known to the State of California to cause cancer, birth defects or other reproductive harm. **Wash hands after handling.**

## **CAUTION**

- Installation and wiring requires technical expertise/experience. To ensure safety, consult the dealer where the AirCam™ Monitoring System was purchased.
- Be sure to use the AirCam™ Monitoring System in the specified manner. If a non-specified part is used, the internal parts of the AirCam™ Monitoring System can be damaged or detach because of improper attachment, resulting in an accident.
- Do not install the ECU box to a location where rain, moisture, or dust can penetrate. If water, moisture, or dust penetrates the ECU box, it may cause fire or smoke.
- Do not install the ECU box where heat is retained such as under a carpet. Heat from the ECU box cannot be dissipated, causing a fire, malfunction, or deterioration.
- Wire the cable so that it does not touch any metallic areas. The cable could be damaged from contact, causing a fire or electric shock.
- Route wiring properly according to the instructions. An incorrect connection might cause a fire or accident.
- Be careful and prevent the wiring harness from being pinched between the vehicle body, screws, or moving parts such as the seat rails. It could cause an accident, electric shock, or fire due to an open or short circuit.



- The AirCam™ Monitoring System has been designed to be used for automotive applications only. The entire contents of this product (camera, ECU box and accessories) are not designed to be used in other applications (i.e., home security video, etc.). If the AirCam™ Monitoring System is used in environments and applications that it was not designed for, it may cause bodily harm and/or cause damage to the product. Please consult the instruction manual and installation manual regarding the correct application, installation and use of this product.
- This AirCam™ Monitoring System has been designed to assist the driver in confirming the around view when driving up the vehicle into a garage or when parallel parking. For safety reasons, it is important for the driver to take extra precautions when driving.

## **BEFORE INSTALLATION**

---

### **AirCam™ Monitoring System installation cautions**

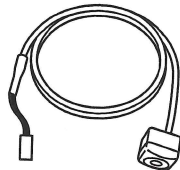
- Bundle cables with tape or string so that they do not obstruct driving. Cables that become entangled in the steering wheel, shift selector lever or brake pedal could cause an accident.
- Make sure to secure the camera bracket firmly to the vehicle's body. If it is not secured firmly, the camera bracket may fall off during driving.
- Install the camera so that it does not obstruct the opening or closing of the liftgate.
- Installing the camera in a position that obstructs vision is dangerous and could cause an accident. Install the camera so that it does not obstruct the rear view or vehicle operation, and make sure it does not protrude excessively beyond the sides of the vehicle.

#### **Notes**

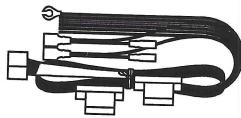
- *Temporarily hook up the system, confirm that the system functions properly, and then install it permanently. If the system does not function properly, re-check the connections.*

## ACCESSORIES AND HARDWARE

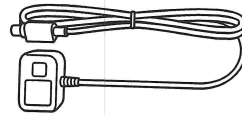
Make sure all the following parts are included in the AirCam™ Monitoring System kit.



Camera unit...4 pcs.  
(approx. 3.3 ft. long)



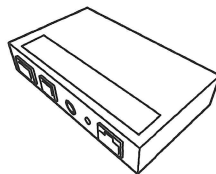
Power supply cable...1 pc.  
(approx. 4.9 ft. long, with fuse)



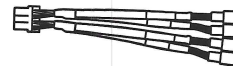
Control switch unit...1 pc.  
(approx. 3.3 ft. long)



Switch extension cable...1 pc.  
(approx. 9.8 ft. long)



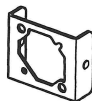
ECU box...1 pc.  
(Electronic Control Unit box)



Camera connection cable...1 pc.  
(approx. 7.9 in. long)



Video output cable...1 pc.  
(approx. 6.6 ft. long)



Bracket...4 pcs.



Screw (For bracket) ...8 pcs.  
(Hexagon type, M3 x 6)



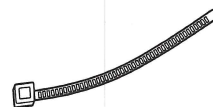
Hexagon wrench...1 pc.



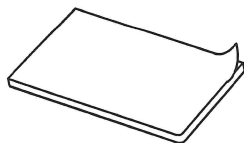
Stand...4 pcs.



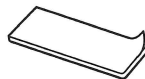
Screw (For camera) ...8 pcs.  
(M3 x 6)



Wire band ...7 pcs.



Double sided tape... 1 pc.  
(for ECU box)



Double sided tape... 1 pc.  
(for switch pad)



Screw (For ECU box) ...4 pcs.  
(M4 x 10)

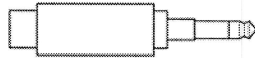
## CAUTIONS FOR CONNECTION

---

### CAUTION

- Before connecting, disconnect the negative battery terminal. Connect the negative battery terminal after all other connections are completed.
- Check the shape of each connection terminal and accessory cable and connect properly. Make sure connectors are securely inserted until a click sound is heard. Incomplete connection may cause a distorted picture or operation errors.
- Connect each camera as shown on label of camera connection cable. If a camera is connected incorrectly, it is impossible to monitor correctly.
- Before disconnecting the connector, turn the ignition switch to the off position. Otherwise, it may cause a malfunction. When disconnecting the connector, hold the connector itself to remove it while pressing the connector lock. If the cable is pulled, it may come off, causing a malfunction.
- Do not splice the power supply cable to connect it to the power source of other devices. A fire or electric shock could occur due to excess current flow on the power cable.
- Do not connect this AirCam™ Monitoring System to the power supply for the CAMERA, which some navigation systems are equipped with.
- If your video monitor input uses mini mono jack (1/8" type), then you must use an adapter (RCA female jack to mini mono plug). The adapter can be purchased at an electric store.

RCA female jack



1/8" mini mono plug

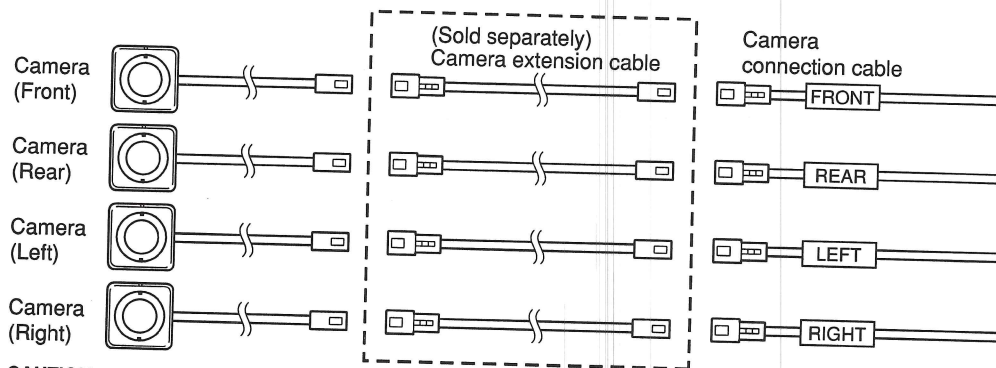
# CONNECTION

## ⚠ CAUTION

- Installation and wiring require technical expertise and experience. To ensure proper installation and safety, consult the dealer where the product was purchased.

## Notes

- Always use the same type of fuse with the same current rating when replacing it.
- When connecting to a navigation system or an external monitor, also refer to the manual provided with the unit.
- Depending on the type of vehicle or navigation system, the AirCam™ Monitoring System may not function as expected. Consult the dealer where the product was purchased.



## ⚠ CAUTION

- Put the entire camera connector in the vehicle body and secure it firmly.

## Notes

- All the cameras are the same.
- You can use any camera as FRONT, REAR, LEFT or RIGHT one.

Connect to camera input terminal or video input terminal on navigation or external monitor. Do not split video signal to multiple monitors.



(Yellow)

Connect to monitor trigger "Wake Up" signal input terminal on navigation or external monitor.



(Brown)

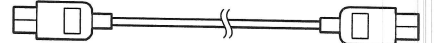
Connect firmly to a metal part of vehicle (for grounding).

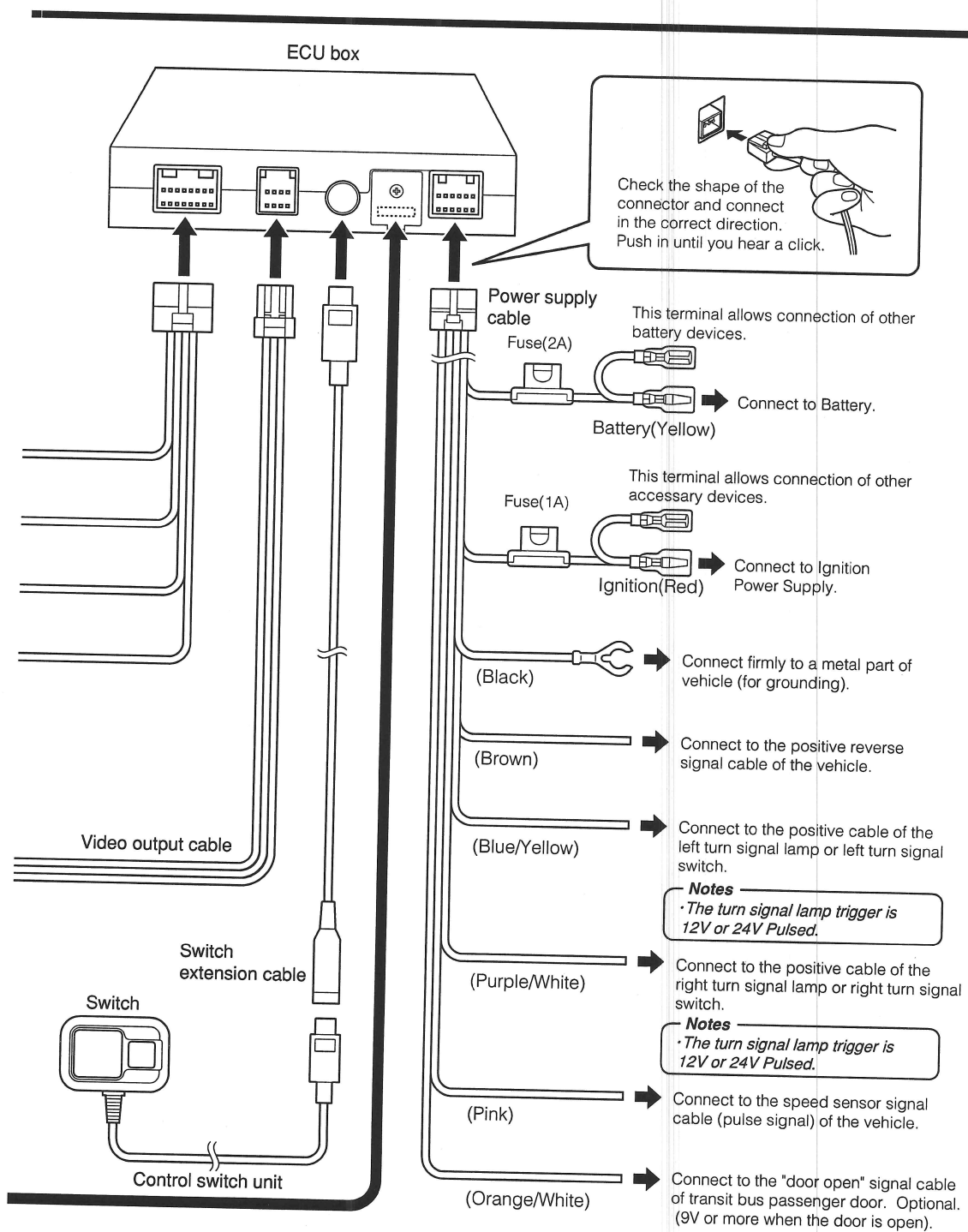


(Black)

(Sold separately) USB adapter for calibration

Connect to the PC





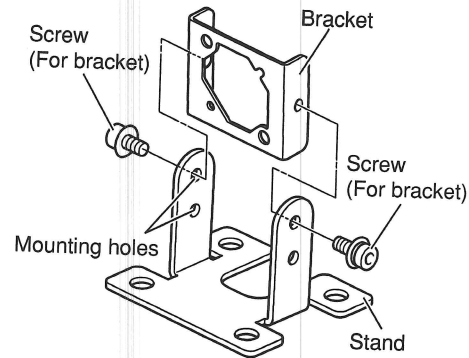
# INSTALLATION

## Installation of camera and bracket.

1. Install the stand to the bracket.  
Install the screw(for bracket) using the included hexagonal wrench.

### ⚠ CAUTION

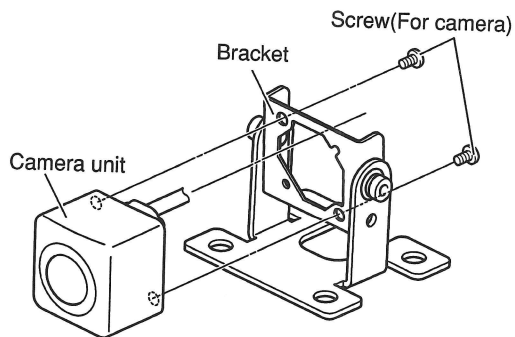
- There are four sets in total. Secure all the sets in the same way.
- Check the screws(for bracket) periodically and tighten if there is a loose one.
- The stand has two mounting holes for adjusting height. Select an appropriate hole depending on usage.



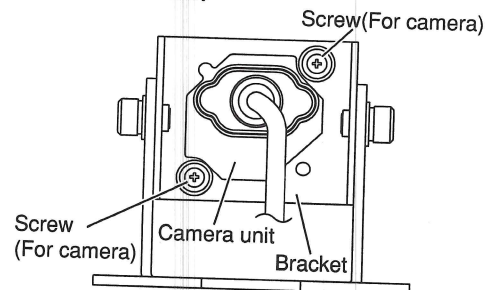
2. Install the camera unit to the assembled bracket set.  
Install the camera unit to the bracket as shown in rear view and secure with the 2 phillips head screws(for camera).

### ⚠ CAUTION

- Please make sure the screw holes line up correctly.
- Do not install with the camera unit upside down or it will not be secured to the bracket tightly.
- There are four sets in total. Secure all the sets in the same way.
- Check the screws(for camera) periodically and tighten if there is a loose one.



〈Rear view〉



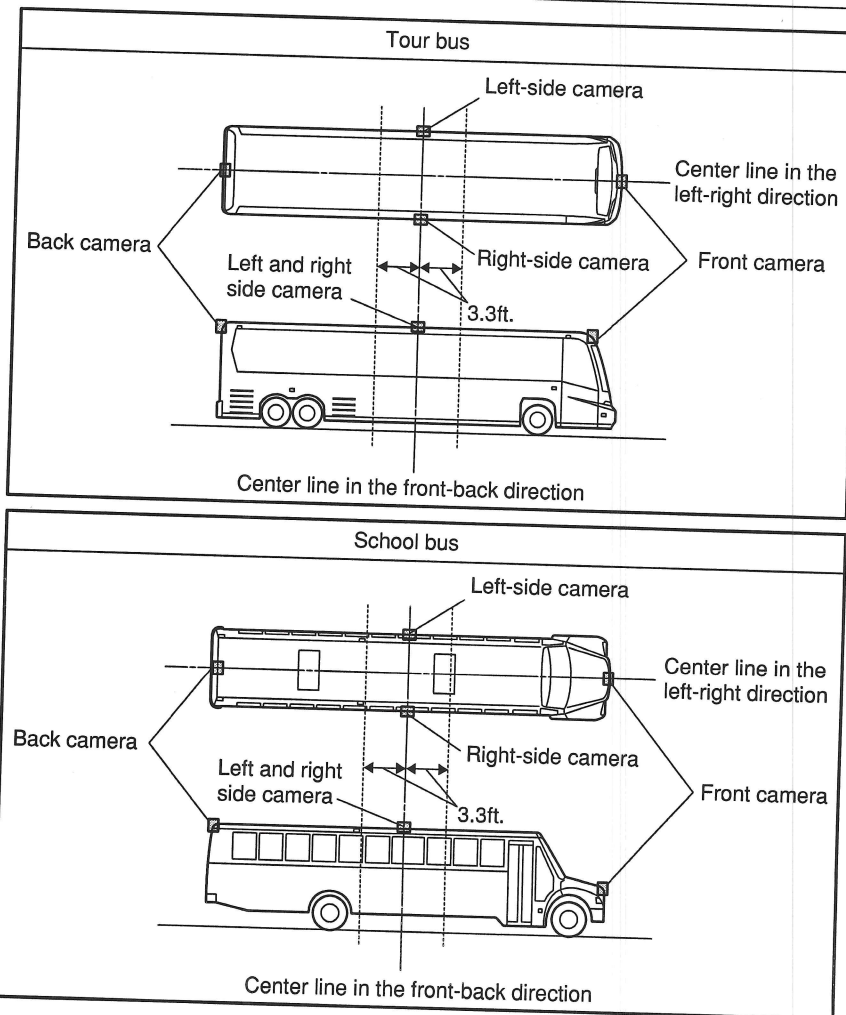


## Installation position of cameras and installation

1. Refer to the following figure for the installation position of cameras.

### ⚠ CAUTION

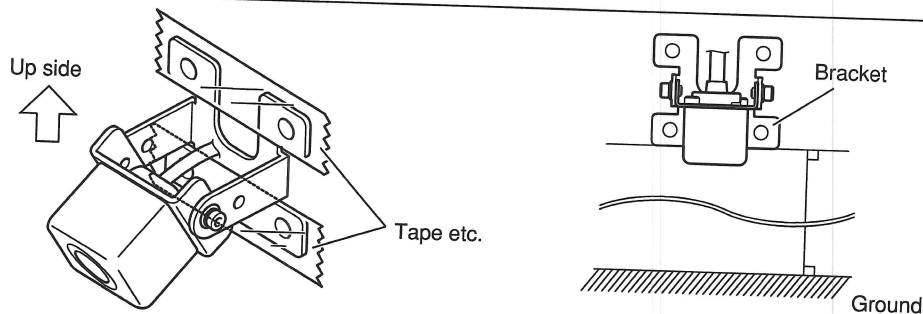
- Install the Right-side and Left-side cameras within 3.3 feet of the vehicle's center line front to back.
- Install the Right-side and Left-side cameras as high as possible on the lateral sides of the vehicle.
- Install the Front and Back cameras as close to the vehicle's center line in the horizontal direction as possible on the front and rear sides of the vehicle respectively.
- Install the Front and Back cameras as high as possible on the front and rear sides of the vehicle.  
(If the vehicle has a hood, install front camera as high as possible on the edge of the hood.)



- Secure the Front, Back, Right-side and Left-side cameras at the positions described in the step 1 temporarily with tape.  
Secure tentatively, not fully, in this step because the installation position may be changed during calibration.

**CAUTION**

- Do not locate the camera upside down. If the camera is located upside down, it is impossible to monitor correctly.
- Install the bracket so that it is even with the ground.



## Adjustment of camera angle

- Adjust the camera angle.

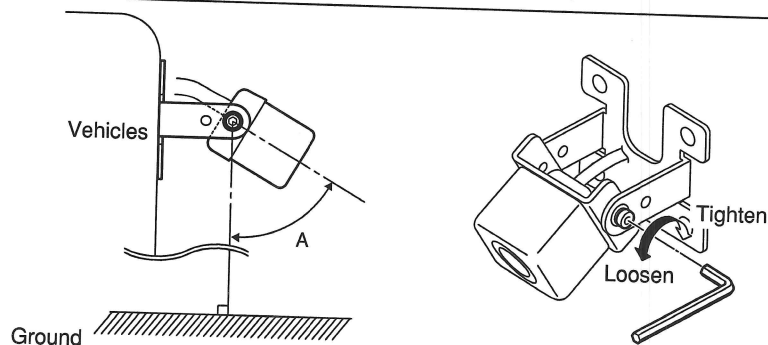
Loosen the bracket mounting screw with the included hexagonal wrench, adjust the angle using the protractor included in this installation instructions, and retighten the mounting screw securely.

Installation angle of cameras (A)

- Front and Back cameras: 45 degrees  $\pm$  5 degrees from vertical direction to the ground.
- Right-side and Left-side cameras (R), (L): 40 degrees  $\pm$  5 degrees from vertical direction to the ground.

**CAUTION**

- Check the camera mounting screws periodically and tighten if there is a loose one.



- Check image using the calibration kit (sold separately) after the adjustment.



## Installation of ECU box

### CAUTION

- Secure at a position so that drivability will not be impaired.

Secure tightly with the provided screw.

## Installation of control switch unit

### CAUTION

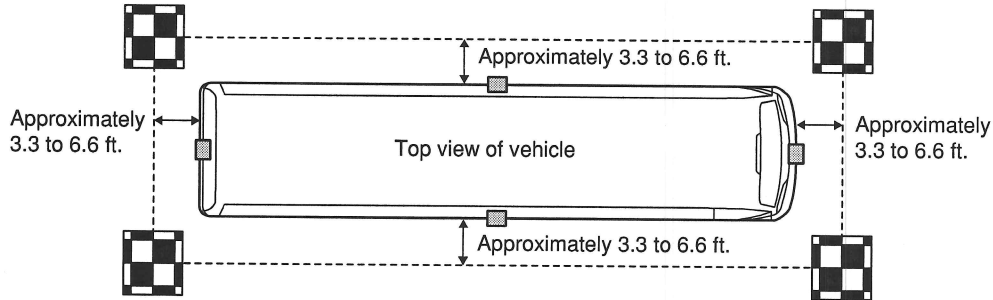
- Secure at a position so that drivability will not be impaired.

Remove dirt, oil or the like on the surface where double-sided tape is to be attached before attaching the tape.

## **CHECK THE IMAGE INDICATION AREA AND SECURE THE CAMERA TIGHTLY**

1. Place the calibration patterns.

Place the calibration patterns around the four corners of the vehicle as pictured below.  
(Patterns not included with CCA-RV100/US)



2. Check that the calibration patterns is monitored properly.

Confirm the camera images are oriented properly.

\*It is necessary to run the calibration software to check camera images. Refer to the description in the "About calibration" section.

### **⚠ CAUTION**

- If the images are not monitored properly, adjust the installation position and installation angle of the cameras.

3. Secure the bracket for stand to the vehicle.

Secure to the vehicle tightly using tapping screws, bolts, nuts, etc.

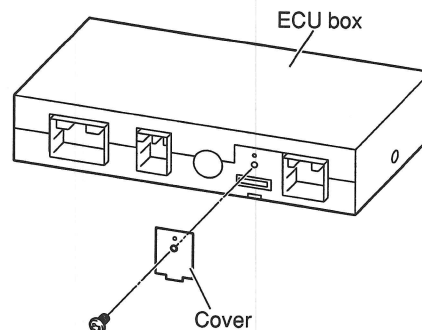
**Recommended screw: M5 (Screw diameter of 0.2 in.)**

## **ABOUT CALIBRATION**

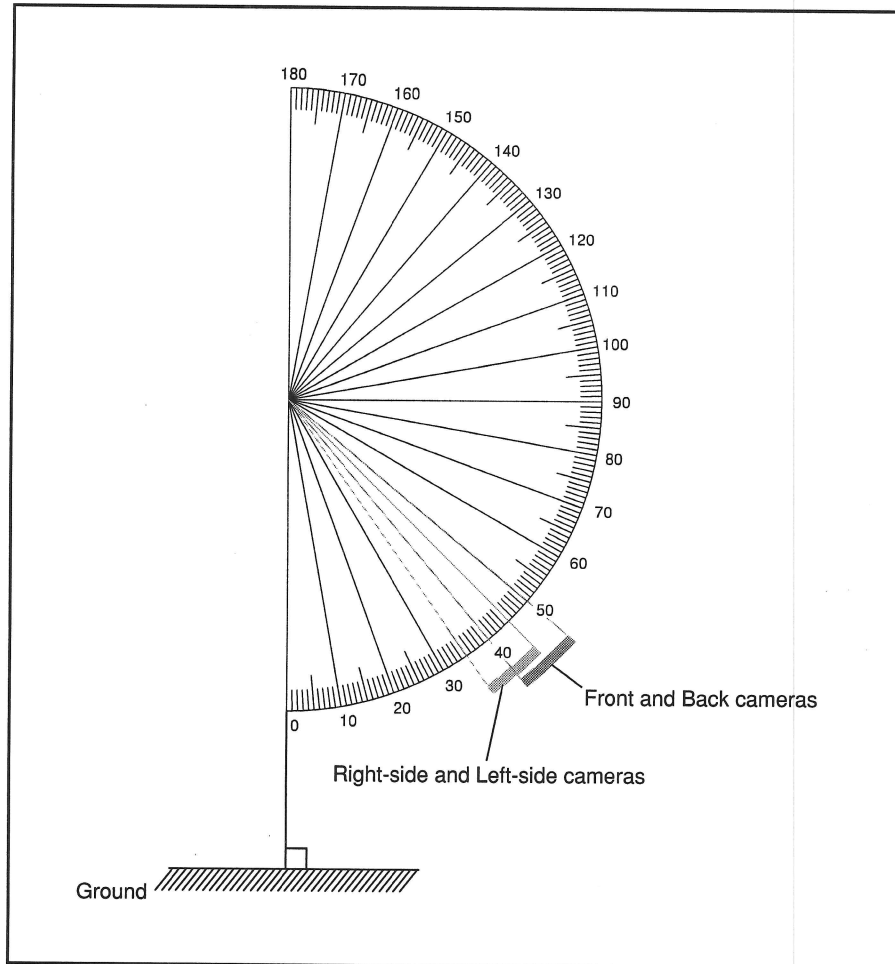
Purchase the calibration kit (sold separately) and calibrate referring to the included instructions.

Remove the programming port cover plate on the ECU box to connect the USB programming cable.

Replace the cover plate after calibration is complete to prevent foreign debris from entering the ECU box.



# PROTRACTOR



2RR6P12A65300