



SAFE-T-SCOPE®

REARVIEW BACKUP CAMERA SYSTEMS



STSK7360

INSTALLATION / USER'S MANUAL

TABLE OF CONTENTS

Safeguard Instructions	2
Features & Contents.	4
Installation Instructions	6
Wiring Camera & Monitor	7
Functions & Operations	8
Setting	16
Installation of U-Bracket	18
Installation of Duckfoot Mount.	19
Connection.	20
Figure Drawings	21
Specifications	26

STSK7360 SAFE-T-SCOPE® 7" COLOR BACKUP CAMERA SYSTEM

Rosco Vision Systems introduces a revolutionary new backup camera system for commercial vehicles. The STSK7360 Safe-T-Scope® backup camera system utilizes a 7" inch monitor to display a 16:9 LCD screen when the vehicle shifts into reverse. This monitor allows the driver to see obstructions behind the vehicle for added convenience and safety.

The camera has an advanced CCD image sensor able to process excellent views under dark and light conditions. A 120° diagonal field of vision yields superb coverage behind the vehicle, and complies with the latest U.S. DOT guidelines when installed properly.

SAFEGUARD INSTRUCTIONS

7" Waterproof Monitor

Please read the "Safety Rules" carefully before using this product.

Following the safety rules prevents users from damage related with the misuse of the product. It is very important to follow these safety rules.

We state "Caution" and "Warning" to clarify any potential risk for a damage associated with the misuse of the product.



This information is for the user's reference for better usability.



This information is for preventing damage.



This information is for preventing bodily harm. User should follow safety rules.



CAUTION

- Install all components while power is off.
- **FAILING TO DO SO MAY CAUSE ELECTRONIC SHOCK OR MALFUNCTION.**
- Do not connect the product directly to the battery, use switched ignition.
- **DOING SO MAY DRAIN THE BATTERY**
- Do not use this product with multi socket or extended adaptor.
- **DOING SO MAY CAUSE UNEXPECTED HEATING, FIRE AND MALFUNCTION.**
- When product is not in use for an extended period of time - power off the monitor
- **FAILING TO DO SO MAY CAUSE FIRE BY SHORT CIRCUIT DUE TO HEATING.**
- Do not place near magnetic devices.
- **DOING SO MAY CAUSE SCREEN DISTORTION OR PERMANENTLY DAMAGE THE LCD.**

* Please ensure that the monitor is installed with enough room for heat emission.

SAFEGUARD INSTRUCTIONS



CAUTION

- Do not install product in direct sunlight, high temperature, or extremely humid areas
- **THIS MAY CAUSE ELECTRONIC SHOCK OR MALFUNCTION.**
- Please use this product within the voltage range specified
- **THIS MAY CAUSE ELECTRONIC SHOCK OR MALFUNCTION.**
- Do not place this product where air bag operation may occur
- **THIS MAY CAUSE MALFUNCTION OF AIR BAG OR INJURY DUE FROM BAG HITTING MONITOR.**
- Do not place this product in high vibration areas without appropriate mounting
- **THIS MAY CAUSE DAMAGE OR MALFUNCTION**
- Do not drill or screw directly into body
- **THIS MAY CAUSE ELECTRONIC SHOCK, FIRE AND MALFUNCTION**
- If the monitor is emitting smoke or a burning smell disconnect immediately
- **THIS MAY CAUSE FIRE**
- Do not disassemble, repair or remodel
- **THIS MAY CAUSE MALFUNCTION AND INJURY, VOID WARRANTY**
- Do not disassemble, repair or remodel
- **THIS MAY CAUSE MALFUNCTION AND INJURY, VOID WARRANTY.**
- When the power cable cord touches a metal case, cover it with a friction tape.
- **SHORT CIRCUIT OR DISCONNECTION OF WIRE MAY CAUSE A FIRE.**

* After finishing the installation, please check that the brake lamp, head lamp, and wipers operate properly.

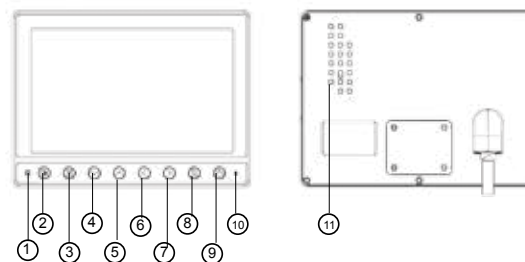
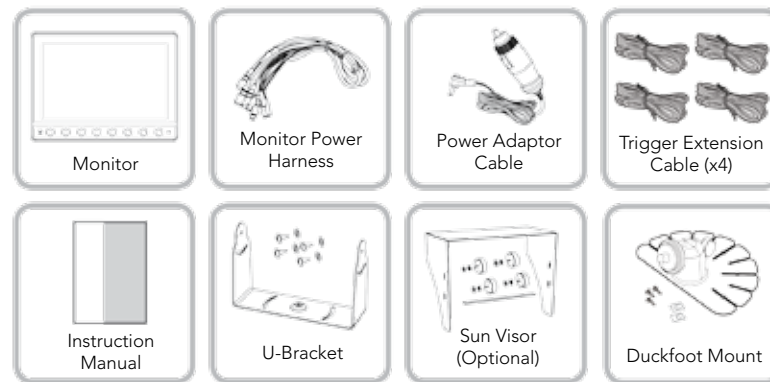
FEATURES & CONTENTS

FEATURES - 7" WATERPROOF MONITOR

- Dimmer sensor built in
- 7" WVGA (800 x 480) Wide LCD Panel

CONTENTS -7" WATERPROOF MONITOR

- Before using this product, please check contents below. If there are any missing parts please contact a Rosco sales agent or dealer.



CONTROLS

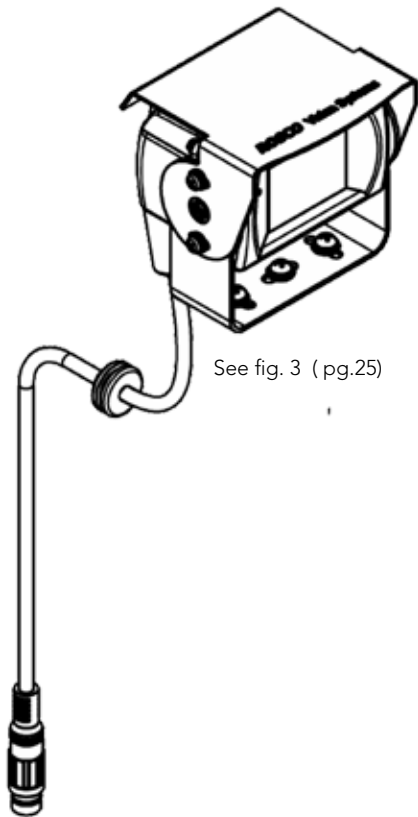
- | | |
|--|--------------------------|
| 1. Automatic brightness control sensor | 6. Left |
| 2. Dimmer | 7. Right |
| 3. Mode | 8. Menu |
| 4. Up | 9. Power |
| 5. Down | 10. Stand by lamp |
| | 11. Speaker (Waterproof) |

STSM207 MONITOR SPECIFICATIONS

Screen Size (Diagonal)	7"
Maximum No. of Cameras	4 Inputs/Channels
Screen Ratio	16:9
Split Screen Function	Quad (4)
Contrast Ratio	300:1
Video System	NTSC
Voltage Input	12~24 Vdc
Operating Temperature °F (C°)	-22° to 158° (-30° to +70°)
Storage Temperature °F (C°)	-40° to 176° (-40° to +80°)
Dust/Water Rating	IP67
Shock Rating	100g
Vibration Rating	15g
Speaker Impedance	8 Ohms
Weight	1.5 lbs.
Dimensions W x H x D	7" x 5.30" x 1"
Sun Shade	Included
Brightness	400 cd/m2
Monitor Mounting Options	Versatile Duckfoot & U-Bracket

* Design and specification are subject to change without notice.

FEATURES AND CONTENTS



STS107 CAMERA SPECIFICATIONS

Image Device	1/3" CCD
Pixels	250,000
TV Lines	380
InfraRed LED's	6 High-Output
Night Vision Range	30 Feet
Video Output	1.0 Vp-p, 75 Ohm
Dust/Water Rating	IP67
Shock Rating	100G
Vibration Rating	15G
Field of View	145°
Operating Temperature °F (°C)	-22° to 158° (-30° to +70°)
Storage Temperature °F (°C)	-40° to 176° (-40° to +80°)
Weight	.5 lb.
Dimensions W x H x D	2.5" x 1.7" x 2.5"
Audio	Yes
Construction	Cast Aluminum Housing w/ Stainless Steel Mounting Bracket & Weather Shield

INCLUDES STSH307 (60' HARNESS)

INSTALLATION INSTRUCTIONS

IMPORTANT: FOR TYPICAL REAR-VIEW INSTALLATION, THE REAR CAMERA MUST BE CONNECTED TO THE MONITOR POWER DISTRIBUTION HARNESS AT THE CONNECTOR MARKED "REVERSE"

Note: The following instructions are for a typical rear-view application.

STSC107 CAMERA

1. Attach camera bracket close to rear marker lights, centered on vehicle (see Fig. 1). Attachment point must be sturdy enough to support camera and bracket.
2. We do not recommend mounting the camera near the lower area of the vehicle (ex: bumper). This reduces the view of the camera and increases the chance of physical damage to the camera.
3. Attach camera to bracket using screws provided. Adjust angle as indicated in Fig. 2. (Use rear bumper and back of vehicle as a reference point.)
4. Wind deflector may be installed. This deflector is designed to reduce the buildup of dust, dirt and moisture on the camera lens. (See Fig.3)

STSM207 MONITOR

1. Attach monitor inside vehicle in a location convenient to the driver (ex: center of dash, overhead, or flush-mounted in dash).
2. Attach the "duckfoot" bracket to the dashboard or to the headliner using self-tapping screws and/or adhesive pad.
3. Fasten monitor to "duckfoot" and adjust mounting angle to allow optimum driver viewing comfort. (See Fig. 4.)

CAMERA

1. The camera to cable connection is waterproof. Be sure to position the cable properly. The male end attaches to the camera. The female end attaches to the power/video/audio distribution harness, typically located under the dashboard. (See Fig. 5.)

IMPORTANT: FOR TYPICAL REAR-VIEW INSTALLATION, THE REAR CAMERA MUST BE CONNECTED TO THE DISTRIBUTION HARNESS AT THE CONNECTOR MARKED "REVERSE"

2. Do not run the cable over sharp edges or corners. Do not kink or excessively bend the cable.
Keep the cable away from hot and rotating parts.
3. Fasten all cable runs, and secure all excess cable.

WIRING CAMERA AND MONITOR

1. Connect the red wire to an ignition switched accessory (ex: radio) power source, and connect the black wire to chassis ground. See wiring diagram for connections (See Fig. 5.)
2. Before drilling, be sure no cable or wire is on the other side. Be sure to drill a 20mm (0.8in) diameter hole only.
3. Feed as much cable as possible into vehicle and clamp securely. This reduces the possibility of it being hooked or snagged.
4. Keep all cables away from HOT, ROTATING and ELECTRICALLY NOISY components.
5. Camera: Drill a 20mm (0.8in) diameter hole into vehicle body near the camera and bracket. Insert camera cable into vehicle (be careful not to kink cable) and fit grommet into hole. Apply sealant around grommet to increase resistance to water penetration. Connect camera to the camera extension cable which runs inside the vehicle.
6. Monitor: The monitor terminates in a 13-pin connector, which should be connected to the mating 13-pin receptacle end of the power/video/audio distribution harness.
7. For typical rear-view installation, connect the camera extension cable from the rear-view camera to the harness's connector marked REVERSE.
8. For multi-camera installations, be sure to mark each extension cable properly and connect to the appropriate harness connector marked CA1 or CA2. Bundle excess cable together using a cable tie or electrical tape.
9. The green wire is the REVERSE trigger wire. In typical rear-view installations, connecting this wire to the vehicle's backup light circuit will activate the rear-view image whenever the vehicle shifts into reverse.
10. FUEL TANKERS & OTHER SPECIALTY VEHICLES: All electrical equipment fitted to petroleum vehicles must be connected via battery master switch and must be isolated from the battery while the vehicle are loading and unloading. For other specialty vehicles, please check applicable code and regulations prior to installation.
11. Always consult your dealer when fitting any electrical or electronic equipment to a vehicle fitted with a CAN-bus or multiplex system.


IMPORTANT: FOR INSTALLATIONS REQUIRING MULTIPLE CAMERAS, OR FOR INSTALLATIONS NOT REQUIRING TYPICAL REAR-VIEW IMAGES, PLEASE REFER TO THE WIRING DIAGRAM (FIG.5) AND THE PARTICULAR VEHICLE'S ELECTRICAL SCHEMATIC FOR SELECTION OF PROPER POWER AND TRIGGER CONNECTION POINTS.

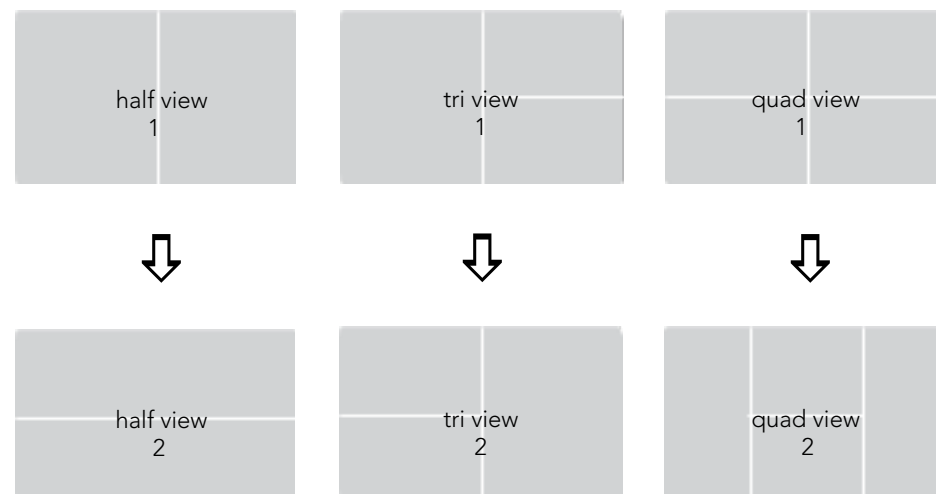
MONITOR FUNCTIONS AND OPERATIONS

MONITOR

1. **POWER**
When the ignition is switched on, the monitor will be in standby mode (no image will be on the screen), waiting for trigger signal.
When a trigger wire is energized by 12v power (such as backup lights turning on), the image captured by the selected camera will appear on the monitor.
2. Pressing the power switch will change the monitor status from standby to steady-on. Steady-on mode status will show rear cameras view.
3. **VOLUME +/-**
Adjust Speaker Volume
These buttons are also used to adjust the values within selected setting of menu option
4. **MODE**
Switching the screen mode.
Press MODE once
Full screen changes to 2 split screen.
Press Mode twice
2 split screen changes to 3 split screen.
Press Mode three times
3 split screen changes to 4 split screen.
Press Mode four times
4 split screen changes back to full screen.

SPLIT SCREEN & CAMERA FUNCTION

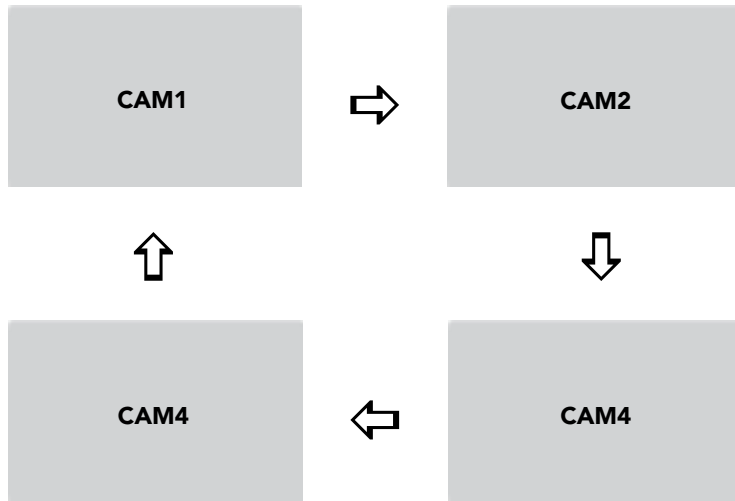
1. **SPLIT SCREEN SWITCH**
In the split screen, press  button to view the alternate split screen views



FUNCTIONS AND OPERATIONS

2. CAMERA SELECTION

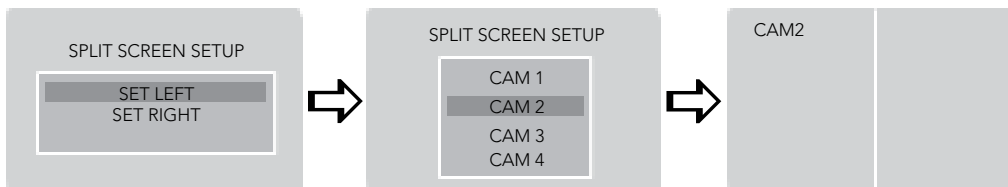
From the FULL SCREEN in the full screen, press the $\wedge \vee$ button to see CAM1 > CAM2 > CAM3 > CAM4 > CAM1



Press the "Mode" button to display the screen information (Input Mode/Volume)

3. CAMERA SELECTION FOR SPLIT SCREENS

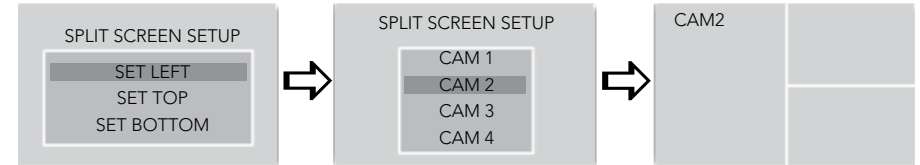
In the 2 split screen press the "Mode" button to see the OSD(On Screen Display). While the OSD is on select with the $\wedge \vee$ button the camera position (Left or Right). Then press the arrow to select the camera of choice.



FUNCTIONS AND OPERATIONS

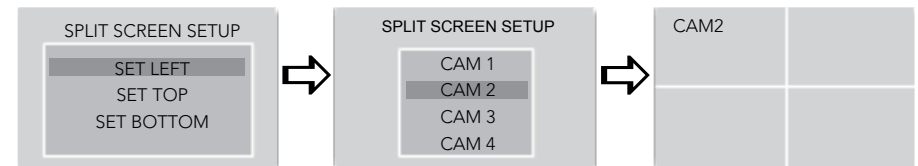
4. CAMERA SELECTION FOR 3 SPLIT SCREENS

In the 3 split screen press the "Mode" button to see the OSD (On Screen Display). While the OSD is on, select with the $\langle \rangle$ button the camera position (Left, Top or Bottom). Then press the \rangle button to select the camera of choice.



5. CAMERA SELECTION FOR 4 SPLIT SCREENS

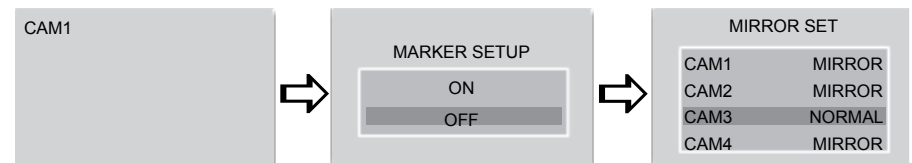
In the 4 split screen press the "Mode" button to see the OSD (On Screen Display). While the OSD is on, select with the $\langle \rangle$ button the camera position (Top Left, Top Right, Bottom Left or Bottom Right). Then press the \rangle arrow to select the camera of choice.



NORMAL/MIRROR VIEW

1. CAM1 FULL SCREEN

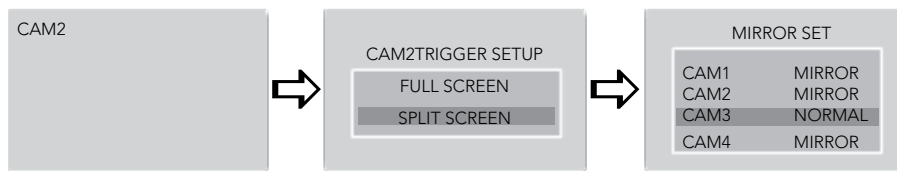
From the CAM1 full screen press the "Mode" button. From the "MARKER SETUP" screen press the "Mode" button again. Select the desired camera with the then press \rangle button to change Normal/Mirror view.



FUNCTIONS AND OPERATIONS

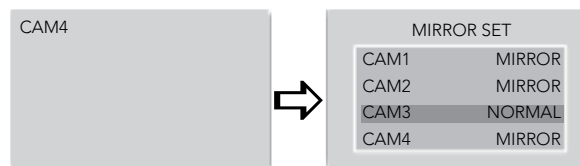
2. CAM2 OR CAM3 FULL SCREEN

From the CAM2 or CAM3 full screen press the "Mode" button. From the "CAM2 TRIGGER SETUP" screen press the "Mode" button again. Select the desired camera with the $\wedge \vee$ button then press \rangle button to change Normal/Mirror view.



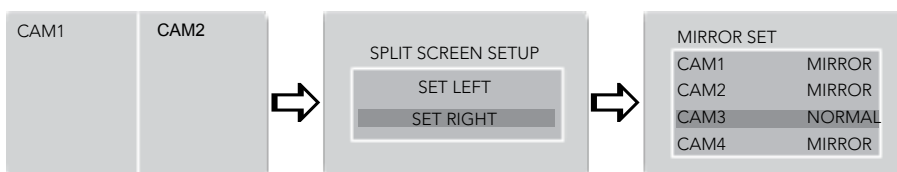
3. CAM4 FULL SCREEN

From the CAM4 full screen press the "Mode" button. Select the desired camera with the $\wedge \vee$ button then press \rangle button to change Normal/Mirror view.



4. SPLIT SCREENS (2/3/4)

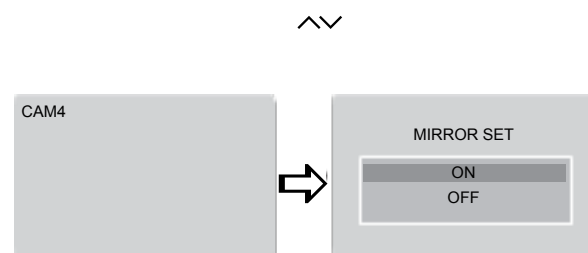
From any multiple screen views press the "Mode" button. From the "SPLIT SCREEN SETUP" select a camera press the "Mode" button again. Select the desired camera with the $\wedge \vee$ button then press \rangle button to change Normal/Mirror view.



FUNCTIONS AND OPERATIONS

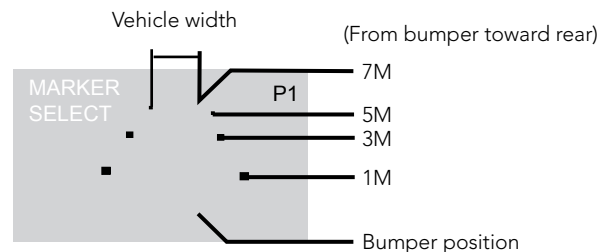
IMPORTANT

- The on screen distance markers should be considered as a general reference to assist the driver in assessing the distances depicted on the screen. The distance markers have been designed based on the "CCD camera installation conditions" listed in the next section, but differences in vehicle design and construction may result in the actual installation condition or location being different from the conditions listed. In such cases, the display location should be set at the closest marker No.
- The markers may not indicate the exact position of the bumper, the vehicle's width or the distance to the rear. USE AS REFERENCE ONLY.



< >

CCD camera installation conditions
(distance marker input conditions)



Marker No (Pattern)	Camera Install Height	Vehicle Width
P1	2.000	2.500
P2	2.250	2.300
P3	2.500	2.300
P4	2.750	2.300
P5	3.000	2.300
P6	3.250	2.300
P7	3.500	2.500

(Unit mm)

(From bumper toward rear)

Vehicle width

MARKER SELECT

P1 7M
P2 5M
P3 3M
P4 1M

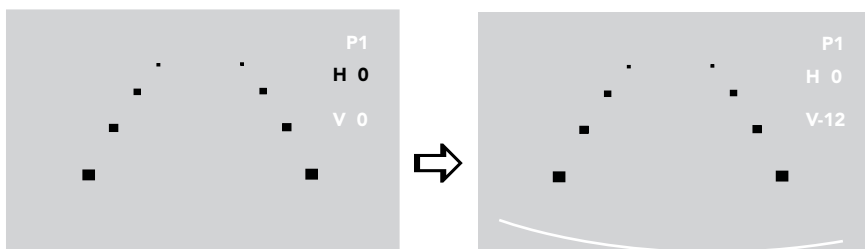
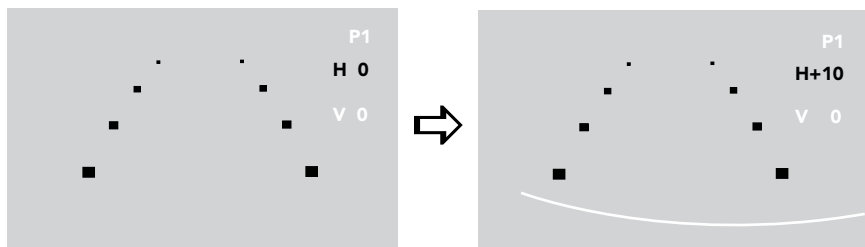
Bumper position

FUNCTIONS AND OPERATIONS

3. MARKER ADJUSTMENT (ADJUSTING THE BUMPER POSITION)

- Press "Mode" button 5 times, select MARKER ADJUST from the menu.
- Press $\wedge \vee$ button, select H/V. (H: horizontal, V: vertical)
- Press $\langle \rangle$ button, and switch marker patter.
- (H= -10~ +10, V= -12~ +12, Default setting: H=0, V=0)
- After 10 seconds, set up screen disappears, and set up finishes.

* If there is no button operation, set up screen disappears even during set up process



TRIGGER INPUT

1. SCREEN SWITCH WHILE TRIGGER INPUT

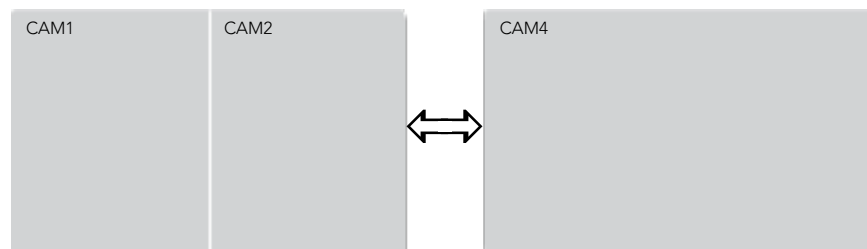
What is "Trigger Input" or "Trigger Signal"? This is when a circuit send s signal to the monitor showing connected camera on screen during driving mode.

(ex. if driver uses left/right turn signal or reverse gear.)

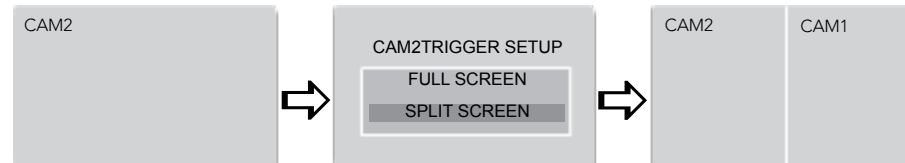
- *Example below is set with TRG1(Rear light) = CAM1
- TRG2(Left Signal) = CAM2
- TRG3(Right Signal) = CAM3
- TRG4(ETC.) = CAM4

FUNCTIONS AND OPERATIONS

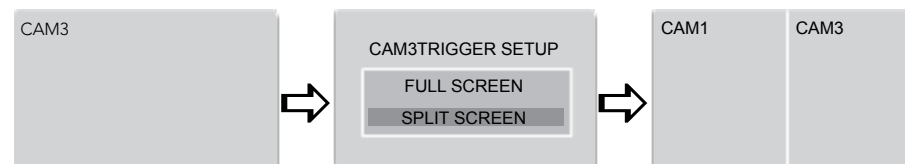
2. If there is trigger input, the connected screen (Trigger input screen) is displayed as full screen and the screen goes former one when the signal disappear.



3. In case of TRG2 and TRG3 input, by the OSD, the full or split screen could be selected. If there is the TRG2(3) signal input, then CAM2(CAM3) and CAM1 split screen are shown on the screen. With this function, Left (Right) and Rear side could be checked.



In CAM2 full screen, press the "Mode" button to see OSD. Select split screen with $\wedge \vee$ button and then press \rangle button. If there is the left signal input (TRG2), then CAM2 (Left) in left side and CAM1 (Rear) in right side will be shown on the screen.

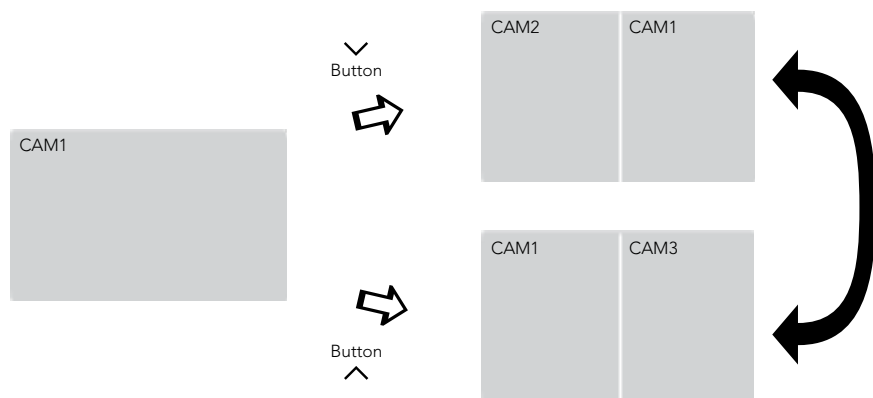


In CAM3 full screen, press the "Mode" button to see OSD. Select split screen with $\wedge \vee$ button and then press \rangle button. If there is the left signal input (TRG3), then CAM1 (Rear) in left side and CAM3 (Right) in right side will be shown on the screen.

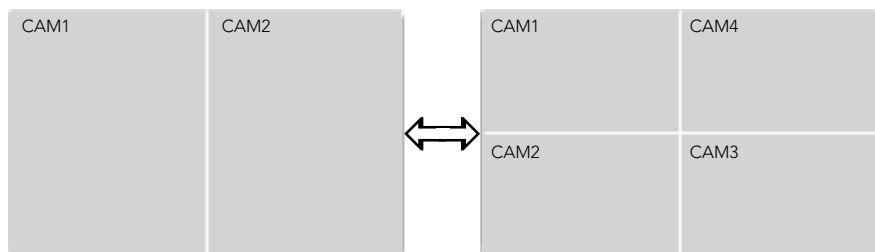
4. When there is the TRG1(Rear light) input, CAM1 video will be shown on the screen. with $\wedge \vee$ button, the 2 split screen CAM2/CAM1 or CAM1/CAM3 could be displayed.

FUNCTIONS AND OPERATIONS

5. When there is the TRG1(Rear light) input, CAM1 video will be shown on the screen. with $\wedge \vee$ button, the 2 split screen CAM2/CAM1 or CAM1/CAM3 could be displayed.



6. In case of light on emergency blinker (TRG2+TRG3), the monitor display CAM1~CAM4 as quad split screen. And the screen goes former one when the signal (light on emergency blinker) is disappeared.



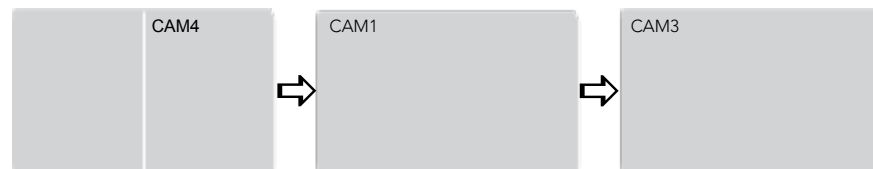
i The example is set with TRG1(Rear light)=CAM1 / TRG2(Left signal light)=CAM2 / TRG3(Right signal light)=CAM3 / TRG4(etc)=CAM4.

FUNCTIONS AND OPERATIONS

7. When there is input signal more than 2 triggers, the monitor display fully connected screen (Trigger input screen) as the priority order. And the screen goes former one when the signal is disappears, the rest will be display as the priority order.

TRIGGER PRIORITY ORDER

TRG1(Rear light) > TRG2+3(Emergency light) >
TRG2(Left side light) > TRG3(Right side light) > TRG4



- * If the screen turns by trigger signal, the POWER, MENU & MODE buttons are disabled.
- * In the standby position if the trigger wire is activated the monitor will turn on. The screen will turn off once the power is de-activated to the trigger wire. The screen will then turn off when the trigger signal has gone off.

SETTINGS

VIDEO SYSTEM

1. NTSC/ PAL conversion

Press the "MODE" button until OSD menu "PICTURE SETUP" appears.

Press $\wedge \vee$ button to select "VIDEO SYSTEM" and use $\>$ to enter selection.

If using PAL system on NTSC system using county, it may cause a malfunction. The product can convert NTSC / PAL system manually but it is not automatic. Before use, Please check and set the system.

- * NTSC system country: USA, CANADA, JAPAN, KOREA, TAIWAN, MEXICO, etc.
- PAL system country : AUSTRALIA, GERMANY, U.K., NETHERLANDS, ITALY, etc.

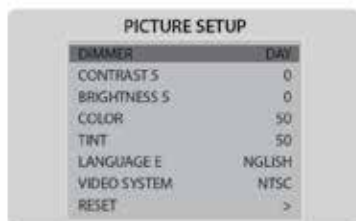
DIMMER

2. Dimmer sensor setting

Press the "MODE" button until OSD menu "PICTURE SETUP" appears.
Press $\wedge \vee$ button to select "DIMMER" and use $\langle \rangle$ to enter selection.

Press the "DAY/NIGHT" button to switch DAY >> NIGHT >> AUTO >> DAY

* Dimmer is set AUTO from the factory

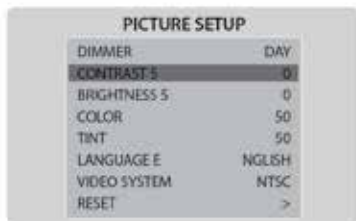


PICTURE

3. PICTURE SETUP

Press the "Mode" button until OSD menu "PICTURE SETUP" appears.
Press $\wedge \vee$ button to select changes and use $\langle \rangle$ to adjust value.

* Each factory setting is preset to 50.



LANGUAGE

4. LANGUAGE DISPLAY SELECTION

Press the "Mode" button until OSD menu "PICTURE SETUP" appears.
Press $\wedge \vee$ button to select changes and use $\langle \rangle$ to adjust value.

* Language selection: ENGLISH - FRENCH - GERMAN - ITALIAN - SPANISH



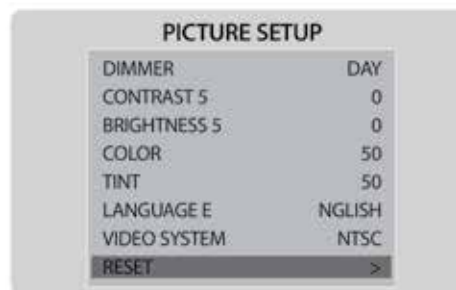
SETTINGS

FACTORY SETTINGS

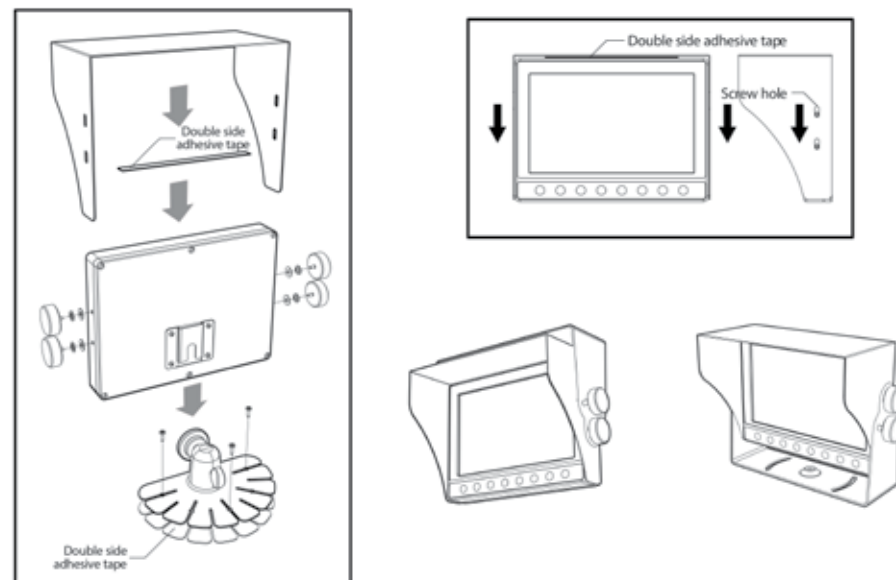
5. Reset

- Press the "MODE" button until OSD menu "PICTURE SETUP" appears.
- Press $\wedge \vee$ button to select "RESET" and use \rangle to enter selection.

* All settings are initialized at the factory mode except for the video input. (NTSC/PAL)

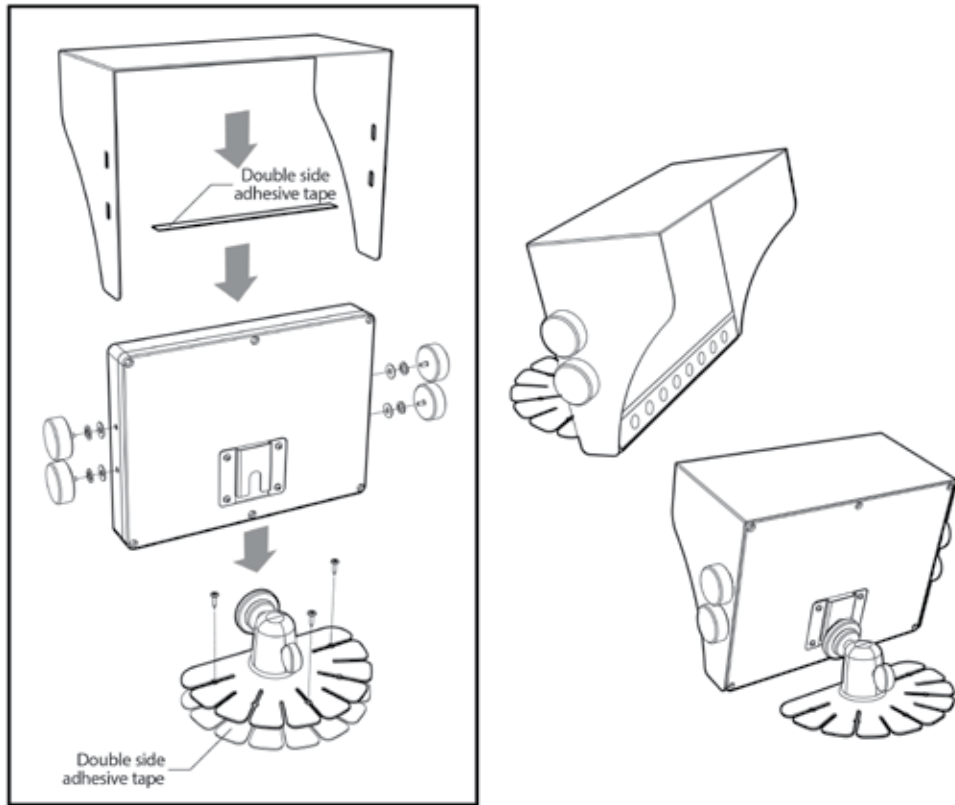


INSTALLATION OF U-BRACKET



1. Ensure that the monitor is installed with enough room for heat emission. Install the monitor stand with enclosed screws and double side adhesive tape as shown in the above image.
2. Fix the monitor to the monitor stand firmly.
3. Sun Visor should be installed with 4 screws.

INSTALLATION OF DUCKMOUNT



1. Ensure that the monitor is installed with enough room for heat emission. Install the monitor stand with enclosed screws and double side adhesive tape as shown in the above image.
2. Fix the monitor to the monitor stand firmly.
3. Sun Visor should be installed with 3 screws.

CONNECTION

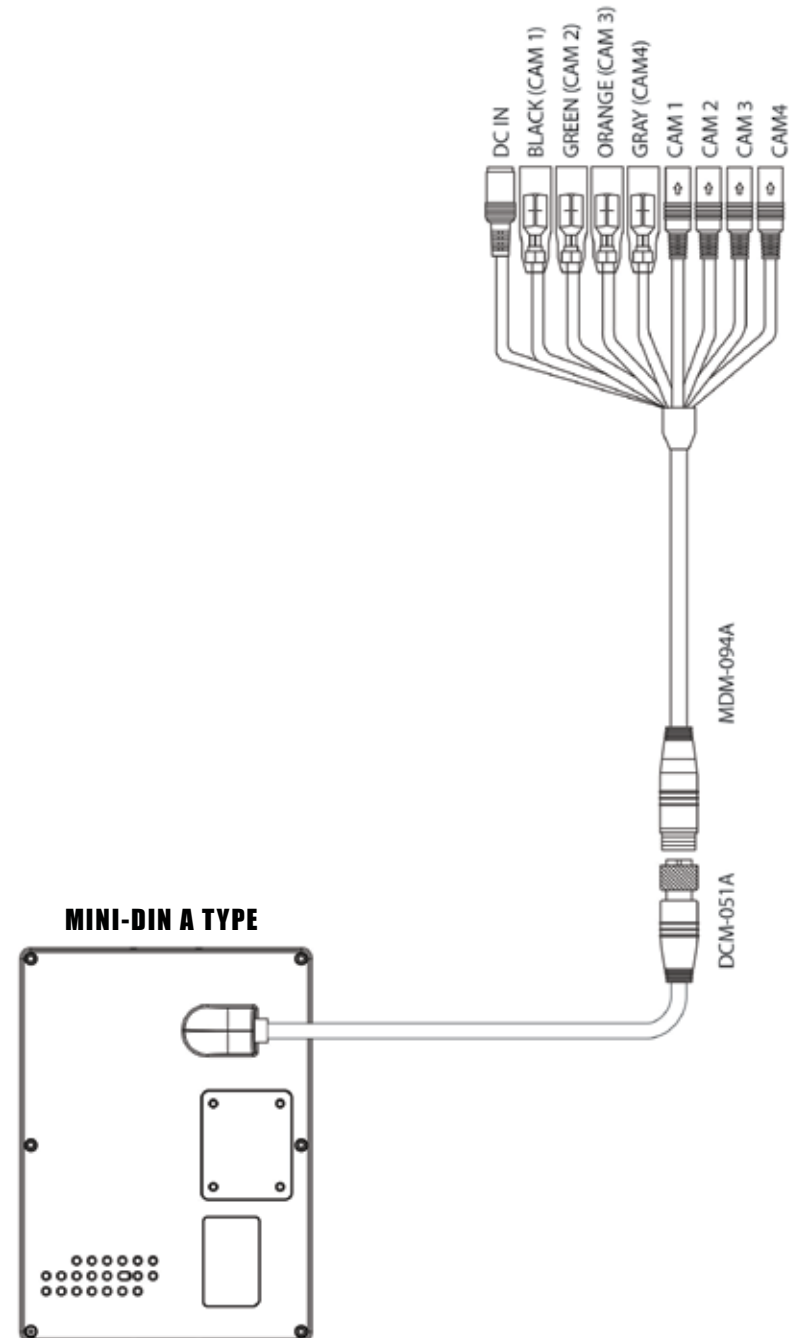


FIG. 1

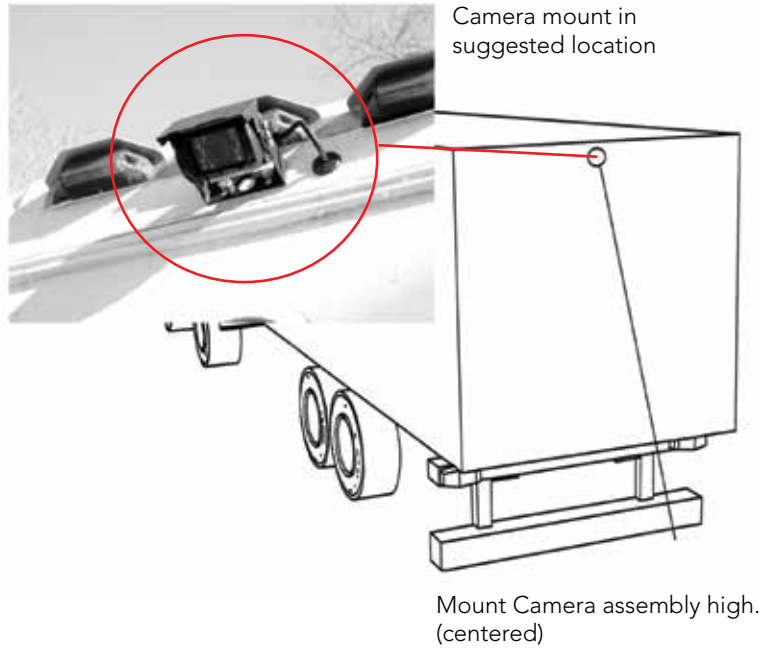
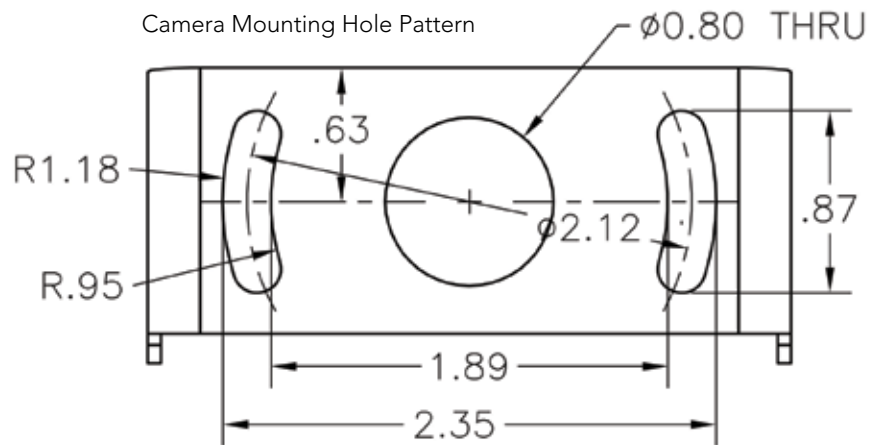
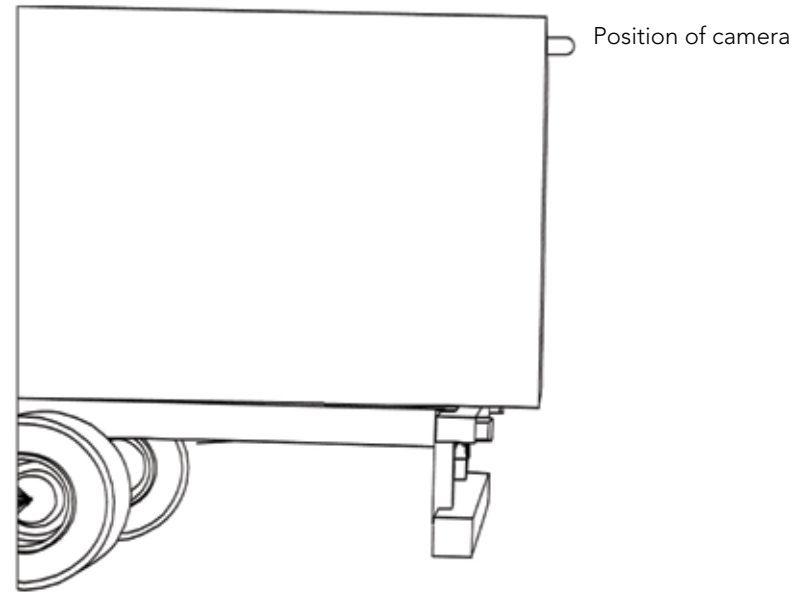
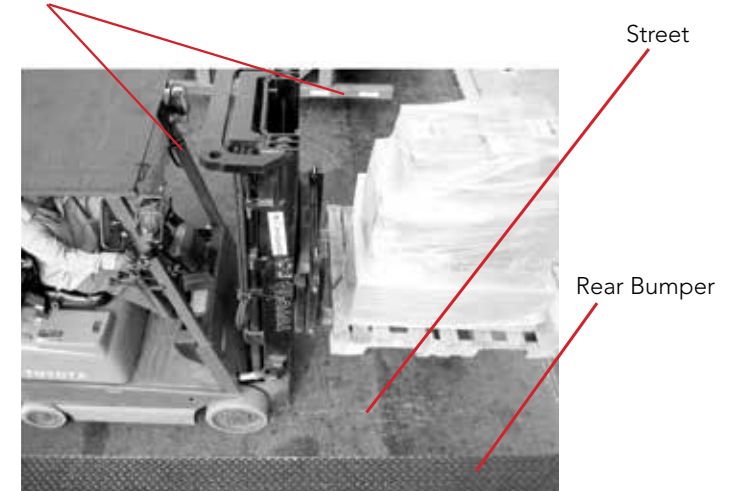


FIG. 2



Vehicles behind truck



Typical monitor image of view from properly installed camera

FIG. 3

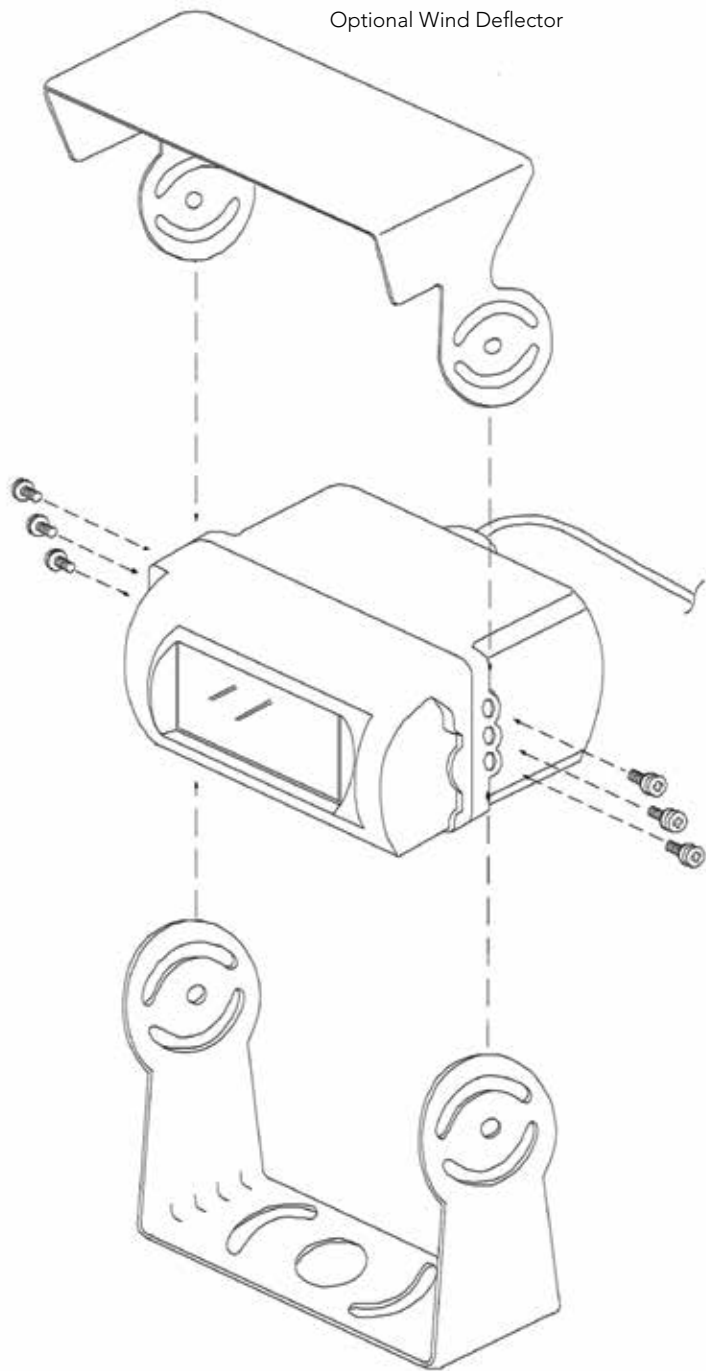
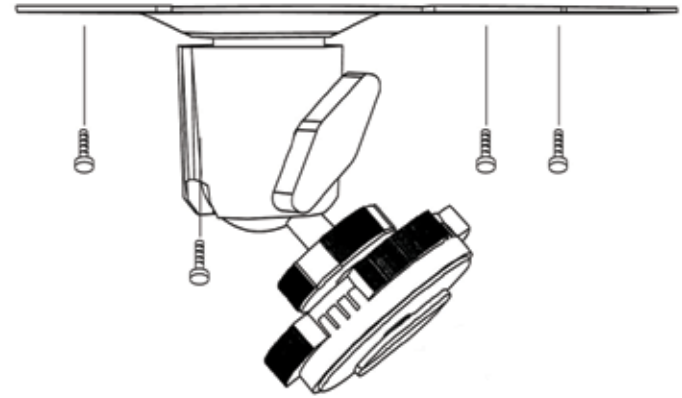


FIG. 4

Mounting on ceiling



Mounting on the dash, console etc.

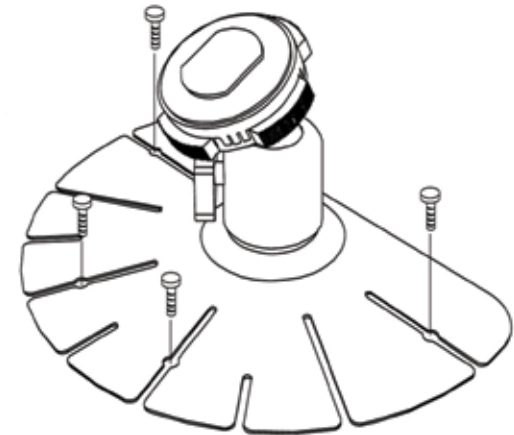
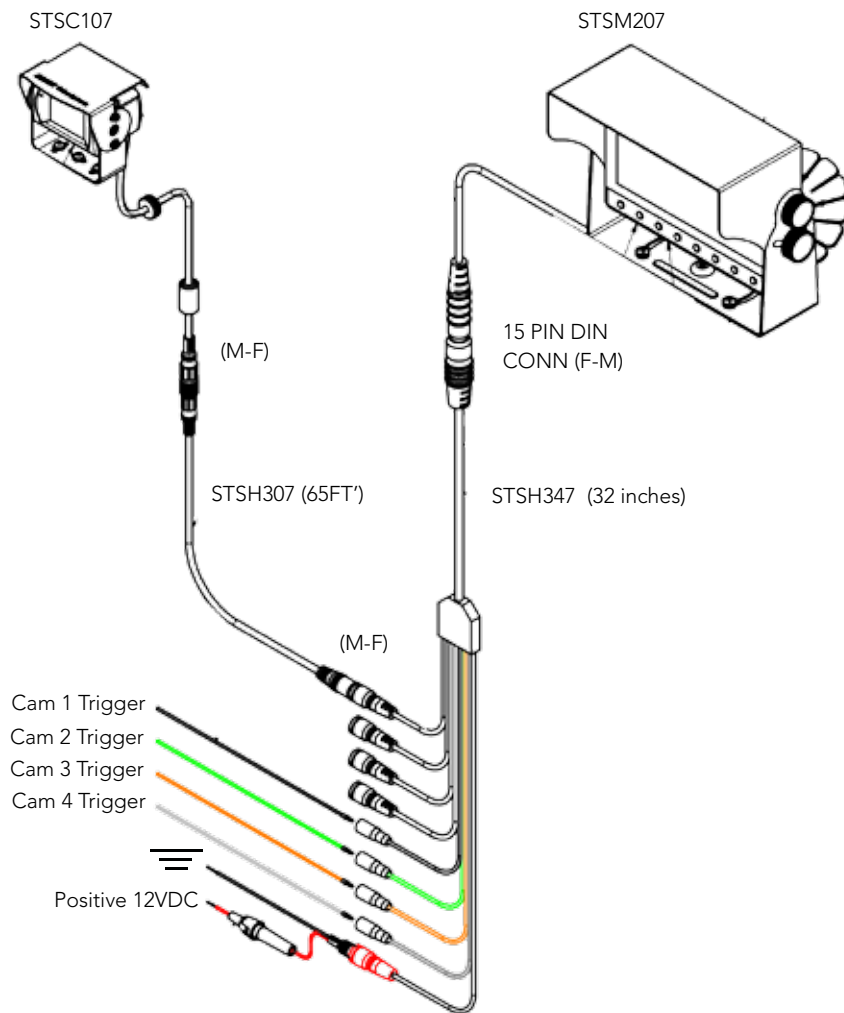


FIG. 5



NOTES

* Black wire is the reverse trigger wire, connect to vehicle backup light circuit. Monitor will turn on when the vehicle shifts into reverse.

Note: For typical single camera installation, this trigger wire should be connected to the vehicle's "back up lights" circuit, and the rear-view camera should be attached to the connector marked "REVERSE"



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