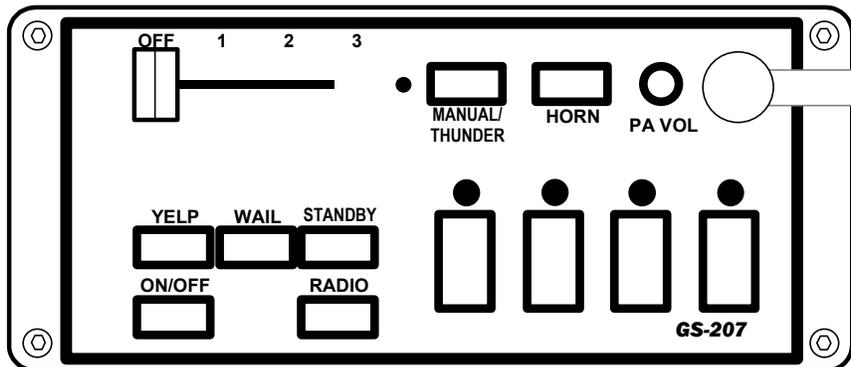
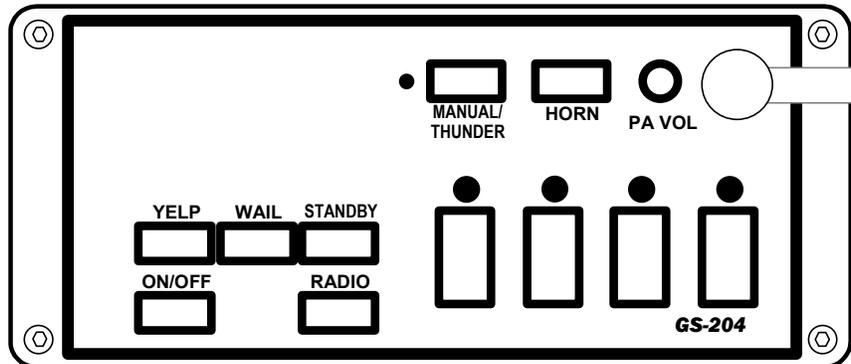


CARSON

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TECHNICAL BULLETIN



INSTALLATION AND OPERATING MANUAL

GS-204/207-01 14V

GS-204/207-01 28V

Carson is a trademark of Carson Manufacturing Company, Inc.

WARNING



Sound Hazard - Sound level from siren speaker (>120dBA @ 10 feet) may cause hearing damage. Do not operate siren without adequate hearing protection for you and anyone in immediate vicinity. (Ref. OSHA 1910.95 for occupational noise exposure guidelines)

GS-204/207-01 SPECIFICATIONS

AMPLIFIER INPUT POWER:	9-16 Volts DC, 8 Amps DC per 100W Speaker (14V Unit) 18-32 Volts DC, 4 Amps DC per 100W Speaker (28V Unit)
SIREN MODE	
OUTPUT POWER:	15 VDC input, 100W speaker(s) (14V Unit) 30 VDC input, 100W speaker(s) (28V Unit) One speaker – 105 Watts RMS Two speakers - 180 Watts RMS
AUDIO MODE	
OUTPUT POWER:	14 VDC input, 100W speaker(s) (14V Unit) 28 VDC input, 100W speaker(s) (28V Unit) One speaker – 40 Watts RMS Two speakers - 80 Watts RMS
SIREN	
FREQUENCY:	700Hz - 1450Hz Nominal
CYCLE RATES:	WAIL - 15 cycles/min YELP - 205 cycles/min THUNDER - 100 cycles/min
AUDIO	
RESPONSE:	200Hz - 10KHz +/-3db Harmonic Distortion Less than 3% @ 1KHz (14V Unit) Harmonic Distortion Less than 7% @ 1KHz (28V Unit)
RADIO INPUT	
SENSITIVITY:	0.75VAC Input Min. for 40 Watts RMS Output (1 spkr)
OPERATING	
TEMPERATURE:	-15° F to +140° F
SIZE:	6" Wide X 2-5/8" High X 6" Deep
WEIGHT:	5.5 pounds
NIGHT VISIBILITY:	Backlit front control panel when power is on
AMPLIFIER PROTECTION:	High Voltage – Siren output stops with input voltage above highest rating Stops high output power from blowing speaker Reverse Polarity - Fuse blows when power is wired backwards Shorted Output – Fuse blows if speaker shorts (a common problem)
LIGHT CONTROL INPUT POWER:	9-16 Volts DC, 120 Amps Max. not including siren input current. (GS-207) 60 Amps Max. not including siren input current. (GS-204)
LEVER SWITCH OUTPUTS:	30 Amps Max. per circuit, 60Amps Max. Total. (GS-207 only)
FOUR AUXILIARY OUTPUTS:	30 Amps Max. per circuit, 60Amps Max. Total.
LIGHT CONTROL PROTECTION:	None.

NOTICE

Due to continuous product improvements, we must reserve the right to change any specifications and information, contained in this manual at any time without notice.

Carson Manufacturing Co., Inc. makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Carson Manufacturing Co., Inc. shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

INSTALLATION

Proper installation of the unit is essential for years of safe, reliable operation. Please read all instruction **before** installing the unit. Failure to follow these instructions can cause serious damage to the unit or vehicle and may void warranties.

SAFETY PRECAUTIONS

For the safety of the installer, vehicle operator, passengers and the community please observe the following safety precautions. **Failure to follow all safety precautions and instructions may result in property damage, injury or death.**

Qualifications - The installer must have a firm knowledge of basic electricity, vehicle electrical systems and emergency equipment.

WARNING



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Mounting - Mount the unit for easy access by the vehicle operator. DO NOT mount in air bag deployment area. Assure clearances before drilling in vehicle.

Wiring - Use wiring capable of handling the current required. Make sure all connections are tight. Route wiring to prevent wear, overheating and interference with air bag deployment. Install and check all wiring before connection to vehicle battery.

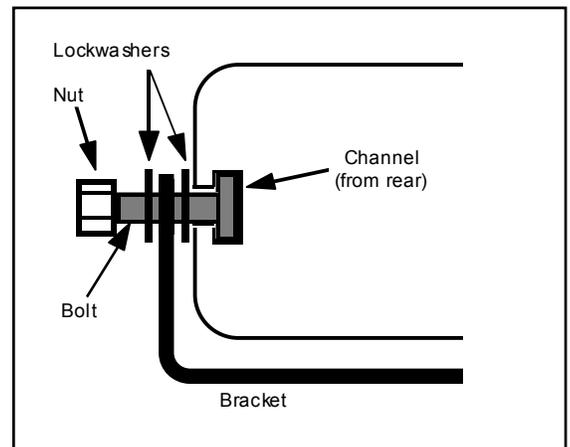
Testing - Test all siren functions after installation to assure proper operation. Test vehicle operation to assure no damage to vehicle.

Keep These Instructions - Keep these instructions in the vehicle or other safe place for future reference. Advise the vehicle operator of the location.

MOUNTING

The mounting bracket supplied can be installed above or below the unit. Mounting bolts (standard 1/4-20) slide into channels on each side of the case. Lockwashers should be used between the case and bracket as well as between the bracket and nut. Choose a mounting location convenient to the operator and away from any air bag deployment areas. Inspect behind mounting area for clearance. Assure adequate ventilation to prevent overheating. Consider wire routing and access to connections, as well as microphone bracket placement. Install mounting bracket to vehicle using 1/4" hardware (not supplied).

A microphone clip along with mounting screws (CP3633) holds the microphone in place



INSTALLER-SELECTABLE OPTIONS

Carefully cutting programming resistor jumpers on the printed circuit board inside the case can select various options.

Accessing Program Options: Remove the front panel by removing 4 corner screws with a 7/64" allen wrench. Observe polarity of the microphone connector. When replacing the front panel re-install the microphone connector, observing polarity and clearance for backlighting.

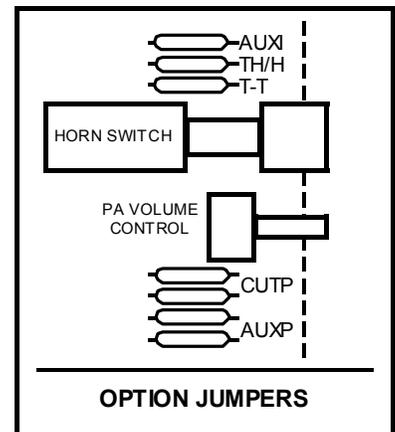
Auxiliary Input Function - The auxiliary input normally activates the Horn function. To activate the Manual/Thunder function with the auxiliary input cut the resistor jumper labeled "AUXI".

Auxiliary Input Polarity - The auxiliary input is normally activated by connecting to positive. To activate by connecting to ground cut the two resistor jumpers labeled "AUXP".

Cutout Input Polarity - The cutout input is normally activated by connecting to positive. To activate by connecting to ground cut the two resistor jumpers labeled "CUTP".

Two-Tone - Two-Tone can replace Thunder by cutting the resistor jumper labeled "T-T".

Thunder/Horn Disable - The Thunder and Horn functions can be completely disabled by cutting the resistor jumper labeled "TH/H".



ELECTRICAL CONNECTIONS

Disconnect vehicle battery before making any electrical connections.

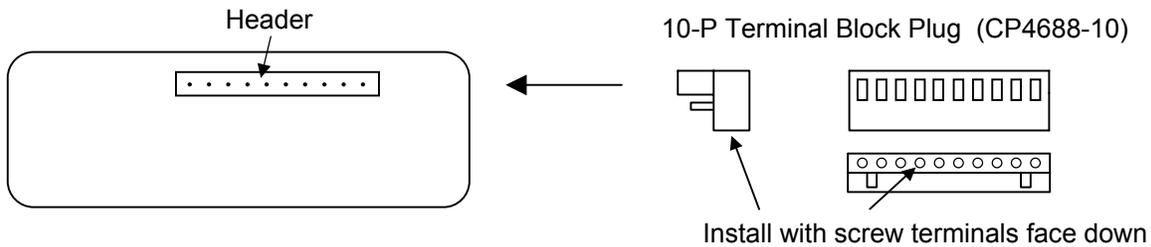
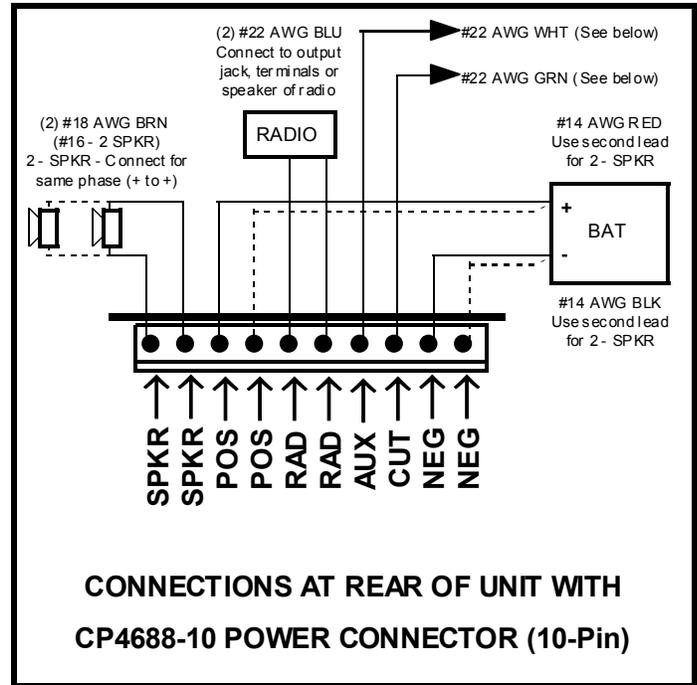
Siren Connections

Electrical connections to the siren section are made using a removable terminal block plug located on the back. A label on the unit identifies the terminal function. You should install the connector on the unit before wiring. If the unit needs service the connector can be easily removed without unwiring the connector.

The power supply of the unit must be capable of delivering peak currents up to 50 amps for adequate short circuit protection and reliable operation. The preferred source is directly at the vehicle battery. The siren section is fused on the back.

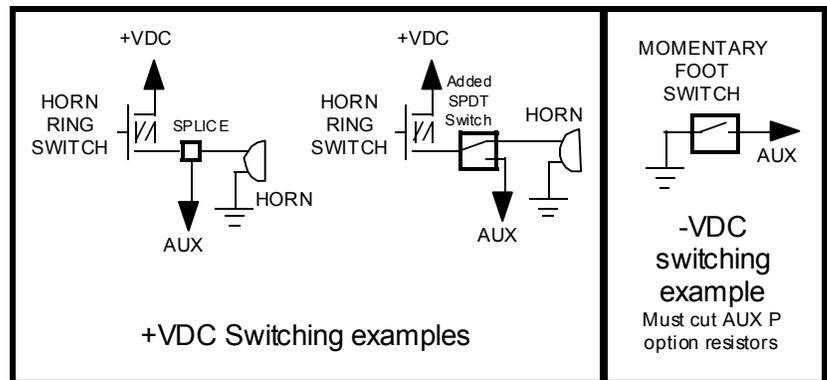
Attach leads by stripping 3/8", inserting into connector and clamp by tightening screw. Make sure the screw is tight and the wire can't be pulled out. **Failure to adequately tighten the screw can result in improper operation or burning the connector and wire.**

Wire Size and Termination - The diagram shows the minimum wire size used for each connection, along with recommended lead color. If the wire is longer than 10 ft. use the next larger wire size. Use only high quality crimp connectors for installation on the vehicle.

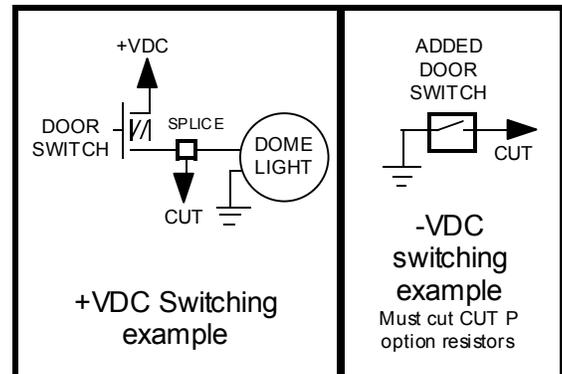


Auxiliary Input Connection - The Auxiliary Input allows activation by an external source of either the Horn or Man/Thdr function. The adjacent diagram shows three connection examples. See the INSTALLER-SELECTABLE OPTIONS section for programming details.

NOTE: Permanent disconnection of the vehicle horn is NOT recommended.



Cutout Input Connection - The Cutout Input turns off any siren tone output when activated, and remains off until a control is activated or changed. The adjacent diagram shows two connection examples. See the INSTALLER-SELECTABLE OPTIONS section for programming details.



Light Control Connections

In addition to these instructions a label located on the bottom of the unit shows the light control switch connections.

Fuses / Breakers

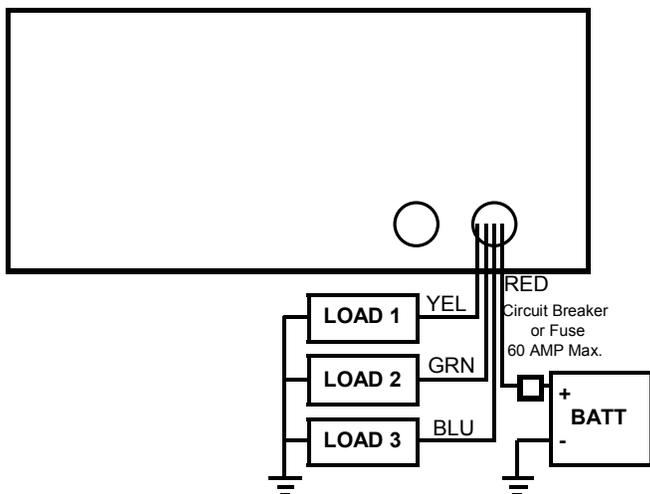
The lighting control circuits of this unit **are not fused**. Automotive fuses or circuit breakers must be connected between the power source and the unit properly rated for the circuit requirements. **Failure to install proper circuit breakers or fuses can result in damage to the unit and/or vehicle.**

Lever Switch Connections (GS-207 only)

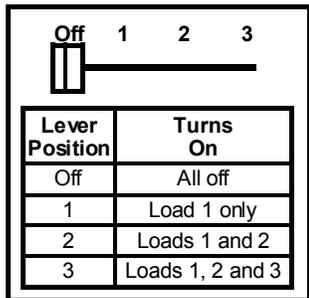
The following diagram shows proper connection of the lever switch leads located at the rear.

NOTE: EVEN IF LEVER SWITCH CONNECTIONS ARE NOT USED, THE RED LEAD MUST BE CONNECTED TO POSITIVE FOR PROPER SIREN OPERATION. ISOLATE AND INSULATE REMAINING LEADS.

Note: Negative (NEG) connection must also be made on 10-Pin connector for proper operation.



Recommended Wire Size	
Amps	Size
5 - 10	#16
10 - 15	#14
15 - 25	#12
25 - 40	#10
40 - 60	#8
60 - 80	#6
Use next larger size if longer than 10 ft.	



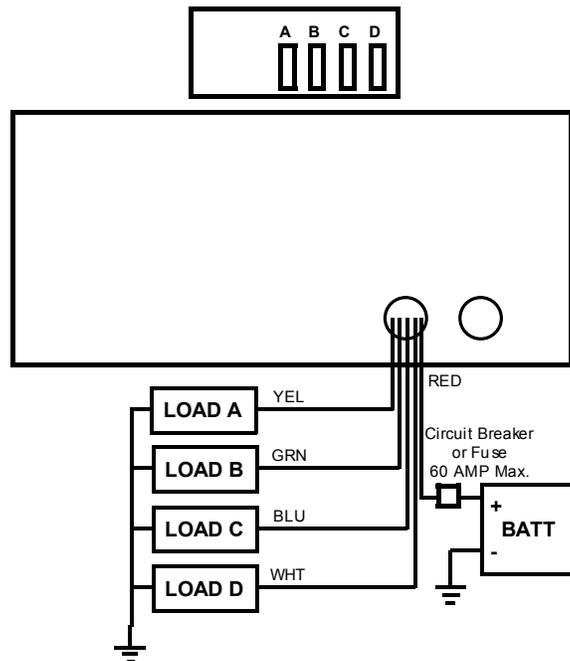
Light Control Rocker Switch Connections

The following diagram shows proper connection of the rocker switch leads located at the rear.

WARNING: The lighting control circuits of this unit **are not fused**. Automotive fuses or circuit breakers must be connected between the power source and the unit properly rated for the circuit requirements. **Failure to install proper circuit breakers or fuses can result in damage to the unit and/or vehicle.**

NOTE: EVEN IF ROCKER SWITCH CONNECTIONS ARE NOT USED, THE RED LEAD MUST BE CONNECTED TO POSITIVE FOR PROPER SIREN OPERATION. ISOLATE AND INSULATE REMAINING LEADS.

Note: Negative (NEG) connection must also be made on 10-Pin connector for proper operation.



Recommended Wire Size	
Amps	Size
5 - 10	#16
10 - 15	#14
15 - 25	#12
25 - 40	#10
40 - 60	#8
60 - 80	#6
Use next larger size if longer than 10 ft.	

OPERATION

WARNING



Sound Hazard - Sound level from siren speaker (>120dBA @ 10 feet) may cause hearing damage. Do not operate siren without adequate hearing protection for you and anyone in immediate vicinity. (Ref. OSHA 1910.95 for occupational noise exposure guidelines)

SIREN CONTROLS

SELECTOR SWITCHES

Five push-button switches control the primary operating function of the siren.

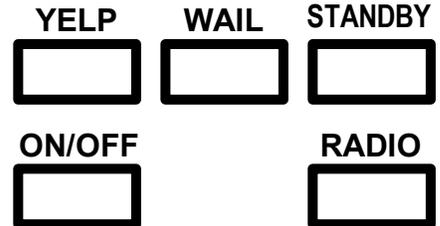
Yelp - A rapidly changing tone used in congested areas.

Wail - A slower changing tone used on highways.

Standby - A silent mode that allows Manual, Horn and Public Address operation.

On/Off - Controls siren power.

Radio - Also known as Radio Repeat, this function amplifies a radio speaker input for re-broadcast outside the vehicle. No siren tones or PA operation are available in this position.

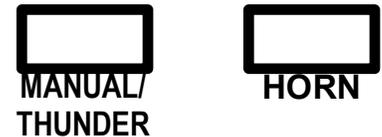


MANUAL/THUNDER

This momentary push-button switch provides a very rapid changing tone (Thunder) when the selector switches are in the Yelp or Wail positions. This tone is used at intersections and very highly congested areas. Pressing the button once changes to the Thunder tone and pressing again changes the tone back to Yelp or Wail.

With the selector switches in the Stby position this switch provides Manual siren tone control, rising when pressed and falling when released. This is used to momentarily alert motorists or in low noise areas.

Optional operation includes replacement of the Thunder tone with Two-Tone or disabling the Thunder tone entirely. These options are selected during installation. (TH/H option.)



HORN

This momentary push-button switch provides a simulated air-horn tone while pressed. This can be used to supplement the normal vehicle horn and is useful at intersections or in low noise areas. This tone will override all other siren tones. This function may be disabled during installation and may be governed by State or Local laws. (TH/H option.)

MICROPHONE

The attached noise-canceling microphone is used for public address operation and overrides any siren tone when the button on the side is pressed.

PUBLIC ADDRESS VOLUME

A volume control is provided for public address volume. This should be set when the vehicle is parked. Set the PA volume to the maximum level with no feedback (squeal).



RADIO VOLUME

Set the radio volume with the Radio switch on and the radio volume set to the desired level. Use a small screwdriver inserted into the radio adjust hole shown to adjust the volume to the desired level.



AUXILIARY INPUT

During installation an auxiliary input may be connected to the horn ring or other switching device. It provides the same operation as pressing the Horn button or optionally the Manual/Thunder button.

CUTOUT

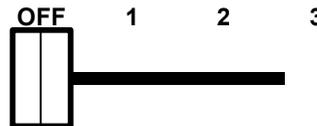
During installation, a cutout input may be connected to a door switch. It turns off any siren tone when the door is opened. The siren tone will continue to be cut off even when the door is closed. Operating any switch or input will restore normal function.

LIGHT SYSTEM CONTROLS

This unit provides durable switches and power relays for light control function. A 4-position lever switch provides control of primary lighting functions. It also provides automatic activation of the siren system. Setting the siren control switch to the On position can turn on backlighting of the light control switches.

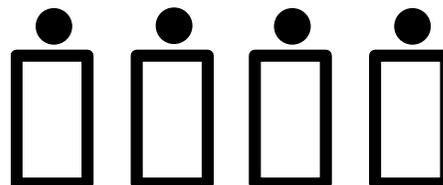
Lever Switch (GS-207 only)

The lever switch provides additive control of lighting functions. Position 1 turns on a single lighting function, such as lights pointing to the rear. Position 2 turns on an additional light function, such as lights pointing to the front. Position 3 turns on an additional 3rd lighting function, such as strobes. The installer determines actual function. Position 3 also turns on a siren function (see Automatic Siren below).



Rocker Switches

Four rocker switches are provided for various other lighting functions, such as alley lights, deck lights, headlight flashers, etc. Indicators light when turned on for night use. On GS-204 the left most rocker switch also turns on a siren function (see Automatic Siren below).



Automatic Siren

Position 3 of the lever switch (or left rocker on GS-204) provides automatic siren control. With the siren selector switches set to Wail/Off the unit will activate the Wail siren tone. With the siren selector switches set at Yelp/Off the unit will activate the Yelp siren tone. The Man/Phsr and Horn switches will operate as if the siren control switches were set at the corresponding positions. PA override is also functional. Automatic siren operation will not work if the Radio switch is on or the installer has disabled the function.

SERVICE

This unit is designed to provide years of reliable service under even the worst conditions. Many times there may appear to be a problem with the unit when the true problem is in the speaker(s) or improper installation. The following chart shows typical symptoms and possible causes.

A blown **siren** fuse doesn't necessarily mean that the unit is bad. If a speaker or speaker lead is shorted this fuse will blow before the unit is damaged. Disconnect the speaker leads and replace the fuse. If the siren emits a sound when in the Yelp position it is OK. Check the speaker(s) or leads for possible shorting.

PROBLEMS

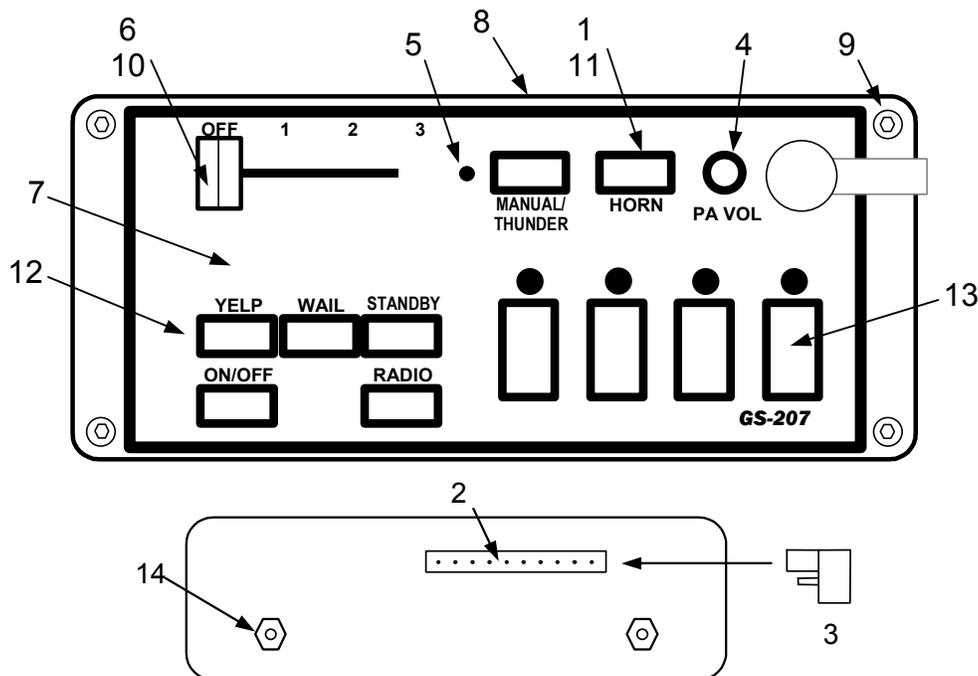
Symptom	Possible Cause	Check
No Power or siren output	Power switch not turned on Bad Speaker Connector or connections loose Rear panel fuse blown Loose connection at power source	Does backlighting come on? Do you hear a "pop" when turned on? With siren on, yelp selected, listen for tone in amplifier. Is an external fuse or circuit breaker used? Are the power leads connected to a good buss?
No siren tone – PA works	High Voltage Protection Mic Button stuck Cutout activated Cutout Polarity Option set wrong	The input voltage must be less than highest rating. Does Mic Button release properly? Does the siren work when Cutout input is disconnected? Is the CUTP option properly configured?
No PA	PA volume not set properly Radio switch on	Try turning the PA volume control. PA is not available when Radio is on.
Distorted siren sound	Speaker assembly loose Intermittent Aux input connection Low Vehicle voltage	Is the speaker bell or tip loose? Is the Aux input used and wired properly? The input voltage must be greater than lowest rating.
Intermittent siren tone	High Voltage Protection Connector or connections loose Bad Power connection Mic Button Activation Circuit breaker in supply connection	Is the vehicle voltage regulator working properly? Is the connector tight on the back of the unit? Is there a loose connection on a power lead? Is something lying on the microphone? Is a circuit breaker used with at least 50A rating?
Horn function stuck on or Manual/Thunder stuck on	Horn switch stuck Manual/Thunder switch stuck Aux input improperly connected Aux input Polarity option set wrong	Does the Horn switch return fully when released? Does the Manual/Thunder switch return fully when released? Is the Aux input used and wired properly? Is the AUXP option properly configured?
No Radio	Unit not connected to a radio Radio volume too low	Is the radio connected properly to the unit? Can you hear the radio in the vehicle? Try adjusting the unit radio volume control.
Wrong siren tone	Two-Tone option installed Aux input set to wrong function	Is the T-T option jumper cut? Is the AUXI option jumper configured properly?
Thunder and Horn not working	Thunder/Horn disabled	Is the TH/H option jumper cut?
Automatic Siren not working	Selector in Radio position Automatic Siren disabled	Siren tone is not available in Radio position. Has the function been disabled by the installer?
Automatic Siren in all lever switch positions	No power to red lever switch lead No power to red rocker switch lead	Do the light controls turn on devices? Check for power at red lead for lever & rocker switch.
Lever switch not working in all positions	No power to red lever switch lead No ground at siren connector	Do the lever switch indicators light? Check for power at red lever switch lead.
Lever switch not working in some positions	Loose lever switch output connection on lead	Does the lever switch indicator light?
Lever switch output stays on	Internal relay contacts fused from overheating	Is the output current exceeding 30AMPS?
Rocker switch outputs not working	No power to rocker switch Loose rocker switch output connection on lead	Is the corresponding fuse blown? Does the rocker switch indicator light turn on?

RETURN

If you have any questions concerning this or any other Carson product, please contact our **Technical Service Department** at (888) 577-6877. Many issues can be handled over the phone. We can also be reached via e-mail at service@carson-mfg.com

If a product must be returned for any reason, please contact our Technical Service Department to obtain a Returned Merchandise Authorization number (RMA#) before you ship the product to Carson. Please write the RMA# clearly on the package near the mailing label. Be sure to provide a return address, contact and phone number, along with a brief description of the problem.

PARTS



Item	Part #	Description
	CP3571	Bracket, mounting
1	CP4729	Button, gray (for pushbutton switches)
2	CP4687-10	Connector, 10-P header
3	CP4688-10	Connector, 10-P terminal block plug
4	CP4730	Control, volume, PA (1K ohm)
5	CP4732	Control, volume, Radio (1K ohm)
	CP4726	Cover, extruded (does not include Front Panel or slide out Chassis)
	ATO/ATC 20A	Fuse, 20A Automotive
6	CP4700	Knob, lever switch, red (substitute CP4960 black knob)
	CP4734	Label, front panel (GS-204)
7	CP4728	Label, front panel (GS-207)
	CP4750	Microphone, Noise Canceling w/ Connector
	CP3633	Microphone clip with mounting screws
	SR-15-1	Microphone strain relief
8	CP4727	Panel, front
9	CP4759-CV-06	Screw, 3/8" #6-32 black socket head (8 required)
	CP4701	Relay, 14V, 40A SPST light control (for 14V Unit)
	CP4701-1	Relay, 28V, 40A SPST light control (for 28V Unit)
10	CP4699	Switch, lever
11	CP4685	Switch, pushbutton, Horn or Man/Thdr
12	CP4731	Switch, pushbutton X5 (YELP – WAIL – STANDBY - ON/OFF – RADIO)
13	CP4733	Switch, rocker, Aux light control
14	CP4119	Transistor, output (2 required) (Industry standard TIP36C, Not Texas Instruments)
	ED1602	Kit, Hardware (Terminal block plug, Mic clip with mounting screws, 1/4-20 bolts, nuts, and lockwashers)