

FUSION[®]

PERFORMANCE



**PERFORMANCE
AMPLIFIER MANUAL**

**PF-1802 PF-4001D PF-4004
PF-8003D PF-8001D**

AMPLIFIER SPECIFICATIONS

	PF-1802 (2 Channel)	PF-4004 (4 Channel)
Class	Class-AB	Class-AB
Power	1200 Watts	2400 Watts
Frequency Response	20Hz - 20kHz	20Hz - 20kHz
Dimensions	246mm (9-11/16") x 200mm (7-7/8") x 51mm (2")	386mm (15-3/16") x 200mm (7-7/8") x 51mm (2")
RMS Power Ratings	65W x 2 @ 4 Ohms 1% THD+N 90W x 2 @ 2 Ohms 1% THD+N 180W x 1 @ 4 Ohms Bridged 1% THD+N	80W x 4 @ 4 Ohms 1% THD+N 100W x 4 @ 2 Ohms 1% THD+N 200W x 2 @ 4 Ohms Bridged 1% THD+N
Signal to Noise Ratio	>50 dB	>50 dB
High and Low Pass Crossover	12dB per Octave	12dB per Octave
Bass Boost @ 45Hz	0 - +18dB	N/A
Crossover Range	50Hz - 400Hz	50Hz - 400Hz
Low Level Input Range	0.35 Volts to 10 Volts	0.35 Volts to 10 Volts
High Level Input Range	1 Volt to 30 Volts	1 Volt to 30 Volts
Minimum load impedance	2 Ohm stereo and 4 Ohm bridged	2 Ohm stereo and 4 Ohm bridged

	General
Power Requirements	+12 V DC (negative ground)
Operating Voltage	10.5 - 16V
Minimum Recommended-Power/Ground Cable Size	4 Gauge (AWG)
Recommended inline fuse size	4 Gauge Cable - 80A

NOTE:
PERFORMANCE
AMPLIFIER SERIES
HAVE A MINIMUM
LOAD IMPEDANCE
OF
2 OHM PER
CHANNEL
4 OHM BRIDGED

	PF-4001D (Monoblock)	PF-8001D (Monoblock)	PF-8003D (3 Channel)
Class	Class-D	Class-D	Class-D
Power	1600 Watts	3200 Watts	2400 Watts
Frequency Response	10Hz - 250Hz	10Hz - 250Hz	10Hz - 20kHz
Dimensions	236mm (9-1/4") x 200mm (7-7/8") x 51mm (2")	306mm (12") x 200mm (7-7/8") x 51mm (2")	306mm (12") x 200mm (7-7/8") x 51mm (2")
RMS Power Ratings	250W x 1 @ 4 Ohms 1% THD 400W x 1 @ 2 Ohms 1% THD	500W x 1 @ 4 Ohms 1% THD 800W x 1 @ 2 Ohms 1% THD Link Mode (Two PF-8001D) 1600W x 1 @ 4 Ohms 1% THD	Front 90W x 2 @ 4 Ohms 150W x 2 @ 2 Ohms 1% THD+N Sub 230W x 1 @ 4 Ohms 500W x 1 @ 2 Ohms 1% THD+N
Signal to Noise Ratio	>50 dB	>50 dB	>50 dB
High and Low Pass Crossover	12dB per Octave	12dB per Octave	12dB per Octave
Subsonic Filter	12dB per Octave	12dB per Octave	12dB per Octave
Low Pass Crossover Range	50Hz - 250Hz	50Hz - 250Hz	50Hz - 250Hz
Subsonic Crossover Range	10Hz - 40Hz	10Hz - 40Hz	10Hz - 40Hz
Bass Boost @ 45Hz	0 to +18dB	0 to +18dB	0 to +18dB
Low Level Input Range	0.35 Volts to 10 Volts	0.35 Volts to 10 Volts	0.35 Volts to 10 Volts
High Level Input Range	1 Volt to 30 Volts	1 Volt to 30 Volts	1 Volt to 30 Volts
Minimum load impedance	2 Ohm	2 Ohm and 4 Ohm in Link mode	2 Ohm

AMPLIFIER INSTALLATION

INSTALLATION WARNINGS

1. Ensure the +12V lead is disconnected from the battery before you connect any new equipment.
2. Ensure that the amplifier mounting location and holes will not interfere with the gas tank, brake lines or electrical wiring.
3. Ensure the amplifier is securely fastened to the vehicle to prevent the amplifier moving and causing damage in the event of an accident.
4. Ensure all wiring is protected from sharp objects and from pinching or crushing which could result in damage to the audio system.
5. Ensure the mounting location has sufficient air flow around the amplifier. If the amplifier is mounted in an enclosed space a 3" fan with ducting should be used to assist with cooling.
6. Do not mount any amplifier on a subwoofer enclosure as extended exposure to vibration may cause damage to the amplifier.
7. Ensure you use the minimum recommended gauge wire/cable or larger for all amplifier connections.
8. Appropriate mounting is very important for prolonged life expectancy of any amplifier. Select a location that provides protection from moisture. Keep in mind that an amplifier should never be mounted upside down. Upside down mounting will compromise heat dissipation through the heat sink and could engage the thermal protection circuit.

CONNECTION

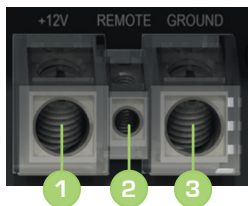
Ensure the audio system is turned off before making any connections to the amplifier, speakers or source unit. Failure to do so could result in permanent damage to the audio system.

Ensure the correct gauge cable is used for all connections; consult the cable calculator diagram below for the correct gauge cable for your installation.

TOTAL AMPS	CABLE LENGTH >	M	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 9
		FT	0- 4	4 - 7	7 - 10	10 - 13	13 - 16	16 - 19	19 - 22	22 - 28
0 - 20			14	12	12	10	10	8	8	8
20 - 35			12	10	8	8	6	6	6	4
35 - 50			10	8	8	6	4	4	4	4
50 - 65			8	8	6	4	4	4	4	2
65 - 85			6	6	4	4	2	2	2	0
85 - 105			6	6	4	2	2	2	2	0
105 - 125			4	4	4	2	0	0	0	0
125 - 150			2	2	2	0	0	0	0	0

The above chart shows cable gauges to be used, if no less than a 0.5 volt drop is acceptable. If aluminium wire is used, the gauges should be of an even larger size to compensate. Cable gauge size calculation takes into account terminal connection resistance.

AMPLIFIER CONNECTIONS



PF-1802 PF-4001D PF-4004 PF-8003D PF-8001D

Avoid running any cables near engine components or heater cores. An inline fuse or circuit breaker **MUST** be used within 30cm (12") of your battery; this will prevent the potential risk of a fire caused by a short in your power cable (see specifications table for recommended inline fuse / circuit breaker ratings). Connect the other end of your power cable to the battery, but remember to leave the fuse out or circuit breaker off until all other cable connections are made.

2. REMOTE TURN ON

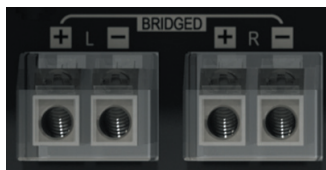
This connection turns the amplifier on and should be connected to the "Remote turn on" wire from the Head Unit. If one is not available, a switched +12v source must be used, such as a power antenna wire or ACC +12v.

If you are using high level (speaker) inputs and a remote turn on wire is not available, then the amplifier "Auto Turn On" feature can be used instead of this wire. Set the "Auto Turn On" switch to audio.

3. GROUND

Connect the Ground/Earth cable for your amplifier first. Ensure that the location is a good source of ground (preferably the chassis / floor pan). Investigate the area you wish to use to ensure it is free from wiring, vacuum lines, brake and fuel lines. Use either a wire brush or sandpaper to expose bare metal, this will provide a high current contact for your ground connection. Use the same gauge cable for the ground cable as you did for the power cable. Secure the ground cable to the ground point with a bolt, star washer and nut. Apply some neutral cure silicon to the bolt and bare metal to prevent possible water leaks and rust.

Connect the other end of your ground cable to the amplifier.



PF-1802

1. +12V POWER

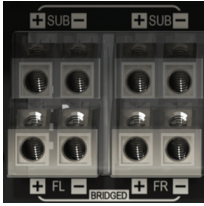
Ensure **ALL** other cable connections are completed before connecting this cable to the battery. FUSION amplifiers should be connected directly to the 12v battery terminal using the appropriate gauge cable. Start at the vehicles battery and run the cable through to the amplifier. FUSION recommends the use of rubber grommets when passing any cable through metal panels to avoid sharp corners or panels that could cut through the insulation of the cable.

4A. SPEAKER OUTPUT CONNECTION

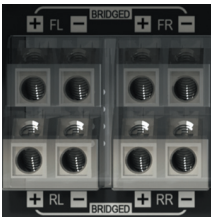
Ensure the correct polarity is observed when connecting speakers/subwoofers.

2 Ohm minimum speaker impedance for stereo operation (per channel)

4 Ohm minimum speaker impedance for Bridged operation.



PF-8003D



PF-4004

4B. INTERNALLY LINKED OUTPUT (PF-8003D) - COILS IN PARALLEL

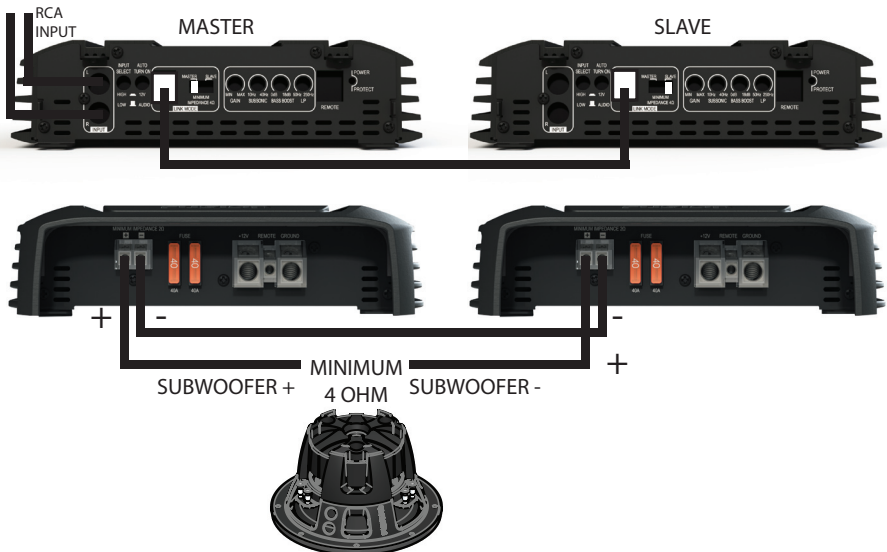
The PF-8003D amplifier provides dual output connections for the subwoofer to simplify wiring when using two subwoofers or a dual voice coil subwoofer. Both positive and negative subwoofer terminals are internally connected or linked in parallel. For dual coil (2 x 4 Ohm) or two single coil (4 Ohm) subwoofers, connect each coil to a positive and negative terminal. For a standard single coil subwoofer connect to either positive and either negative terminal.

4C. BRIDGED CONNECTION (PF-1802, PF-8003D AND PF-4004)

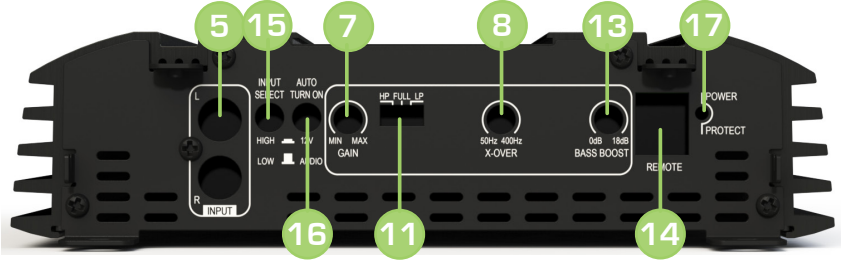
By connecting a speaker or subwoofer to the positive terminal of one channel and the negative of the other channel, you are combining the output of two channels into one. This gives you higher output levels as noted in the specifications but you must observe the minimum load impedance as failure to do so will result in damage to the amplifier.

LINK MODE (PF-8001D)

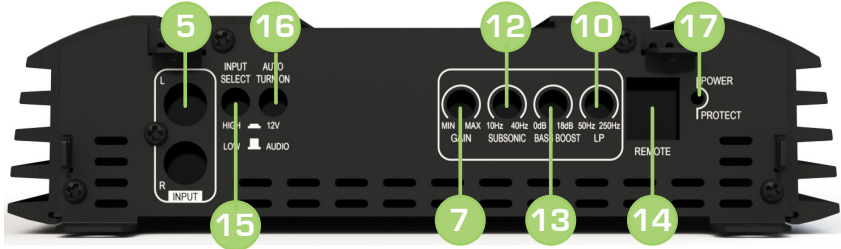
This allows two PF-8001D amplifiers to be bridged to produce double the output power @ 4 Ohms. Do not connect a lower impedance speaker load as this could cause damage to the amplifier and void the products warranty. The PF-8001D amplifier must be installed and linked with the supplied Data cable. The amplifier that has the RCA input connected from the source (head) unit must be set to "Master". This amplifier has control of all settings and the second amplifier must be set to "Slave". The subwoofer must be wired following the diagram below and the minimum speaker impedance is 4 Ohms.



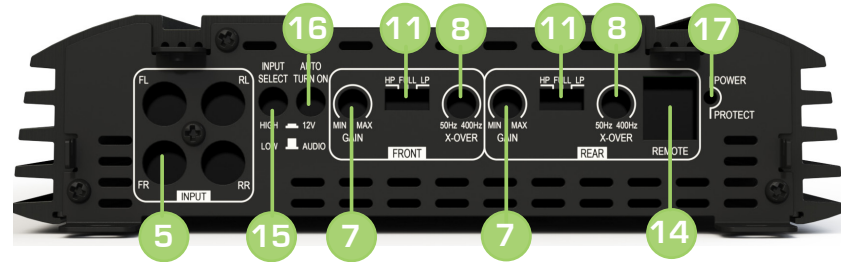
AMPLIFIER CONTROLS



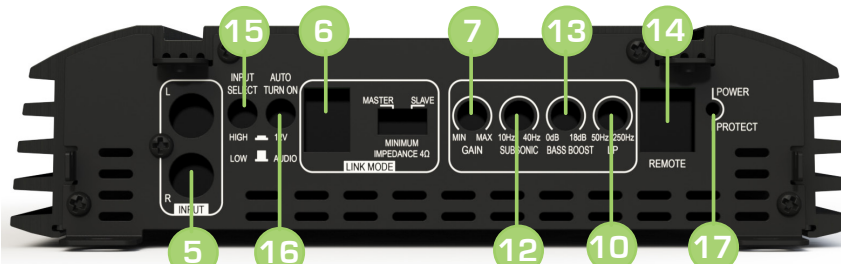
PF-1802



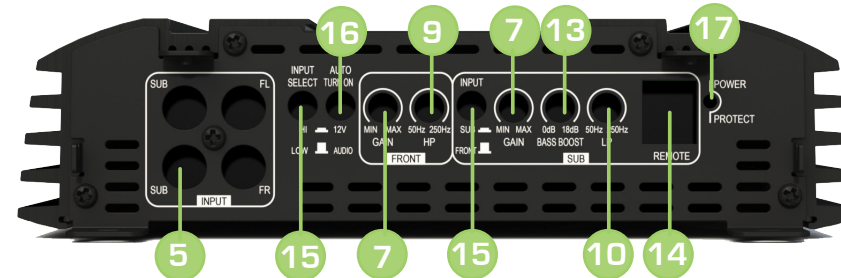
PF-4001D



PF-4004



PF-8001D



PF-8003D

5. LOW LEVEL RCA INPUTS FRONT-REAR-SUBWOOFER

Choose the correct length RCA cables to connect the RCA outputs of the source/head unit, to the input connectors of the amplifier. Run the RCA cables on the opposite side of the vehicle to the power cable and vehicle wiring loom. Avoid the electric fan motor and wiring. Ensure you follow the correct balance. (L Left = White or Black. R Right = Red).

6. LINK MODE (PF-8001D ONLY)

This function allows two PF-8001D amplifiers to be installed and linked with the supplied Data cable. Refer to page 5 for more information

7. GAIN/LEVEL CONTROL (FRONT-REAR)

This control is used to match the input level of the amplifier to the output level of your head unit. We recommend the method below, as failure to follow these steps may damage the audio system.

1. Turn the amplifier Gain to zero
2. Turn the volume of the head unit to $\frac{3}{4}$ and the bass and treble to zero
3. Adjust the amplifier Gain/Level control until the desired maximum volume is achieved without distortion.
4. Make fine adjustments to tune your install.

8. X-OVER (PF-1802 AND PF-4004 ONLY)

This is the adjustable frequency range setting for the two filter options - High Pass and Low Pass.

9. HIGH PASS CROSSOVER FILTER

When a subwoofer is used in the system, this feature is designed to filter out all low bass frequencies that only subwoofers should produce. See specification table for adjustable frequency range. Set the crossover switch (1 1) to HP.

10. LOW PASS CROSSOVER FILTER

Ensure the crossover frequency is set at 100Hz or below. This feature must be used with a subwoofer to filter out all mid to high frequencies that only full range speakers should produce. See specification table for adjustable frequency range. Set the crossover switch (1 1) to LP.

11. HIGH PASS - FULL RANGE - LOW PASS CROSSOVER SWITCH

High Pass

See Note 9

Full Range

Set the crossover switch to full range, this setting is for large speakers (e.g. 6 X 9") or speakers when a subwoofer is not included in the system. The amplified audio signal is not filtered so the full range audio signal is sent to the speakers.

Low Pass

See Note 10

12. SUBSONIC FILTER (PF-4001D AND PF-8001D ONLY)

This is a variable control that filters out all subsonic bass frequencies below the set point. These are frequencies that are not audible. These frequencies can damage subwoofers. See specification table for adjustable frequency range.

13. BASS BOOST (PF-1802, PF-4001D, PF-8001D AND PF-8003D)

This control adjusts the bass boost at 45Hz, from 0 to +18dB. Start from 0 and slowly increase to the desired level. Use this control with extreme care as failure to do so may result in damage to the subwoofers.



14. REMOTE

This connection should be used with the optional remote control (CA-RLC13 - sold separately) to adjust the bass level from any location within the vehicle.

15. INPUT SELECT

This function switches the amplifier input between Low level (RCA cable) and High level (speaker wire) connection. Where possible RCA (Low Level) connections are preferable.

High

The High setting is selected when the FUSION CA-HIC13 High Level adaptor (sold separately) is used to connect a full range signal from the source (head) unit speaker connections to the amplifier. Simply connect the speaker wires to the input connections observing polarity and then connect the FUSION CA-HIC13 to the RCA inputs on the Amplifier.

Low

The Low setting is for RCA connection from the source (head) unit to the amplifier. Connect the RCA interconnects to the appropriate Line Out connectors on the source (head) unit and connect to the RCA inputs of the Amplifier.

This is the preferred installation method, as this provides a higher quality audio signal.

16. AUTO TURN ON

Auto Turn on switch = 12V

Select when a remote turn on wire is connected from the source (head) unit "remote wire" output or a 12V switched supply is used. Eg power antenna wire or ignition Accessory position. This is required when using the Low Level connection via RCA interconnects. It is optional when using High level inputs.

Auto turn on switch = AUDIO

This feature is available with the High Level input only and the (FUSION CA-HIC13 sold separately). The amplifier will turn on when the source (head) unit is powered on and Audio signal is supplied via the speaker wires to the amplifier. The remote turn on wire is not required in this installation.

FUSION recommends the use of the remote wire output from the headunit when available.

17. POWER / PROTECT LED

1. When illuminated Green, indicates normal operation. Amplifier is powered on with no faults detected.
2. When illuminated Red, indicates the amplifier is in protection mode / fault state.
See troubleshooting section on page 10.

CUSTOM INSERT

Supplied with your Performance series amplifier is a custom insert panel created from polycarbonate plastic. If replacing your insert with a customised design, ensure you replace with a similar material. Dimensions: Each insert is 1mm (0-1/16") thick and 62mm (2-7/16") wide. Insert lengths are shown below:

PF-1802 = 183mm (7-3/16"),

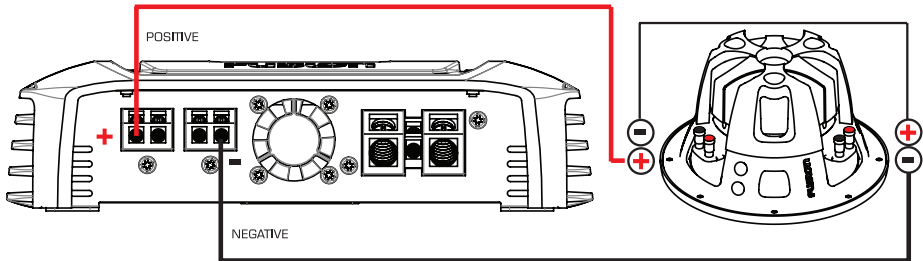
PF-4001D = 173mm (6-13/16"), **PF-4004** = 323mm (12-11/16"),

PF-8001D & PF-8003D = 243mm (9-9/16").

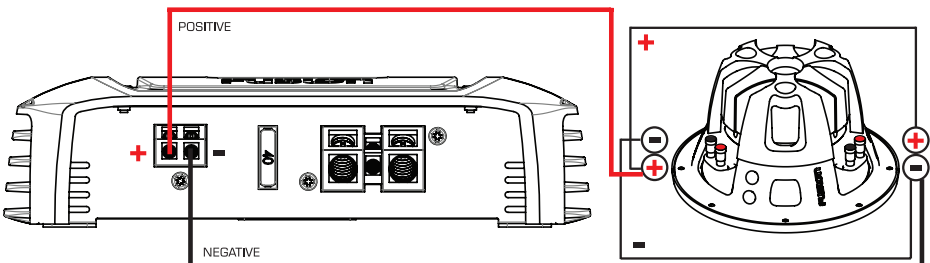


SUBWOOFER CONNECTION DIAGRAMS

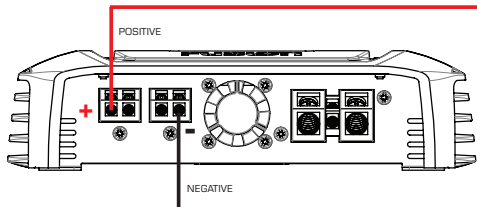
DUAL 2 OHM VOICE COILS WIRED IN SERIES = 4 OHM



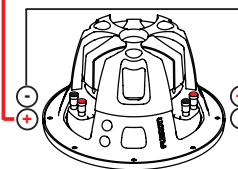
DUAL 4 OHM VOICE COILS WIRED IN PARALLEL = 2 OHM



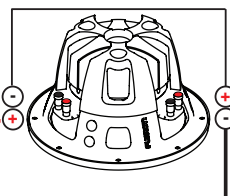
**2 X 4 OHM CONFIGURATION
WOOFERS IN PARALLEL = 2 OHM**



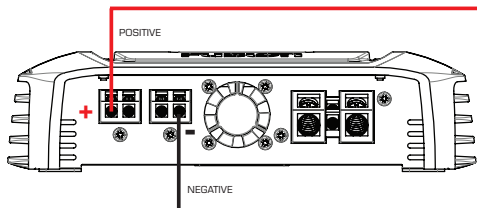
**DUAL 2 OHM VOICE COILS WIRED
IN SERIES = 4 OHM**



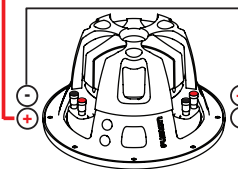
**DUAL 2 OHM VOICE COILS WIRED
IN SERIES = 4 OHM**



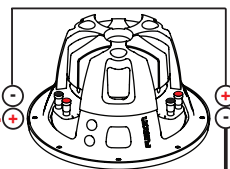
**2 X 8 OHM CONFIGURATION
WOOFERS IN PARALLEL = 4 OHM**



**DUAL 4 OHM VOICE COILS WIRED
IN SERIES = 8 OHM**



**DUAL 4 OHM VOICE COILS WIRED
IN SERIES = 8 OHM**



TROUBLESHOOTING

PROBLEM	POSSIBLE REASON	SOLUTION
Amplifier not switching on. LED = OFF (not 'Red or Green')	• No +12V to power wire	• Check fuses and connections to battery
	• No power to remote wire	• Check Remote Turn ON connection(s) to head unit
	• Fuse broken	• Replace fuse with correct type and amperage
	• No Ground connection	• Check ground cable is correctly connected to the amplifier and vehicle / body chassis
Amplifier not working, status LED = Red	• Amplifier too hot	• Move amplifier to vented area • Turn head unit down
	• Speaker wires shorted	• Check that there are no speaker wires shorted to another wire or to the vehicle chassis
No sound LED = Green	• RCA Signal	• Check RCA connection to head unit
	• Gain control not set up	• Ensure you have set up the amplifier gain level control
	• Head Unit	• Check head unit volume level
	• Amplifier	• Check all power, remote on and ground connections
	• Speakers	• Check speakers are correctly connected. • Check speakers for wire shorts