

JBL
POWERTM
series



Power Series Amplifiers

P-7520, P-7540, P-2510 Owner's Manual

GENUINE JBL

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Thank you for purchasing your new JBL Power Series™ amplifier. Power Series amplifiers feature the latest advances in discrete-circuit topology, ensuring low distortion and superbly clean and clear sound quality. In addition to RCA-type pre-amp inputs, Power Series amplifiers feature Universal Interface™, designed to facilitate integration with factory-installed audio systems for distortion-free performance that rivals conventional pre-amp connections. Included in the Universal Interface circuit is Common Sense™ turn-on. Common Sense turn-on senses the common-mode voltage present on the speaker outputs of factory and aftermarket radios, turning on the amplifier without a separate remote wire. All Power Series amplifiers feature built-in electronic crossovers and pre-amp outputs for easy system expansion without requiring outboard processors.

Amplifier Features

- 4-, 3- or 2-channel operation (P-7540), 2- or 1-channel operation (P-7520), mono Class-D subwoofer channel (P-2510)
- Simultaneous stereo and mono operation (P-7520, P-7540)
- Built-in 12dB/oct variable electronic crossover
- Balanced differential input
- Front and rear summing inputs (P-2510) for non-fading bass
- Pre-amp outputs with crossover (P-7520, P-7540)
- Oversized Floating Rail Mosfet Power Supply
- Universal Interface
- Common Sense turn-on
- Variable Input Sensitivity (250mV–4V)
- Fully complementary, direct coupled discrete power amplifier circuitry
- Ultraefficient Class-D subwoofer amplifier (P-2510)
- Gold-plated power, input and output connectors
- 2-Ohm stable (stereo)
- JBL badge lights when amp is operating and flashes when protection circuit is activated
- Made in USA

About This Manual

To attain maximum amplifier performance, we encourage you to read the remaining pages before installing and operating your new JBL Power Series amplifier. Especially review the Applications section for ideas on designing and expanding your system. Also, save these instructions for future reference. **Important:** Installation of automotive stereo components can require extensive experience in performing a variety of electrical and mechanical procedures. Although these instructions explain how to install a JBL Power Series amplifier in a general sense, they do not show the exact installation methods for your particular vehicle. If you do not have the experience, do not attempt the installation yourself; instead ask your Authorized JBL Car-Audio Dealer about professional installation options.

Installation Precautions and Notes

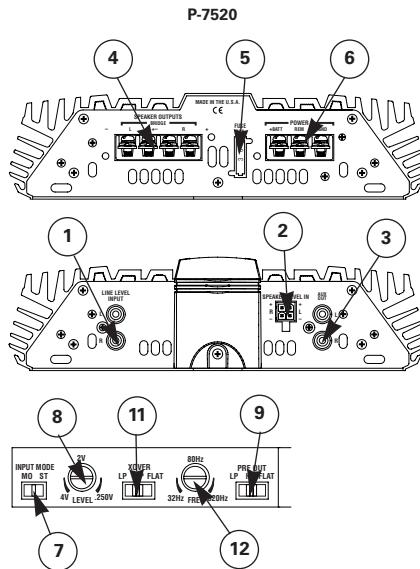
The JBL Power Series amplifiers have five levels of circuit protection that monitor the amplifiers and will shut them down if the electrical-system voltage drops below 5Vdc or exceeds 18Vdc, temperatures are above 194° F (90° C), short circuits occur or current draw exceeds product specifications. For best performance, check the intended mounting site to make sure the operating environment does not create conditions that will trigger circuit protection.

- Prior to installation, turn off all audio systems and other electrical devices. Also disconnect the (–) negative lead from the vehicle's battery.
- At the installation site, locate and make a note of all fuel lines, hydraulic brake lines and electrical wiring. Use extreme caution when cutting or drilling in and around these areas.
- Check clearances on both sides of a planned mounting surface before drilling any holes or installing any screws. Remember that mounting screws can extend behind the mounting surface.

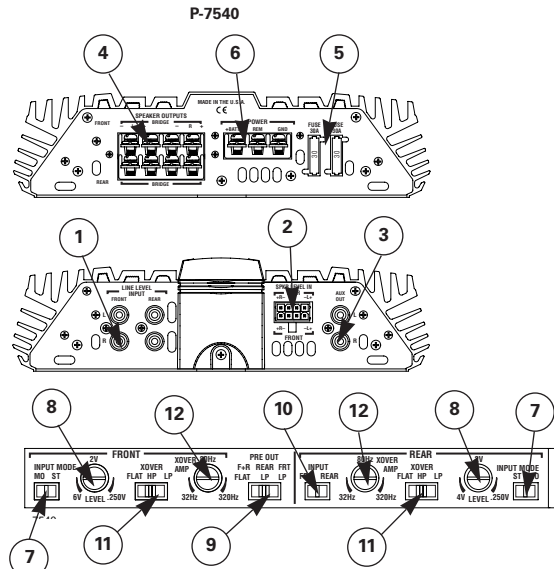
- Always wear protective eyewear when using tools.
- When routing cables, keep input signal cables away from power cables and speaker wires.
- When making connections, make sure that each connection is clean, insulated and properly secured. Observe the polarity markings on the rear panel. Refer to the application drawings to set up the amplifier for operation in stereo, bridged-mono, bi-amp or tri-mode configurations.
- If the amplifier's fuse must be replaced, use only the same rating and type as a replacement. Do not substitute another kind.

Controls and Connectors

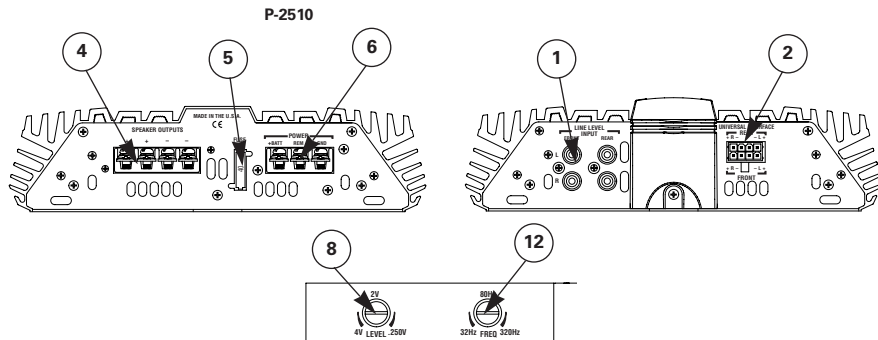
1. Pre-amp Level Input Connector – Connects to line-level output from the source unit.
2. Universal Interface Speaker Level Connector – Connects to speaker-level output from the source unit. Provides Common Sense amplifier turn-on when used with factory radios (2-channel on P-7520, 4-channel on P-7540).



3. Pre-amp Level Output Connector – Connects to other amps or processors in the signal chain.
4. Speaker-Output Connector – (2-channel on P-7520, 4-channel on P-7540).
5. Fuses – P-7520: 30A ATC type, P-7540: 30A ATC type x 2, P-2510: 40A ATC type.
6. Power Connector – Connection for 12V+, Gnd and Rem.
7. Input-Mode Switch – Sums left and right inputs.



8. Input Sensitivity Control – Adjusts input sensitivity for pre-amp level and speaker-level inputs.
9. Pre-amp Output Selector Switch – Selects input path for pre-amp output. Output can be summed from front and rear inputs with no filter, or filtered by the front or rear crossover.
10. Rear-Channel Input Selector – Selects rear-channel input between front input and rear input.
11. Crossover Selector – Determines whether the crossover is a High-Pass filter (HP), Low-Pass filter (LP) or unfiltered (flat).
12. Crossover Frequency Control – Determines the crossover frequency for the amplifier channels (front or rear) and the pre-amp outputs.



FREQUENCY Crossover	INDUCTOR 6dB/oct. LP (4 ohm)	CAPACITOR 6dB/oct. HP (4 ohm)
75Hz	8.0mH	530µF
100Hz	6.4mH	400µF
125Hz	5.0mH	318µF
150Hz	4.2mH	265µF
175Hz	3.6mH	227µF
200Hz	3.2mH	198µF

Mounting the Amplifier

The JBL P-7520, P-7540 or P-2510 can be mounted in virtually any location inside the vehicle. However, make sure to keep the amplifier away from heater vents or ducts.

1. At the chosen site, use the amplifier as a mounting template and mark the locations of the four mounting holes.
2. Drill a small pilot hole at each marked location.
3. Mount the amplifier and securely tighten the mounting screws.

Wiring the Power Connections

Refer to diagrams on pages 3 and 4 for connector locations.

1. For power, remote and speaker wires, strip 1/4" off one end of each jacket to reveal bare wire for insertion into the barrier strip connectors.
2. Locate the 3-connection barrier strip labeled +Batt, Rem and Gnd. Connect a black wire (at least 10G) to the Gnd terminal and connect the other end to the nearest bare-metal chassis component. Then, connect a red wire (at least 10G) from the vehicle's +12-volt battery terminal to the +Batt terminal on the barrier strip. Finally, connect a blue wire (16G) to the Rem terminal on the barrier strip and connect the other end to the Rem output of the source unit. If you are using speaker-level inputs and speaker-level outputs from the source, disregard the previous instruction regarding the Rem terminal.

Wiring the Speaker Output Connections

1. Connect the speakers, observing proper polarity, to the speaker-output barrier strip on the amplifier using at least 16G high-quality speaker wire. (Note: The total impedance of the speakers connected to the outputs when the amp is driven in stereo must be at least 2 ohms. Because the P-2510 is a single-channel amplifier, the speaker connections on the barrier strip are wired in parallel inside the amp. The total impedance of the speakers connected to the P-2510 must be at least 2 ohms.)
2. If you are bridging the amplifier, connect the speaker wires to the terminals marked "bridge," observing proper polarity. (Note: The total impedance of the speaker system to be connected to the amplifier must be at least 4 ohms in bridge mode.)

3. If you are running either the P-7520 or the P-7540 in tri-mode (stereo and mono simultaneously to one or two pairs of satellite speakers and a sub-woofer), refer to the chart above to determine the capacitor and inductor values you'll need to route bass signals to the woofer, and midrange and high frequencies to the satellite speakers. These passive-crossover components will also ensure that the impedance of the speaker system doesn't drop below 2 ohms. The P-2510 should be used to drive woofers only as its bandwidth is limited to 20Hz – 320Hz.

Wiring the Input Connections

1. If you are using conventional RCA input connections and a source unit with output voltage less than 4V, simply plug the RCA plugs into the RCA jacks on the amplifier.

- If you are connecting the amplifier to a factory-installed source unit, or to a source unit that only has speaker-level outputs, connect the speaker outputs of the source to the speaker inputs on the amp, observing the following color-code:
 Front Left+: White
 Front Left-: White with black stripe
 Front Right+: Gray
 Front Right-: Gray with black stripe
 Rear Left+: Green
 Rear Left-: Green with black stripe
 Rear Right+: Purple
 Rear Right-: Purple with black stripe
 (Note: When using the Universal Interface speaker-level inputs and speaker-level outputs, the Rem terminal on the amplifier may be used as a remote output connection and will provide power to turn on other amplifiers and processors in the system.)
 (Note: The front and rear inputs on the P-2510 are summed to mono inside the amp, and will provide constant bass regardless of the position of source unit balance and fader controls.)
- If you are connecting your Power Series amplifier to a source unit with output voltage higher than 4V, connect the output signal wires of the source unit to the Universal Interface speaker inputs. Because the inputs have an impedance of 10K ohms, this connection will provide the best noise-free performance possible.

- In some systems it may be desirable to have two sources play simultaneously through the audio system. For instance, if you have a factory-installed radio in your car and you want to add an aftermarket CD player, you may connect the CD player to the RCA inputs of the amp, and the factory radio to the Universal Interface speaker inputs. (Note: Front and rear channels of the CD and radio must be driven into the front and rear inputs of the amplifier. Use Y adapters if necessary.) The Universal Interface circuitry will isolate the two signals from each other while allowing them to drive the amp simultaneously. Therefore, switching from one source to the other is as simple as turning the unused source off and the other on. (Note: You must connect the remote turn-on wire from the CD player to the Rem terminal on the amp. Install a diode in the remote line from the CD player as shown in the diagram on this page.)

System Setup and Adjustment Electronic Crossover

The electronic crossover in the P-7520, P-7540 and P-2510 should be used to route the appropriate signal to speakers intended to play only bass, midbass or midrange and treble frequencies. The crossover slope is 12dB/oct and the fre-

quency is variable from 32Hz – 320Hz.

Pre-amp Outputs

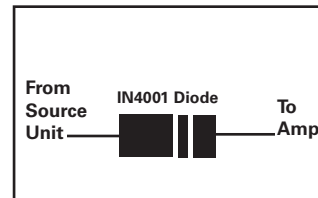
Connect these to the input connectors of other amplifiers or processors in your system.

The crossover-selector switch determines which filter will be assigned to the pre-amp outputs. The pre-amp outputs may be High Pass (switch set to HP), Low Pass (switch set to LP) or unfiltered (switch set to Flat). The crossover-frequency is determined by the crossover frequency control and will be the same frequency as the amplifier channels affected by that control.

Refer to the “Applications” section for system expansion possibilities.

Setting Input Sensitivity

Proper input-sensitivity control settings on Power Series amplifiers are critical to ensure optimum performance, low noise levels and maximum system reliability. As a general rule, controls at the front end of a system (source, equalizers and other processors) should be set as high as possible with the amplifier input sensitivity set as low as possible while still providing adequate volume levels. Using a high signal level and a low sensitivity setting will help keep background noise in the system to a minimum.



Initially, turn the input sensitivity GAIN control to its minimum (counterclockwise) position (refer to Figure 9).

- Reconnect the (-) negative lead to your vehicle's battery. Apply power to the audio system and play a favorite music track from CD or tape. (Note: After the source unit is on, the JBL badge (on the top panel) will illuminate, indicating the amplifier is on. If not, check the wiring, especially the remote connection from the source unit. Also refer to “Troubleshooting” on the next page.)
- On the source unit, increase the volume control until it is approximately 3/4 of its maximum output level. Slowly increase the Input Sensitivity control (clockwise) towards three o'clock and, at the same time, listen to the quality of the reproduced sound. At some point, you'll hear distortion on the music peaks. Stop the adjustment and turn it back slightly. This is the maximum undistorted output level of your system, and it should not be exceeded during use.

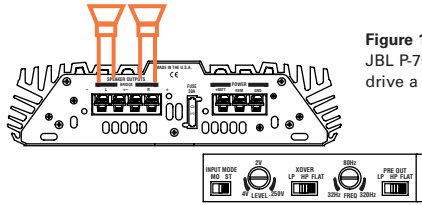


Figure 1. This wiring diagram shows a JBL P-7520 amplifier set to stereo to drive a pair of full-range speakers.

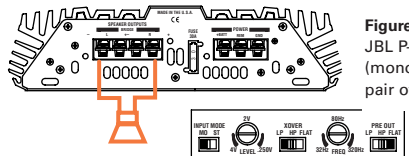


Figure 2. This wiring diagram shows a JBL P-7520 amplifier set to bridge mode (mono) to drive a single subwoofer or a pair of subwoofers (P-7540).

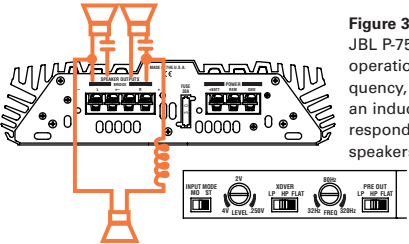


Figure 3. This wiring diagram shows a JBL P-7520 amplifier set for tri-mode operation. For a desired crossover frequency, use the chart on page 4 to select an inductor for the subwoofer, and corresponding capacitors for left and right speakers.

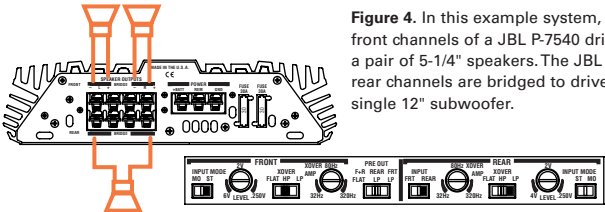


Figure 4. In this example system, the front channels of a JBL P-7540 drive a pair of 5-1/4" speakers. The JBL P-7540's rear channels are bridged to drive a single 12" subwoofer.

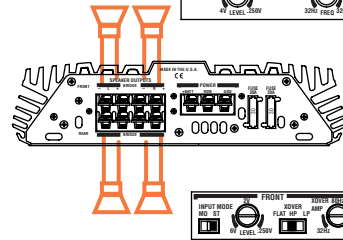
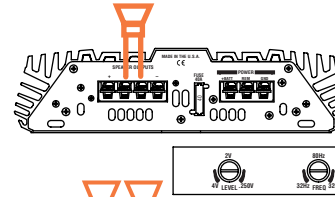
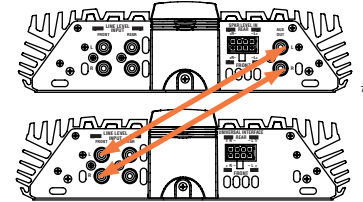


Figure 5. In this expanded system, a JBL P-7540 drives two pairs of 5-1/4" 2-way speakers. The JBL P-7540's pre-amp outputs feed a JBL P-2510, which drives a single 12" subwoofer.



3. After adjusting the level of the main speakers in your system, you should adjust the remaining channels (if you are using a P-7540 or a multi-amp system) for the desired system balance. You'll find this easiest to do by adjusting the channels in the following order: 1) front speakers, 2) rear speakers, 3) subwoofer. Elaborate, multi-channel systems may be complex to adjust. Your local JBL installation specialist is the best person to help with such an adjustment.

Applications

For your convenience, we've included several application diagrams to help you plan your own system installation. Figures 1 through 4 show how to configure the JBL P-7520, P-7540 or P-2510 for stereo, bridged-mono and tri-mode operation.

For system expansion ideas, see Figure 5 on the previous page. (Note: For simplicity, Figures 1 through 5 do not show power, remote and input connections.)

Many different system configurations are possible using the crossovers and pre-amp outputs featured in Power Series amplifiers. If you are considering expanding you system beyond what is shown here, please consult your local JBL installation specialist, who is experienced in designing complex mobile-audio systems.

Troubleshooting

Use the following guide to identify symptoms and solve problems. Make sure the vehicle's electrical system is working properly and power is reaching the amplifier.

Symptom	Likely Cause	Solution
No audio	Low/no remote on voltage	Check connections; turn-test turn-on voltage
	Speakers are not connected or are blown	Check wiring; use VOM/DVM to measure speaker-coil resistance
Distorted audio	Input sensitivity is not set properly	See Setting Input Sensitivity on page 5
Audio lacks "punch"	Speakers are wired with wrong polarity	Check polarity of connections; refer to Applications
Audio cycles off and on; amber protection LED (JBL badge on top panel) is flashing	A protection circuit is turning the amplifier off and on	Verify the following: off electrical system is between 5 ~ 18 Vdc; temperature is not over 194°F (90°C); there are no short circuits; speaker loads are not less than 2 ohms (4 ohms in mono)
Audio cycles off and on; amber protection LED (on top panel) is flashing	GAIN is set too high (see previous page)	Set Input Sensitivity correctly
Fuse blows	Incorrect wiring or short circuit	Check connections; refer to Applications

Specifications

P-7520, P-7540, P-2510

Specifications	JBL P-7520	JBL P-7540	JBL P-2510
Power Output, 4 ohms:	2 x 75 watts	4 x 75 watts	1 x 250 watts
Power Output, 2 ohms:	2 x 100 watts	4 x 100 watts	1 x 375 watts
Power Output, Bridged 4 ohms:	200 watts	2 x 200 watts	
Frequency Response:	20Hz ~ 20kHz +0dB, -1dB	20Hz ~ 20kHz +0dB, -1dB	20Hz ~ 320Hz +0dB, -1dB
Input Sensitivity:	250mV ~ 4V	250mV ~ 4V	250mV ~ 4V
THD + Noise (4 ohms):	0.05 %	0.05 %	0.1 %
Signal-to-Noise:	>100dB	>100dB	>100dB
Maximum Current Draw:	35A	64A	41A
Dimensions (w x h x l):	13-5/8" x 2-1/4" x 8-3/4" 347 x 58 x 223mm	21-5/8" x 2-1/4" x 8-3/4" 550 x 58 x 223mm	7-5/8" x 2-1/4" x 8-3/4" 194 x 58 x 223mm



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