



**100%**

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## Congratulations and thank you.....

for choosing *PrecisionPower* audio equipment. At *PrecisionPower* we proudly design, engineer and manufacture audio products at our facility in Phoenix, Arizona. Our award winning engineering team utilizes innovative technology to consistently deliver Absolutely State of the Art™ performance, sound quality, reliability, and value. This *PrecisionPower* product reflects our commitment to offer you unparalleled versatility and quality for years of dependable service and listening enjoyment.

### Service



Do not attempt to service *PrecisionPower* products yourself. Performing exploratory surgery on your audio equipment yourself will void the warranty. Many parts of your *PrecisionPower* gear are custom built to our specifications. Our factory parts are not made available to anyone else nor are they for sale. Our goal is to make sure that your *PrecisionPower* product will always sound as good as the day it was purchased. Contact your authorized *PrecisionPower* dealer about obtaining any warranty service through *PrecisionPower*.(See Warranty inside back cover)

### FOR YOUR RECORDS:

Model \_\_\_\_\_

Serial Number \_\_\_\_\_

Purchase Date \_\_\_\_\_

### Caution!



The extended use of a high powered audio system may result in hearing loss or damage. While *PrecisionPower* systems are capable of "Concert Level" volumes with incredible accuracy, they are also designed for you to enjoy at more reasonable levels all of the sonic subtleties created by musicians. Please observe all local sound ordinances.

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# FEATURES / SPECIFICATIONS



Adjustable left and right channel phase shift control

Phase control ByPass switch

Left and right 180 phase shift switch

Gold-plated RCA input and output connectors

PWM Power Supply

Remote turn-on capability

L.E.D. power indicator

Designed and Handcrafted in the U.S.A.

## Specifications



Signal-to-Noise Ratio	>102 dB
Total Harmonic Distortion (1KHz)	0.002%
Input Impedance	10k Ohms
Input/Output Gain	Unity
Maximum Input Voltage	8VRMS
Maximum Output (10 K $\Omega$ Load)	8VRMS
Supply Voltage	11-15 VDC

## Placement



The **PSC-221** has been designed to accomplish two basic objectives:

- 1) Make the subwoofer sound like it's in the front of the car (even when the subwoofer is in the back of the car).
- 2) Raise the perceived soundstage to ear level and solidify the center image (even when your front speakers are closer to your feet).

Both objectives are accomplished by shifting the signal phase, primarily in the lower midrange frequencies, resulting in arrival time corrections to the sound from your front speakers. In a typical autosound system, the signal path is divided into different frequency ranges (subwoofer, midrange, etc.) as well as locations (front and rear). For best results, localizing your subwoofer to the front, you will need an active crossover sending only subwoofer frequencies to the amplifier running your subwoofers.

*When placing your phase shifter:*

If your system is:	Insert the <b>PSC-221</b> in front of:
4 way	The midbass amp
3 way	The midrange amp
2 way	The full range/highpass amp

**Note:** The **PSC-221** will not improve your front stage if it is controlling only the rear speakers.

# INSTALLATION / MOUNTING

## NOTE:

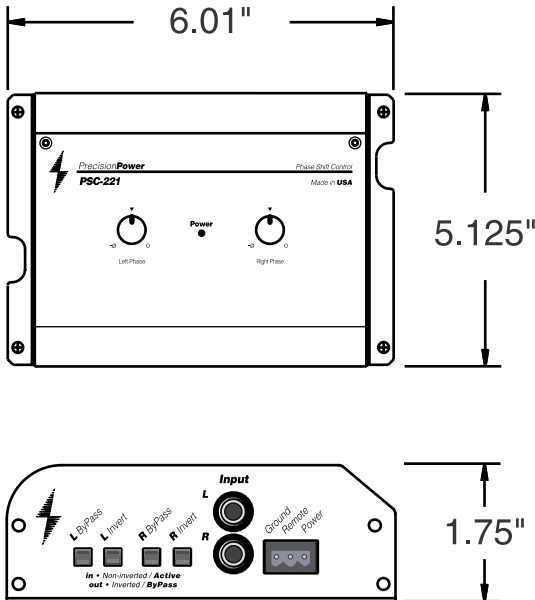
Before beginning, disconnect the negative (-) terminal of the battery to prevent an electrical short to ground. Reconnect the negative terminal only after all connections have been made.

## Mounting

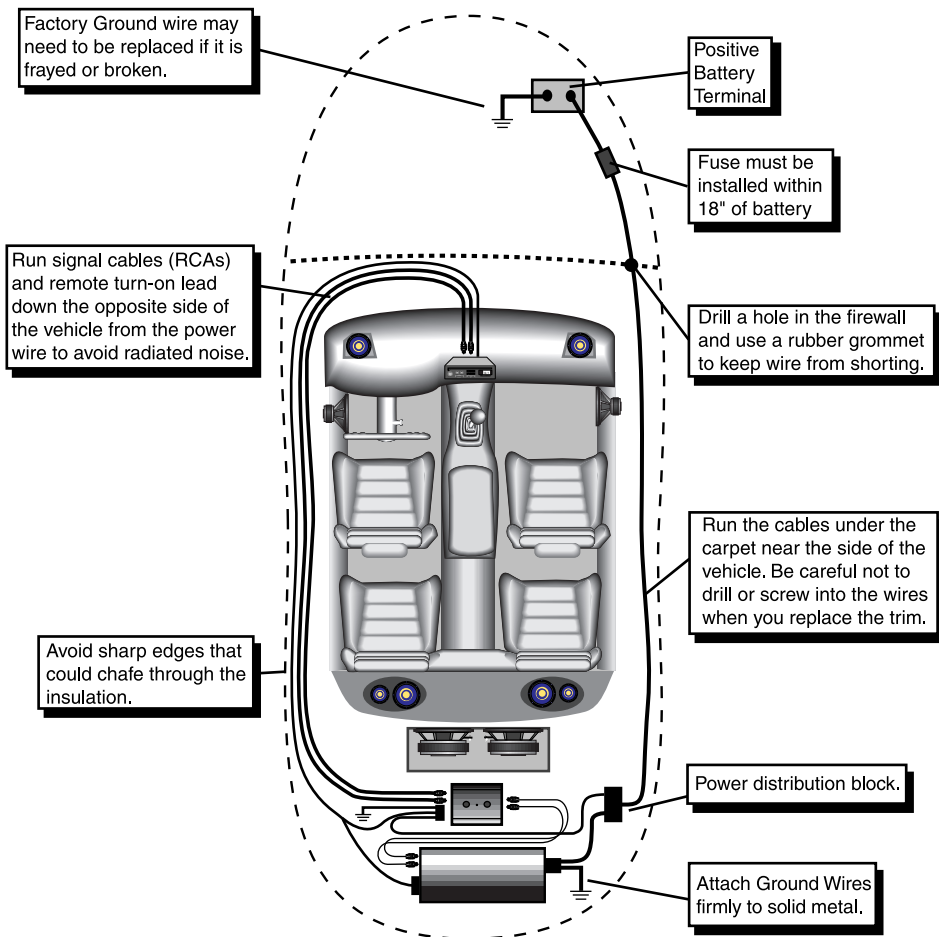


To prevent damage to the Phase Shifter while driving, mount it in a secure place. Choosing the appropriate location will depend upon your vehicle and the complexity of your system design. Typical mounting locations would be in the same location as your amplifiers and or crossovers. Never mount the component in a location that would subject it to immersion or exposure to water.

Once a location has been chosen, securely mount the **PSC-221** using the four screws supplied. Be Careful! Inspect the area underneath to be sure you are not drilling into wires, brake or fuel lines, etc. that could be damaged by the drill bit or screws.



# WIRING



## NOTE:



***Before beginning, disconnect the negative (-) terminal of the battery prior to working on the positive (+) terminal to prevent a short to ground. This is important, unless you want to spend the rest of your life with a nickname like "Sparky," or "Smokey." Reconnect the negative terminal only after all connections have been made.***

## WIRING

The next step is to connect the Power, Ground, and Remote wires to your **PSC-221**. The power wire should run from the mounting location through the vehicle to the battery or power distribution block. Avoid sharp corners, creases, and sharp body parts. When passing through any metal wall (i.e. firewall etc.), a grommet must be used to prevent the wire from chaffing and shorting to ground.

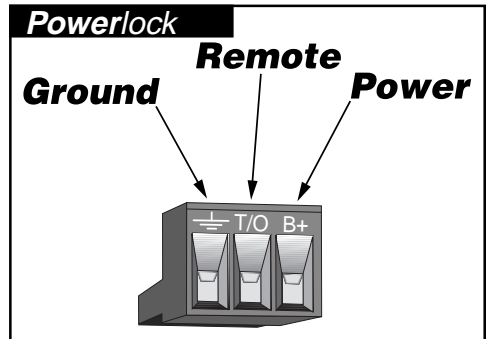
The ground wire should be of the same gauge as the power wire. As a rule of thumb, use as short a length of wire as possible.

Find a location near the **PSC-221** that is metal (the floor is ideal) and clean an area about the size of a quarter to bare metal. Drill a pilot hole in the middle of this area. Be Careful! Inspect the area underneath to be sure you are not drilling into wires, brake or fuel lines, etc. Terminate the wire with a ring connector and attach it to the bare metal using a #8 sheet metal screw and washer (not supplied). We suggest crimping and/or soldering this connection. After the connection is complete, coat the area with silicone or some similar material to prevent rust from developing.

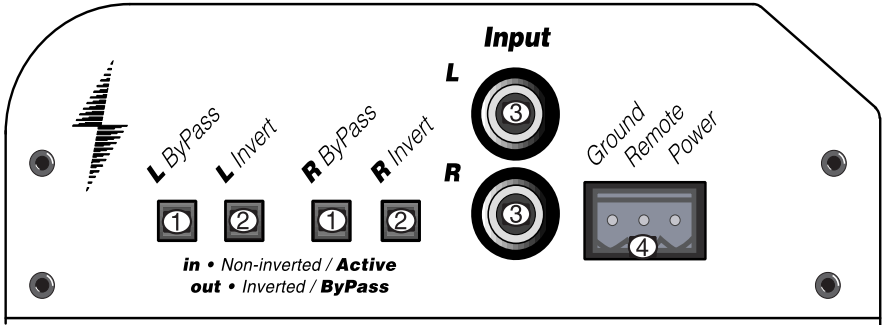
Finally, the remote wire needs to run to the power antenna (or amplifier remote) lead of the head unit. This wire supplies a 12 volt signal to the Phase Shifter when the main system is activated.

Once you have routed the power, ground, and remote wires through the vehicle, it is time to connect the wires to the **PSC-221**. Be sure that you have not reconnected the ground cable to the negative post of the battery.

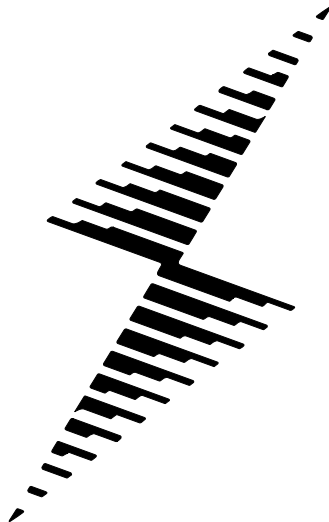
Cut off excess wire and, using wire strippers, strip the power, ground and remote cables about 1/8 inch. Locate the power, ground, and remote **Powerlock** connector (supplied). On the top of the connector are three slotted screws. With a small flat-bladed screwdriver, loosen the screws before attempting to insert the cables. After you have inserted the stripped end of each cable into the connector, secure it by tightening the associated screw. Check that each connection is tight. If the wires are secure, the connector may be plugged into the **PSC-221**.



# FUNCTIONS



- ① **Bypass Switch:** Gives you the ability to switch from the unadjusted system to the phase corrected system for easy comparison
- ② **Phase Invert Switch:** Gives you the ability to invert the signal. Left and right channels can be separately inverted.
- ③ **RCA Inputs:** Connect the RCA cables from the head unit, preamplifier, or another processor here.
- ④ **Power Connector:** Connect Ground, Remote turn on and Power wires to the **Powerlock** connector and plug it in here

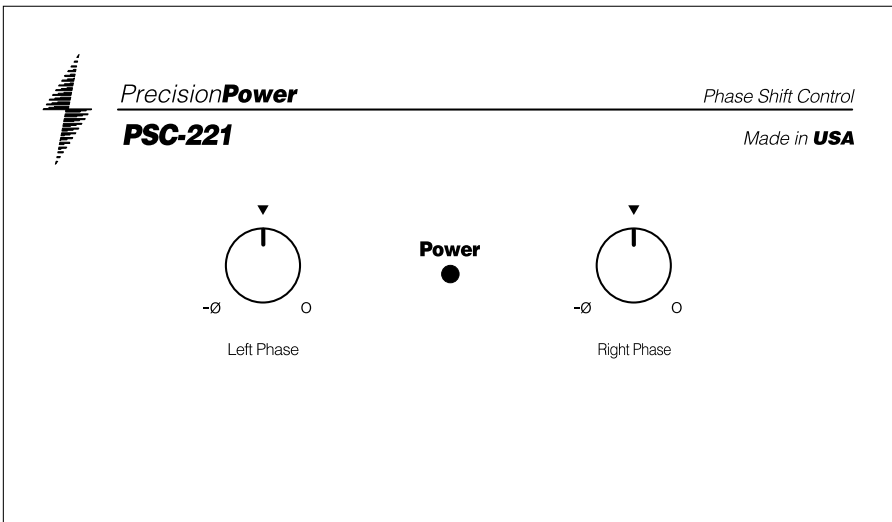




# FUNCTIONS



- ⑤ **RCA Outputs:** Connect RCA cables from the *PSC-221* to the amplifier



- ⑥ **Phase Controls:** Use these two controls to adjust the amount of phase shift for left and right channels.

## Adjustments



To make the adjustments easier, it is recommended that you create a temporary extension cable for the power, ground, remote and preamp cables that will allow you to extend the **PSC-221** to the drivers seat. This will enable you to make adjustments while listening to the system. For a starting point, set both the **left and right phase** controls to the fully clockwise position, the phase invert switches to the out position and the ByPass button to the out position.

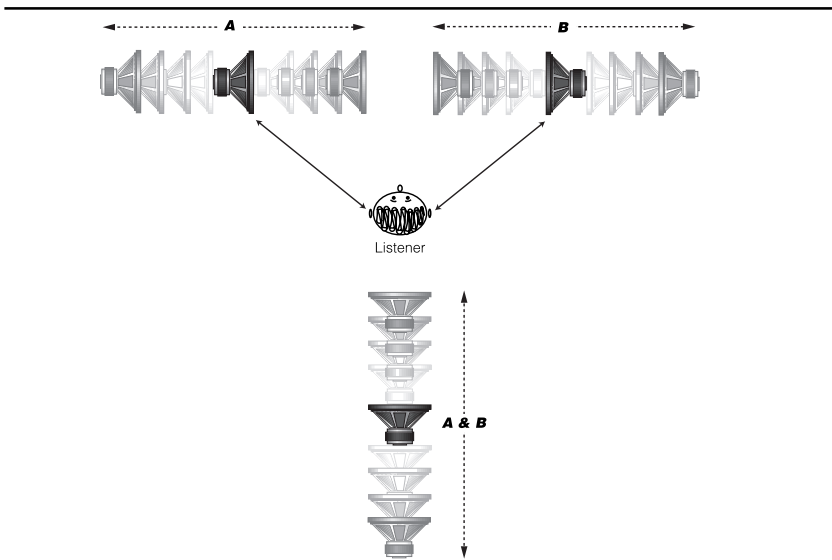
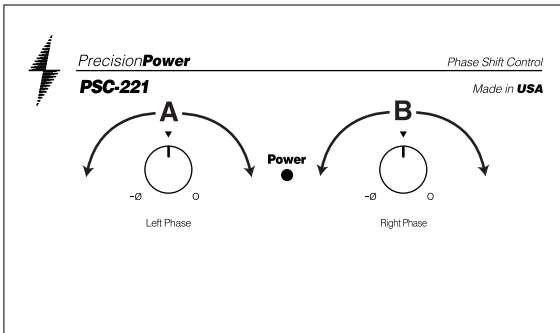
Choose a selection of music that has a clearly defined vocal and acoustic track. This will be very helpful in placing the center image where you want it to be.

Listen to the music you have selected for a few moments prior to making any adjustments. Pay close attention to the location of the individual instruments and the vocalist. Once you have a good feel for their locations throughout the stage begin making adjustments by moving the right and left phase controls in unison. Start from the far right (or clockwise position), sweep both controls from right to left listening for an improvement in the bass location. You want the bass to become localized up front.

If you still can't localize the sub bass up front you may need to reverse the phase invert switches on the endplate.

Once you have the sub base up front, continue making small adjustments of both phase controls. Move the detented controls together, but in opposited directions one position at a time, until you have achieved the desired stage for your system. Remember, this adjustment is very subjective and will take time to achieve the correct combinations of settings for your particular system. Listen to several tracks now, and check your progress using the bypass switches.

# MAXIMIZING PERFORMANCE



These illustrations show the effect the phase shift controller has on your perception of the sound stage “image” as you adjust each control.

## **NOTE:**



*It is important to remember that both controls should be moved in unison but in opposite directions after you have achieved your starting image so you don't lose the up front sub stage you have acquired in your initial adjustments.*

# TROUBLE SHOOTING

## NO SOUND

Is the LED lit?

**YES**

Check Input cables for signal by connecting them straight to the amplifier

**NO**

Check Power and Remote turn-on wire for voltage. Make sure Ground wire is secure.



**ANY SOUND NOW?**

**YES**

Problem is in the **PSC-221**. See your local Authorized **PrecisionPower** Dealer or call 1-800-62**POWER**.

**NO**

Problem is elsewhere in the system. Check head unit and amplifiers.

## SOUND IN ONE CHANNEL ONLY

Reverse left and right RCA outputs.

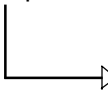
**SOUND IS NOW IN**

**OPPOSITE CHANNEL**

Reverse RCA inputs

**SAME CHANNEL**

Problem is in the amplifier, speakers or associated wiring of the silent channel.



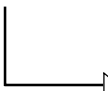
**SOUND IS NOW IN**

**OPPOSITE CHANNEL**

Reverse RCAs at head unit (Check Balance control)

**SAME CHANNEL**

Problem is in the **PSC-221**. See your local Authorized **PrecisionPower** Dealer or call 1-800-62**POWER**.



**SOUND IS NOW IN**

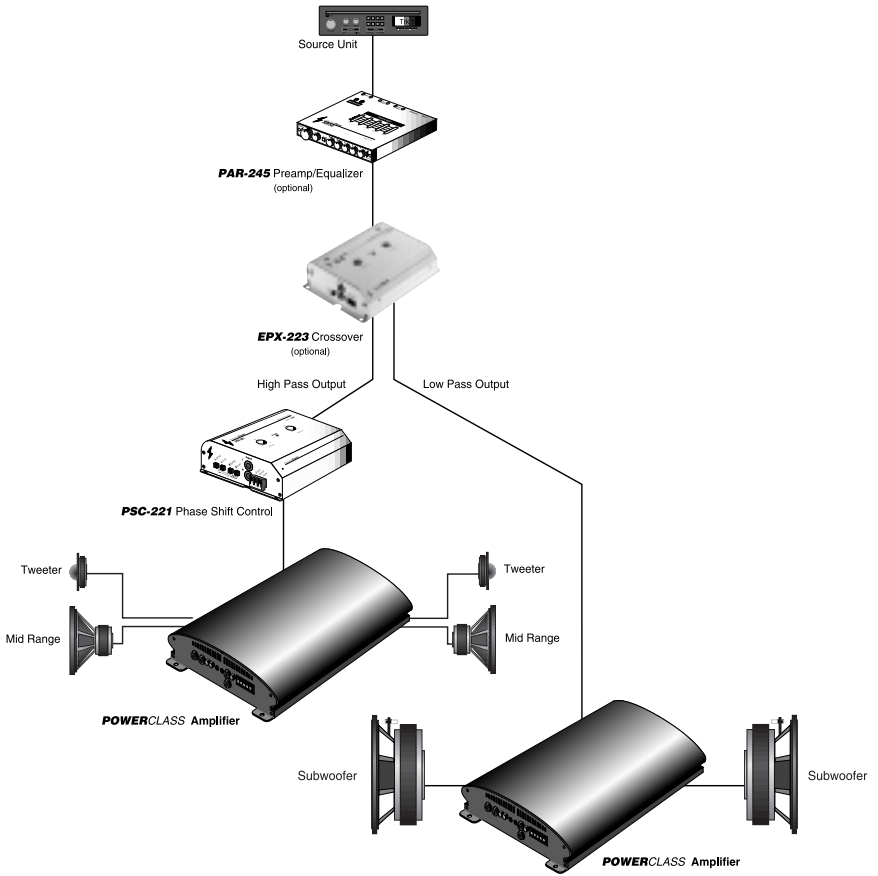
**OPPOSITE CHANNEL**

Problem is in the head unit

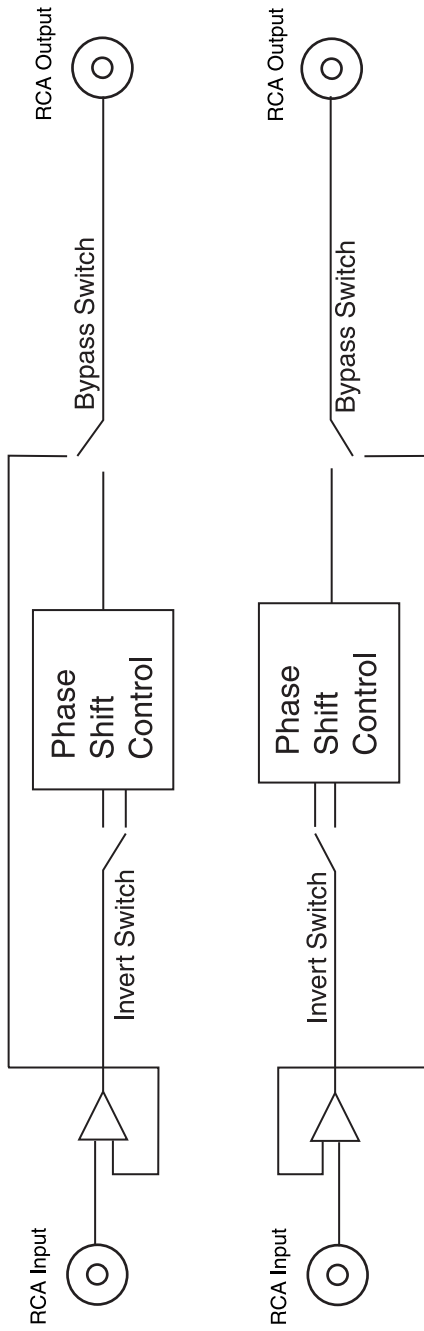
**SAME CHANNEL**

Problem is in the RCA cables

# SYSTEM ONE



# BLOCK DIAGRAM



# WARRANTY

## Three-Year Limited U.S.A. Warranty

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. *PrecisionPower* warrants its products to be free from defects in materials and workmanship under normal use and service for a period of three (3) years from the date of original purchase when the unit is installed by an Authorized Dealer. Non-Authorized Dealer installed products carry a one (1) year parts and ninety (90) days labor limited warranty. The extent and conditions of Limited Warranty are as follows:

1. Authorized Dealer Installed Products: *PrecisionPower* will either repair or replace at no charge, to the original purchaser, any unit which *PrecisionPower's* examination discloses to be defective and under warranty, provided the defect occurs within three (3) years from the date of original purchase when the unit is installed by an Authorized Dealer and the product is returned immediately to *PrecisionPower*. This warranty is not transferable.

2. Non-Authorized Dealer Installed Products: *PrecisionPower* will either repair or replace at no charge, to the original purchaser, any unit which *PrecisionPower's* examination discloses to be defective and under warranty, provided the defect occurs within ninety (90) days from the date of purchase and the product is returned immediately to *PrecisionPower*. Warranty claims beyond ninety (90) days for Non-Authorized Dealer Installed Products will be for parts only and will extend for one (1) year from the date of purchase. This warranty is not transferable.

3. The date of purchase and proof of Authorized Dealer Installation of a PrecisionPower product must be established by an original sales receipt which must accompany the article being returned for warranty work.

4. This warranty shall NOT apply to any *PrecisionPower* product found to have the original factory serial number removed or defaced. All products received (by *PrecisionPower*) for in warranty or out of warranty repair, with their original serial numbers removed or defaced, will NOT be repaired and will be returned to sender, freight collect. Refer to original packaging for the serial number of your component speakers.

5. The provisions of this warranty shall not apply to any *PrecisionPower* product used for a purpose for which it is not designed, which has been repaired or altered in any way, or which has been connected, installed, or adjusted other than in accordance with the instructions furnished in *PrecisionPower's* owner's manual. Nor shall this warranty apply to any part which has been subject to misuse, neglect, or accident.

6. PrecisionPower does not authorize any other persons to assume any other liability in connection with its products. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY MADE BY PRECISIONPOWER APPLICABLE TO ITS PRODUCTS. ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE APPLICABLE TO PRECISIONPOWER PRODUCTS IS LIMITED IN DURATION TO THE DURATION OF THIS LIMITED WARRANTY. PRECISIONPOWER SHALL NOT BE LIABLE FOR THE INCIDENTAL, CONSEQUENTIAL, OR COMMERCIAL DAMAGES RESULTING FROM THE BREACH OF THIS WRITTEN WARRANTY. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts; so the above limitations or exclusions may not apply to you.

7. Your product will be serviced on an in-warranty basis within the warranty period for the correction of warranted defects. If improper operation of your *PrecisionPower* product should occur, contact your Authorized Dealer for assistance with the return and factory repair of your *PrecisionPower* product. If an Authorized Dealer is not available, return the unit including your name, telephone number, return address, a copy of your sales receipt, and a description of the problem to:

**PrecisionPower, Inc.  
Service Department  
4829 S. 38th Street  
Phoenix, AZ 85040-2964**

TO RETURN PRECISIONPOWER PRODUCTS OUT OF WARRANTY: Return the unit, postage prepaid, in the original protective carton. Please include a description of the problem and, if desired, a request for an estimate of repair costs. Unless a request for an estimate is included, the unit will be repaired as necessary. Please contact *PrecisionPower* Customer Service at 1-800-62-POWER for questions concerning out of warranty repair charges. Repaired unit will be returned with an itemized statement, C.O.D.

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