User Manual for the Diezel Paul Amplifier

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Chapter One: Safety and Warranty

1.1 Safety Warnings

We would like to stress the importance of the following points, for reasons of your personal safety, product longevity and product liability.

Do not use the amplifier in or near wet locations
Do not store the amplifier in damp or wet locations
Do not operate the Amplifier on voltages other than those designated on the rear panel of the amplifier.
Do not open the panels of the amplifier. No user serviceable parts inside.

Your Paul operates on very high internal voltages, which may still be present after the Amplifier has been turned off and disconnected for a while.

Do not use the Amplifier for anything other than its design purpose: To Amplify Electric Guitar Signals!
Do not use fuses other than those intended and specified for the amplifier
Do not use 2-conductor extension cords or anything other than 3-pole g rounded outlets for this Appliance. Your life may depend on it!

Please observe the following points when transporting your Paul:

Paul is a Tube Powered Amplifier; therefore it is sensitive to shock, especially after playing the amplifier for a while. Please store and transport your amplifier gently, and try and avoid temperature extremes in storage, which might cause condensation resulting in moisture on internal components. Usually a 60 Minute acclimatization period is sufficient to ensure safe operation.

The Amplifier should be stored in a controlled environment, and it should be transported in a suitable flight case. Make sure the Amplifier gets transported in its normal operating position, not upside down or on its side.

The Paul’s Design incorporates a very potent power amplifier. It is configured to deliver satisfying guitar tone at most volume levels, from a small bedroom to a large arena. In its normal operational volume level (75-80dB) it will provide beautiful tones with very little coloration. For reasons of your own personal health, please do not run the amplifier above these levels for extended periods of time without wearing hearing protection. Hearing Loss is a long -term problem, and is normally not curable.

Chapter Two: Using Your Paul

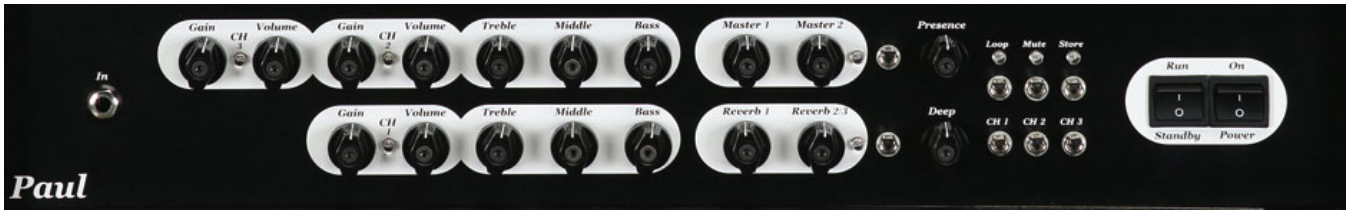
2.1 Mains Connections, Power and Standby

2.1.1 Mains/Connection to Power Outlet

Please make sure that both switches (Power and Standby) are in the off position before connecting to the Mains circuit. Verify line voltage before connecting the power cord. Never start Paul without speakers being connected to the proper terminals. (See 3.2.8)

2.1.2 Power up, Warm up, Standby off

First turn the Power switch to on (facing up). The indicator will light up. This starts the tube heating process. After about 40 seconds, the tubes have sufficiently heated for normal operation. Your Paul is now ready for operation and the standby switch can be turned to "run" (also facing up). Premature activation of the standby switch will lead to unnecessary tube stress and subsequent reduction of the power tube's life span.



2.1.3 Power Tube Caution

Tubes are electronic components that only function with vacuum intact and under very high operating temperatures. Each tube has one or more heating filaments, much like a light bulb. These filaments heat up the Anode of the tube. If you switch the standby switch before these Anodes have reached their operating temperature then the Anode surfaces are not heated evenly yet; the "operating temperature" of the tube is not reached yet. This causes undue stress on the tubes and their related components inside the amp. One should therefore always give the amp it's much needed warm-up time, even if musical inspiration hits with full force.

2.1.4 Operating Temperature

t will take a little more time after warm-up until everything inside the amp is working in sync and to its fullest potential. A trained ear will notice a slightly warmer tone and better complexity in tone after playing the amp for a short while. It’s like warming up before running a marathon. Get it?

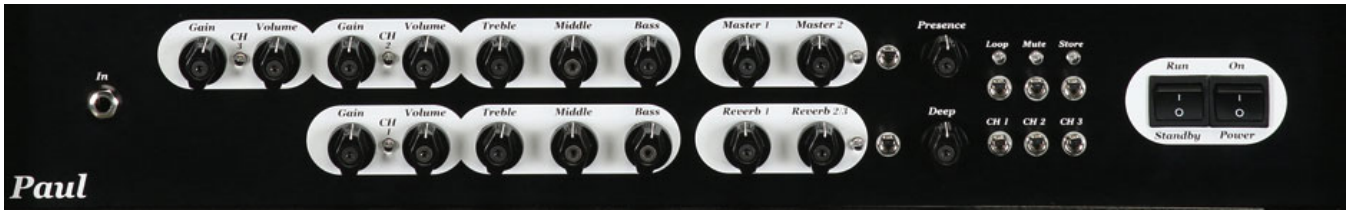
2.1.5 Power Tube Life

The power tubes of your amplifier are subject to a certain aging process. Once one of the tubes shows signs of aging, unreliability or unusual noise, then we suggest that you replace all power tubes. Matched tube sets wear relatively even, or so our experience suggests. This means if one goes, the others are not far from meeting the same fate.

The aging process manifests itself by a depletion of a thin layer of Wolfram on the Anodes. This can take anywhere from 6 month to 3 years, depending on the amount of use of the amplifier. The amount of wear is determined by the amount of performance that is asked from the tube.

Chapter Three: Peripheral Connections

3.1 Front Panel Connections



3.1.1 The input jack ("IN")

The input jack receives your Electric Guitar signal by means of a shielded guitar cord with 1/4" mono style plug.

Your guitar cord is an important part of your signal chain and its quality and construction type clearly affect the overall tone of your rig. Try and buy the best quality guitar cord that you can or want to afford. Call us if you have doubts and need recommendations. This is where the smart "weak link" comment comes in. Get it?

3.1.2 Cable ABC

Some cords and cables sound very neutral; others color the sound spectrum and/or attenuate high frequencies due to capacitance inside the wire and shield. What are we talking about? OK. A capacitor is used in electronic crossovers, amongst other things, to divide low and high frequencies. Capacitance in a cable therefore cuts your guitar's high end to a certain degree. Generally, the longer of a cord you use, the more of the cords inherent characteristics will be audible.

3.1.3 Cable Selection

In certain instances it is desirable to match a guitar cord to a specific instrument. One can use the otherwise undesirable qualities of a cord to one's advantage, if one has the time and patience to experiment with different cords and guitars. You should do this when playing with a band or when you are recording. Sometimes it is difficult to tell a component's true advantages until it is used in the right context. A guitar that has very piercing highs could theoretically be tamed down somewhat by the use of a long guitar cord that offers some high-end attenuation. The loops of your Diezel Paul send signals at higher levels and impedances, which makes this section of wiring less sensitive. You should still use reliable and good quality wiring for all loops and inserts.

3.2 Rear Panel Connections

3.2.1 Send/Return Loop

The System consists of 2 separate Loops. It allows creation of effects path in either serial, or parallel configurations. The individual channel volume controls determine the signal strength at the send jacks. The range is - ... to +10dB. The output impedance is 4.7 kOhm. If you want to use the loops, then connect the "Send" to the input of the Effects unit. Be sure and adjust the input level of the effects unit to the amplifiers level. Most effects units have led bar or other level control devices. The Output of the effects unit must be connected to one of the return jacks, parallel, switched, or serial. If you use the parallel return, then the signal can be mixed to the original signal via the rear panel mounted "Volume" control.

3.2.2 Parallel or Serial

Which is better for you? Read on.

There are 2 ways to handle effects signals. If you use the serial return, then the signal path of your Paul is interrupted, the signal is sent to the processor, gets more or less processed, then sent back to the serial return into the power amp. Digital effects units often digitize this signal, then process it, then convert it back to analog, then send it to the amp. This is called ADA conversion. It is necessary for digital effects units to do this to your guitar signal, so that it becomes a digital code, which the processor can read and understand. Your tubes, however, need an old fashioned analog signal, so the processor needs to convert the signal back to analog before it goes back to the amp. Generally, even in highest quality effects processors, this causes a change in the original signal, typically a loss of tonality and warmth, also noticeable as a "harder" sound.
When you use the serial loop for an effects unit like this, then your signal will have been ADA converted at least once. Tone junkies and vintage freaks alike will more than likely have hives developing by now. But, as always, there is a better way. Using the Parallel loop and the mix (labeled "Volume") control on the back determines how much effect signal is being added to the original signal, which now still flows through the amplifier. There is always an analog connection between the send and return jacks: a parallel loop!

Important: You must set the mix control on the effects unit to 100% wet when using the parallel loop. Otherwise there will be nasty phasing problems resulting in unsatisfactory tone. The signal portion that is unaffected by the mix control in the effects unit would reach the amplifier at a different time due to the cabling, and cause phasing cancellations.

3.2.3 Compensated Out

A frequency corrected signal will leave this jack if you connect it to a mixer or recording device. Use it to quietly compose or send an auxiliary signal to a console etc. Always make sure that your amp is connected to either a loudspeaker or a load (i.e. THD HotPlate).

3.2.4 Speaker Connections

Paul has 5 speaker jacks: 1 for a 16-Ohm load, 2 for 2 16-Ohm loads or 1 8Ohm load, and 2 for 2 8-Ohm loads or 1 4-Ohm load.

Examples:

Using two 8 Ohm cabs: each cab goes into the 4 Ohm outs (because 2x8Ohm results 4 Ohm)

Unsing two 16 Ohm cabs: each cab goes into the 8 Ohm outs (because 2x16 Ohm results 8 Ohm)

3.3 MIDI Connections

3.3.1 MIDI In

Midi in receives "program change" orders from commonly available midi pedals and control systems. The Paul is able to supply phantom power to your midi pedal via a 7-prong DIN midi cable. This can help unclutter your stage system and rids the artist of these pesky power supplies.

in 1 and 6 is ground (-) Pin 3 and 7 is hot (+)

The voltage is 9-12V AC or DC, which is acceptable for 98% of all midi pedals. Maximum power usage of the pedal cannot exceed 800mA (0.8A) Please observe proper polarity to avoid damage to the MIDI pedal.

3.3.2 MIDI Thru

This jack routes the midi signal to other midi partners. MIDI data not addressed to the Paul gets looped through this jack.
See chapter 7 for MIDI programming instructions

Note: The Diezel Paul also comes with a jack to connect a Diezel Columbus pedal (via standard XLR cable) or Diezel's FS7PA which connects to Paul with a standard mono

audio cable (guitar cable).

Chapter Four: Three Pre-Amplifiers

4.1 Pre-Amplifiers and their Functions

The Diezel Paul comes equipped with 3 different and totally independent preamps. This allows the artist to play every conceivable musical style without having to make major changes to his or her amplifier. The preamps are voiced to deliver the 3 most wanted guitar tone flavours: 1-Clean, 2-Crunch/Heavy 3- Lead. Channel 2 and 3 share their EQ.

This concept delivers 3 stellar guitar sounds with excellent playability, warm dynamics and razor sharp equalization possibilities. The tone controls work in an unusually wide range, so a little adjustment goes a long way. As with so many other things - less is often more. We suggest you start exploring the channels with all controls set to 12:00 o'clock, and the master volume just slightly cracked open. (To avoid hearing damage)

4.1.1 Channel One (Clean Tone)

Clean Tone is a very sensitive subject, because there are so many different ideas on how a clean amp should sound like. Clean tonal textures require much higher dynamic range than distorted sounds. From hard and percussive sounds too soft and warm blossoming tones. Paul was designed to offer as many of the clean variety as possible. Your choice of guitars and pickups will have a large part in this equation.

4.1.2 Channel Two (Crunch)

This channel's main objective is to cover soft and heavy overdrive and distortion sounds.

4.1.3 Channel Three (Lead)

This channel is voiced for highly articulate single note lines or for very heavy and massive rhythm guitar. Due to its slight midrange accent and very high gain structure, it possesses good punch and will, with ease and authority, rule any stage or studio. The “less is often more” rule applies here also.

4.1.4 Reverb

The section Reverb incorporates controls for Reverb 1 and Reverb 2/3. The reverb on/off switch allows you to apply the reverb (digital, signal taken off before the send) via midi to your sound.

Reverb 1 applies to channel 1 while Reverb 2/3 to channels 2 and 3. Adjust the amount by turning the potentiometer clockwise. Recommended are levels between 9 and 12 o’clock to add depth and warmth to the tone, esp. in channel.

4.2 Pre-amp Tubes

The pre-amps are equipped with 12AX7 tubes in all positions. The pre-amp tubes are not used to make big power, but merely as pre-amplifiers. Therefore their life expectancy is much higher than that of the power amplifier tubes.

This is not to undermine their utter importance in overall sound and response of the amplifier. Also, many nuisance defects like crackling noises and low dynamics are directly related to defective pre-amp tubes. Like all other tubes, 12AX7 tubes come in many different gain stages, and offer a wide variety of tonal behavior. Our choice for production was made to ensure a wide variety of tones, with low noise and, hopefully, excellent reliability. The overall performance of pre-amp tubes is easily influenced by mechanical factors from the outside. This would manifest itself by a sudden feedback sound with high pitch. The input stage is especially suspect to this phenomenon. If one encounters microphonic tube behavior, then the first tube should be checked as a rule. Pre-Amplifier tubes can also cause hum or other bad noises, like crackling or ticking.

Chapter Five: Power Amplifier

5.1 Tone and Volume of the Power Amplifier

5.1.1 Master Volume

As the name suggests, this controls the overall, global volume of the amplifier. For your enjoyment, there is also a second programmable master volume control, which allows volume adjustments via remote control while you are playing. Both controls are laid out so that even a low-performance effects unit can be used and amplified in the loops.

5.1.2 Presence

This knob controls frequencies over 3KHz. Treble is produced and dispersed in a very small beam from the speaker, so be sure to position yourself in the projection area of the speaker when making adjustments.

5.1.3 Deep

The Deep control is an active bass control, contrary to conventional bass controls. It controls the frequencies around 120Hz without influencing the overall dynamic range of the power amplifier. Diezel Co. is not responsible for disintegrating speaker cabinets.

5.2 Power Amplifier Tubes

5.2.1 Function

As the name suggests, the power amp section is the part of the amplifier that produces output power, measured in watts. Preamp signals are sent to the power amp(s), which amplifies this signal to a level that is acceptable for loudspeakers. Guitar amplifiers utilize several different types of power amps, which differ in output power and tone. We chose the tube type power amplifier for its tried-and true performance and familiar tonal behaviour.

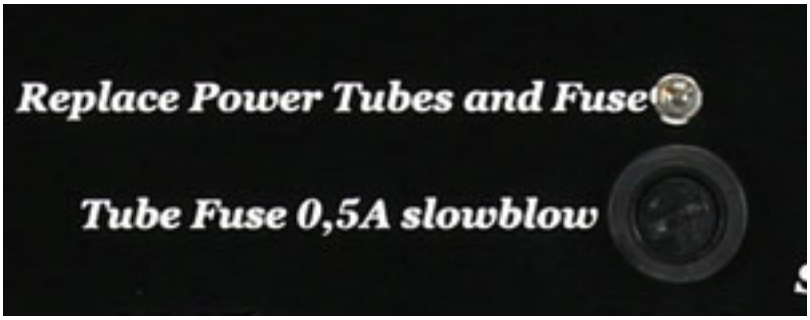
5.2.2 Selection

Diezel Co. installs the most reliable and best sounding tubes that are currently available in sufficient quantities. So it is possible that tube brand and tube type will change during production. You can fine-tune your Paul by having different type and brands of tubes installed, however, it is imperative that the amp is biased properly. Paul utilizes 4 power tubes, organized in 2 pairs with dual bias possibility. This allows use of 2 different pairs of power tubes, either the same or different types.

5.2.3 Life Span – Tube Fuses

Power tubes last 1 to 3 years, depending on care, volume and frequency of use of the amplifier. If you use your amp only once a month, then the tubes will obviously last longer. Really… We have heard tubes that are over 10 years old, but it was not a good thing. Tubes age in a very slow manner, slow enough for the artist to get used to the changing tone. To keep things fresh and to keep your tube dealer in business, we recommend re-tubing, cleaning and biasing once a year if the amp is used frequently.

The pair of Paul's power tubes has its own tube fuse. Once a power tube may be broken, the LED on the back will lit and in many cases also the corresponding fuse is blown. Replace the fuse (20mm, 500mA) and tubes in this case. Replacement of the power tubes needs rebias of the amp, which should be done by an experienced tech.



Chapter Six: Functions and Switches

6.1 Programming the Paul

It is quite easy to program your Diezel Paul and, also, easy to explain. Pushing the "Store" toggle switch twice must follow each change in the MIDI program. After the first click, the selected blue LED lights will blink. Click on the switch again and your program is in memory. Each of the 128 programs (patches, program changes) can be changed as often as is desired.

6.2 Manual Channel Selection

The 3 channels/loop/reverb/master 1/2 of the Paul can be selected manually by activating the corresponding switch, or can be programmed via the midi control system. If you assign the Channel one switch function to a MIDI program (for example "01"), then you can initiate this channel's switching via your MIDI pedal. Push "01" on your MIDI pedal after programming and the pedal will send digital information to the amplifier. The amp will read this information and decide whether or not it is supposed to respond. When properly programmed, it will then switch on channel one.

OK, here it is again:

Select 01 on your MIDI pedal. Select channel one of the Paul. Now push "Store" twice. Voila, it's a MIDI program! Now select program change "02" on your pedal, switch the amp to channel two, hit "Store" twice, and suddenly you have a MIDI pedal controller with 2 program changes. Continue on until you run out of channels, about 1 more time.

All the other functions of the amp can be programmed in the same exact way. Remember: push "Store" twice to finalize a MIDI program procedure. Select the program on the pedal to recall the setting from the amp.

6.3 Reverb on/off

The switching function "Reverb" is applicable to all channels. The Reverb is active when the corresponding LED is lit. Reverb levels can be adjusted for channel 1 and channel 2/3.

6.4 Loop On/Off

This function activates a device that is connected to the switch-able loop.

6.5 Mute On/Off

"Mute" silences the beast. "Tuner Out" stays active. Makes sense, no?

6.6 Master 2 On/Off

Master 2 can be used for all channels, much like the Mid Cut function.

6.7 Store

As discussed earlier, this is the universal programming button. Activating this button twice will verify an intended program procedure. In case you have pushed this button once by accident, or if you have started to program and don't want to anymore for whatever reason, then you can push any other switch (any switch but the "Store" switch) to cancel the programming procedure. The previously established program will be preserved. On models equipped with GPS, this will call out the quickest way to a nearby music store.

Chapter Seven: MIDI

7.1 MIDI

MIDI is an acronym for Musical Instruments Digital Interface and is an internationally accepted communications system between musical instruments (and processors and computers) of all kinds. We will only need to learn a small portion of this "language" to use the Paul and its peripheral MIDI partners. We are going to learn only about "program change".

7.2 MIDI In

MIDI In is a 7-pole DIN jack. It must be connected to the MIDI Out jack of your foot controller (or MIDI pedal), or the MIDI Out of any effects unit connected to the pedal directly.

7.3 MIDI Thru

Connect this port to the midi in of other units to continue the MIDI chain

7.4 MIDI Communication

7.4.1 Omni Mode

The Omni mode will allow reading of MIDI information on all 7 channels. It is an easy way to get into the MIDI system but it is not advisable if more MIDI partners on different channels are in the same system. Then a certain MIDI channel should be assigned to the Paul and its program changes should be restricted to this channel (See 7.4.2). To put the amp into the Omni mode, hold the "Mute" switch down and activate the "Master 2" switch quickly and then release the mute switch. The Mid Cut, Master 2, Loop and Store LED's will now blink to verify that the Omni mode is being accepted. Channel LED´s should be off. This function needs to be disabled under some circumstances in order to use single mode automatic or single mode manual.

7.4.2 Single Channel Mode – Automatic Channel Recognition

Your Paul can automatically recognize the pedal's send/receive channel. To get your amp into the mood (or mode) for this, push and hold "Mute" and then activate any program change button on your MIDI pedal. The amp will look for a program change and recognize the channel it is being sent on. Then it will switch to this channel and stay there as soon as you let go of "Mute".

7.4.3 Single Channel Mode – Manual Channel Selection

If you would like to have your Paul on a certain MIDI channel, then we can accommodate you here as well. Here is how this works:

Push and hold "Mute" and then turn on the preamp channels in the order that corresponds to your midi channel preference. For example: if you want to have your Paul to respond only to MIDI information that is being sent on channel 7, then you must hold the "Mute" button down and turn the Preamp channel one selector off, channel two selector on, channel 3 selector on. If you let go of "Mute" now, then your Paul is set to respond to MIDI channel 7 only. Get it? The table below gives you the sequence for all 7 MIDI channels.

Midi Channel	Ch1	Ch2	Ch3
1	off	off	off
2	on	off	off
3	off	on	off
4	on	on	off
5	off	off	on
6	on	off	on
7	off	on	on

7.5 Program Information

Paul can remember up to 128 program changes.

7.6 Phantom Power

Several of the pins in the MIDI jack can supply phantom power to your MIDI pedal, as explained in chapter 3.3.1

Chapter Eight: Footswitch

The optional Columbus footswitch can be connected via the rear panel mounted XLR jack. Alternatively a Diezel FS7PA can be used with your Paul. It connects with a standard guitar cable.

Chapter Nine: Maintenance and Cleaning

9.1 Cleaning

Never use a wet method of cleaning the amplifier, i.e. any amplifier. Usually it is sufficient to wipe down the outside of the amp with a slightly moist cleaning rag. Do not use abrasive cleaning chemicals. Sometimes a vacuum cleaner can be used to remove dust and dirt from nooks and crevices. Do not remove the chassis from the housing to clean the amp. The inside of your amp carries dangerous voltages.

9.2 Care

Be gentle with this amplifier. Any mechanical shocks and wide temperature changes, moisture-rich environments and extreme conditions (dust, wind, heat, cold and moisture) can substantially shorten tube life, in some cases, even amplifier life.

Do not block the air circulation grilles in the front and in the back of the amp. Do not push the amp right up against objects that would interfere with its normal airflow. The top of the amplifier might get warm after prolonged use, this is normal, but will melt your ice cream and definitely ruin your beer. Never put beverages on top of the amp where they could spill and flow inside the amplifier. You'll hate it if this happens, guaranteed!

9.3 Tube Change

Tube changes are only to be undertaken by authorized service personnel. If power tubes with different values then the original ones are to be installed, then the amplifier must be re-biased before operation can be resumed. The amplifier uses a three circuit bias system. It is quick and easy to accomplish biasing, but involves removing the chassis and use of specialized equipment for measuring currents inside the amplifier. Only trained professionals should attempt this procedure.

The Diezel Company wishes to express their gratitude and congratulate you on your decision to purchase the Diezel Paul Amplifier.

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