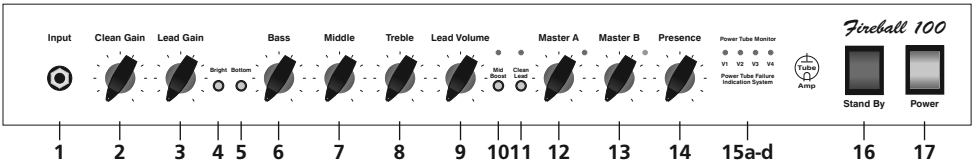
E635
Fireball 100
Operator´s Manual

ENGL Fireball 100 - more tone, more punch, more Fireball than ever before - burn up the stage and feel the heat! The ENGL Fireball 100 guitar amp head offers all essential sound features in addition to a practical, clear layout for all players who appreciate straightforward structures.
In its cool "black magic" optical appearance the amp delivers a mighty bottom end punch well suited for playing power chords and solos with precise accentuation, courtesy of its powerful 6L6GC-100 watts poweramp. Sparkling clean sounds and every imaginable nuance between Clean and Hi Gain Lead tones belong to the repertoire of the Fireball 100 amp.
Other trademark ENGL features include: * two Master volume controls A and B, * electronic poweramp monitoring * and a variable / switchable FX Loop. Additionally, the sound shaping features Bottom and Mid Boost lets you reinforce ingeniously this particular pressure in low-end and the low-mid frequency range, thus expanding the amps' tonal spectrum. ENGL improved another important audio kink - an adjustable noise gate for the Lead channel.
Old world craftsmanship and highest quality components are part of what makes ENGL amps so special and the Fireball is no exception. On that note, please read and heed the guidelines on handling all-tube amps. You'll find them on the last page of this manual. The ENGL team is convinced that the Fireball amp will delight and inspire you - just plug in your guitar and play!

Front Panel



1 Input
¼" unbalanced input jack. Plug your guitar in here using a shielded cord.
A tip from the designer:
Depending on the type of cord and its shielding, you may occasionally encounter interference from sources such as radio stations or powerful magnetic fields. When this occurs, try connecting your guitar to the amp using different cords. What's more, to minimize signal degradation due to high-frequency loss, use the shortest cords feasible (as a rule, the shorter the cord, the less susceptible it is to high-frequency attenuation).
2 Clean Gain
This knob determines input sensitivity of the Clean Channel, in other words, the input level of the preamp during Clean mode.
A tip from the designer:
The amount of distortion depends on the type of pickups your guitar is equipped with. Single coil pickups may overdrive the preamp when the knob is set to about the two o'clock position in Clean operating mode, pickups with very high output levels (humbuckers or active pickups) will evoke distortion at even lower settings. If you want squeaky clean tone, simply back off the Gain knob accordingly.
3 Lead Gain
Gain control for the Lead Channel. This Control knob determines input sensitivity when the Lead channel is active. Use it to dial in the desired amount of preamp saturation level.
CAUTION: Extremely high gain and volume levels in Channlel 2 mode can produce powerful feedback. Avoid feedback squeals; they can lead to hearing loss and damage speakers! At higher volumes, back off the Gain and Treble levels in order to prevent unchecked feedback!
4 Bright
This feature boosts the upper end of the high frequency range for the Clean channel. Its intensity decreases as gain settings increase.
A tip from the designer:
For a crisp or glassy tone, activate the Bright boost. It brightens the sound of humbucking or muddy pickups. Use it to tweak the amp's tone to taste, activating it to boost top-end frequencies for the Clean channel or deactivating it to dampen high end response.

5 Bottom
Alters the EQ by boosting the low end range; the Bottom feature affects the Clean Channel & the Lead Channel.

A tip from the designer:
If you want to ladle an extra helping of bottom-end oomph on specific sounds, I recommend that you activate the Bottom button. At very high Volume settings, it can be an advantage to deactivate this function for a more focused, crisper tone with precise definition in the lo end frequency range.

6 Bass
Bottom end voicing control of the preamps´s passive EQ.

7 Middle
Mid-range voicing control of the preamps´s passive EQ.

8 Treble
Upper range voicing control of the preamps´s passive EQ.

TIP´s from the Designer:
To help you get acquainted with the amp's fundamental sounds, I recommend that you set all tone controls to the center or 12 o'clock position.
For high Gain Lead sounds, your best bet is to turn the Treble knob well down to prevent the pickups and speakers from interacting at hi levels and generating feedback (the recommended setting is somewhere in the 10 to 2 o'clock range).
Since the Treble and Presence control knobs sweep through different frequency ranges and influence the signal at different places in the amp's internal signal chain, you can dial in different combinations of treble and presence settings to come up with many interesting sonic variations.

9 Lead Volume
Volume control for the Lead channel (pre-FX loop, influences the Send level). The red LED above the channel switching selector (11) indicates Lead operating mode.
Use this knob to dial in the desired balance of levels between the Lead and Clean channels.

10 Mid Boost
This voicing feature operates globally, affecting both channels by boosting specific midrange frequencies when activated. The LED above the button lights up to indicate Mid Boost is activated. It may also be switched using a footswitch connected to jack (20). When a footswitch is plugged in, the front panel Mid Boost button is disabled.

A tip from the designer:
Mid Boost targets and shapes specific midrange bands crucial in voicing a guitar's sound. This tone-shaping option is remotely controllable via footswitch, so you can adapt the amp's fundamental sound on the fly, say to better support rhythm guitar work, singing leads, and slashing power chords. With a handy MIDI switcher such as the ENGL Z-11, you can assign Clean/Lead channel switching, Master A/B, Mid Boost and the FX Loop off/on function to different MIDI presets and control these switching and sound-shaping functions remotely in any configuration using a MIDI footboard.

11 Clean / Lead
Channel selector pushbutton for Clean and Lead modes, red LED indicate Lead mode; This function can also be activated via the respective footswitch connected to jack 21.
Once a footpedal is connected, the channel selector pushbutton is deactivated.

12 Master A
Master volume A for power amp output (located post FX loop). The red LED next to the knob lights up when this knob determines the master volume level. Master A/B switching can be accessed via a footswitch connected to jack 21 (e.g. ENGL Z-4).

13 Master B
Master volume B for power amp output (located post FX loop). The green LED next to the knob lights up when this knob determines the master volume level. Master A/B switching can be accessed via a footswitch connected to jack 21 (e.g. ENGL Z-4).

Tip from the Designer:
You can dial in different levels for Master A and Master B, assign these settings to any channel, and access them directly via the two channel switches on the Z-4 foot controller. This gives you a range of alternatives that you can apply to different playing styles and musical genres to great dramatic effect. What's more, you can use the Clean channel for rhythm or cleaner lead lines and the Lead channel's overdriven preamp stage for power chords and soloing, and go from soft to loud at the touch of a button. Beyond that, you can also broaden the volume and tonal ranges by working your guitars' volume knob. If your arsenal includes MIDI gear - for instance, the Z-11 ENGL MIDI Switcher in combination with a MIDI Footswitch (e.g ENGL Z-9, Z-12, Z-15) - you may use the amp's Master A/B circuit to swiftly and conveniently set the power amp's volume to two different levels, and then access these volume presets in combination with preamp voicing features such as Mid Boost.

14 Presence
This control shapes the hi frequency response in the power amp stage and affects both channels.

15a Power Tube Monitor V1

This LED lights up when the current flowing through the V1 power amp tube is too high and the power tube monitor system has switched that tube off.
See the tube layout chart to locate V1's position on the amp chassis.

15b Power Tube Monitor V2

This LED lights up when the current flowing through the V2 power amp tube is too high and the power tube monitor system has switched that tube off.
See the tube layout chart to locate V2's position on the amp chassis.

15c Power Tube Monitor V3

This LED lights up when the current flowing through the V3 power amp tube is too high and the power tube monitor system has switched that tube off.
See the tube layout chart to locate V3's position on the amp chassis.

15d Power Tube Monitor V4

This LED lights up when the current flowing through the V4 power amp tube is too high and the power tube monitor system has switched that tube off.
See the tube layout chart to locate V4's position on the amp chassis.

An important note on the Power Tube Monitor (P.T.M.) system:
The electronic power amp monitoring system constantly gauges the current flowing through each power amp tube. If it rises to too high a level the system shuts down the given tube.
This can occur when the amp is operated incorrectly (for example, if the impedance is wrong due to an incorrect speaker load; refer to #26, #27 and #28 for permissible loads), at extreme power spikes, or when a tube is defective.
Reset this electronic monitoring system by switching the standby switch off and on again. When you press the standby switch to turn the amp on again, the system again measures the current sent to the tube. If it is still too high, the power amp must be checked by a service technician, and the tube may have to be replaced if it is defective.
IMPORTANT, PLEASE NOTE: do not flip the Stand By switch off and on in short time intervals if a P.T.M. LED indicates a tube failure. Let a few minutes pass by before you engage the poweramp again after you have switched it off.

16 Stand By

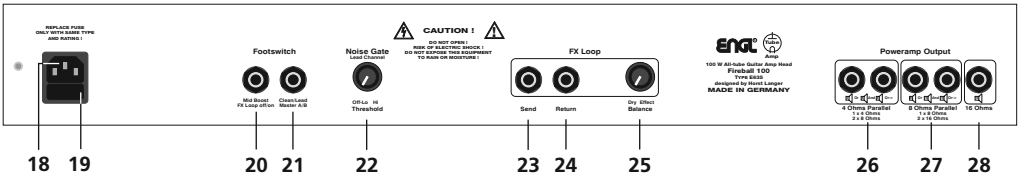
Power amp standby switch: Use this switch to silence (0 position) the amp when you take a lengthier break. The amp's tubes stay warm, which means that it is ready to roll immediately when you switch it back to full power. To reset the power tube monitoring circuitry, press the standby switch briefly (see Power Tube Monitor).

A tip from the designer:
I suggest you get into the habit of using standby during short breaks. In this mode, current is not piped through the power tubes, so they don't get as hot (due to the lack of anode dissipation) and are spared considerable wear. The amp is ready to run when you flip the Standby switch because the tubes are already warm and don't require time to heat up. For breaks of 30 minutes and longer, I recommend that you switch the amp off in order to conserve energy.

17 Power

AC power on/off.
Please note: ensure that the Stand By switch (17) is set to Stand By (0 position) before you switch the amp on. Let the tubes heat up for about 30 seconds before you activate the power amp. This procedure spares the tubes.
CAUTION: After an extended period of operation and higher ambient temperatures the amps's chassis can become very hot, therefore avoid touching the rear panel surface !

Rear Panel



18 AC SOCKET: (AC Power Inlet; IEC - C14 connector)

Connect an AC cord here.

CAUTION: Ensure you use an intact AC cord with an insulated plug only! Before you power the amp up, ensure the voltage value printed beside the AC socket corresponds to the available current.

19 AC Fuse Box

Contains mains fuse (rear chamber) and spare fuse (front chamber).

NOTE: Ensure replacement fuses bear identical ratings (refer to the table)!

20 Footswitch Mid Boost; FX Loop off/on;

Use this 1/4" Stereo jack to connect a conventional footswitch with two switching functions, for example, the ENGL Z-4 (2 x off/on - Single Pole Single Throw or SPST for short). This type of footswitch lets you access Mid Boost and FX Loop off/on. One of the two switches activates Mid Boost, while the the other activates the FX Loop. Plugging a footswitch into this jack disables onboard Mid Boost (10) switching.

Note also: A footswitch may be equipped with LEDs indicating the given switching status. Each of the two switches is provided with approx. 10 milliamperes current, which suffices to power a standard LED. The jack's mono terminal ("tip") selects Mid Boost (passive <–> active), while the stereo terminal ("ring") controls the FX Loop (off <–> on). For pin assignments, see "Wiring of Principal Connectors".

21 Footswitch Channel Clean - Lead; Master A - B;

Use this 1/4" Stereo jack to connect a conventional footswitch with two switching functions, for example, the ENGL Z-4 (2 x off/on - Single Pole Single Throw or SPST for short). This type of footswitch lets you access the two channels and Master A/B. One of the two switches activates Clean or Lead, while the other activates Master A or B. Plugging a footswitch into this jack disables onboard channel (11) switching.

Note also: A footswitch may be equipped with LEDs indicating the given switching status. Each of the two switches is provided with approx. 10 milliamperes current, which suffices to power a standard LED. The jack's mono terminal ("tip") selects Clean <–> Lead switching, while the stereo terminal ("ring") controls the Master A <–> B feature. For pin assignments, see "Wiring of Principal Connectors".

22 Noise Gate Threshold

This control knob activates an onboard Noise Gate serving to suppress excess noise in the Lead channel when you twist it to the right, near or just beyond the 9 o'clock position. Use this knob to set a threshold value (that is, the noise level) at which the Noise Gate activates to suppress the signal within the 9 to 5 o'clock range. The further you twist the knob to the right, the higher the signal level at which the Noise Gate kicks in. If you set the knob to the 5 o'clock position, the Noise Gate reacts to extremely high noise levels, meaning that there's not much of a margin between the guitar signal and background noise.

IMPORTANT note; please read and heed: The Noise Gate may open up inadvertently when the Noise Gate is activated, a high-gain Lead channel is selected, and the volume exceeds the Threshold knob setting. At very high volume and gain settings, this may generate instant feedback, particularly if your guitar is facing the speakers. Rather than musical and controlled, this is the shrill, unpleasant and potentially harmful variety of feedback squealing that sends your audience and fellow musicians packing. Though the amp is not more susceptible to feedback when the Noise Gate is activated, the fact that it suppresses extraneous noise means you can't hear those telltale signs that feedback is swelling and consequently can't take measures to suppress it. For this reason, make an extra effort to be careful when the Noise Gate is activated: Before you approach the amp and speaker cabinet with your guitar in hand, turn the guitar's volume knob to the far left position (to 0 so that no signal is audible) to prevent the pickups and speakers from interacting!

A tip from the designer:

Noise is a definite no-no in many situations. For example, studio etiquette demands that you keep a lid on extraneous noise during short breaks. It's in the nature of high gain rigs to generate undesirable peripheral noise in overdriven channels. This is attributable to the physical properties of an amp's constituent components, in particular its active components. That's right; those cherished tubes are the culprits. The Noise Gate is a tool that lets you silence this noise during breaks by way of signal mute circuit. Note that electric guitars pick up interference signals, and these are amplified tremendously at high gain levels in Lead mode.

22 Noise Gate Threshold: A Tip from the Designer - continuation

The most common source of noise is 50 Hz or 60 Hz (hertz/cycle) mains hum, particularly when the guitar is positioned near transformers and power units.
Because in worst-case scenarios this humming can attain extremely high levels, the Noise Gate can hardly distinguish between the musical signal and noise. This makes it hard to find the right Threshold setting. It is entirely possible for this humming and other noise to rise to a level that deactivates the Noise Gate and therefore becomes audible. My advice is to stay as far away from transformers and power units as space allows.

23 F.X. Loop Send

Connect the FX Loop output to a signal processor's input/return jack using the shortest possible shielded cord equipped with 1/4" plugs. Activate and deactivate it via a Footswitch connected to the Footswitch terminal 20. In the signal path, the FX Loop is located post preamp and pre the two power amp Master knobs.

24 F.X. Loop Return

Connect the FX Loop input to a signal processor's output/send jack using the shortest possible shielded cord equipped with 1/4" plugs. Activate and deactivate it via a Footswitch connected to the Footswitch terminal 20. In the signal path, the FX Loop is located post preamp and pre the two power amp Master knobs.

25 Balance

FX mix control for the FX Loop. When the knob is set to Dry, the amp signal is routed through with no processed signal (0% wet balance) added to the mix. Twist the knob clockwise to blend in the processed signal (parallel/passive, wet balance 1-99%, depending on knob position). When the knob arrives at the Effect position, only the wet signal (that is, the processed signal generated by the connected effect device) is patched to the power amp (serial, 100% wet).
NOTE: Set this knob to Dry when this loop is not in use!

26 Poweramp Output 4 Ohms parallel

4 ohms speaker output jacks, internal parallel signal path for the connection of one 4 ohms cabinet or two 8 ohms speaker cabinets.

27 Poweramp Output 8 Ohms parallel

8 ohms speaker output jacks, internal parallel signal path for the connection of one 8 ohms cabinet or two 16 ohms speaker cabinets.

28 Poweramp Output 16 Ohms

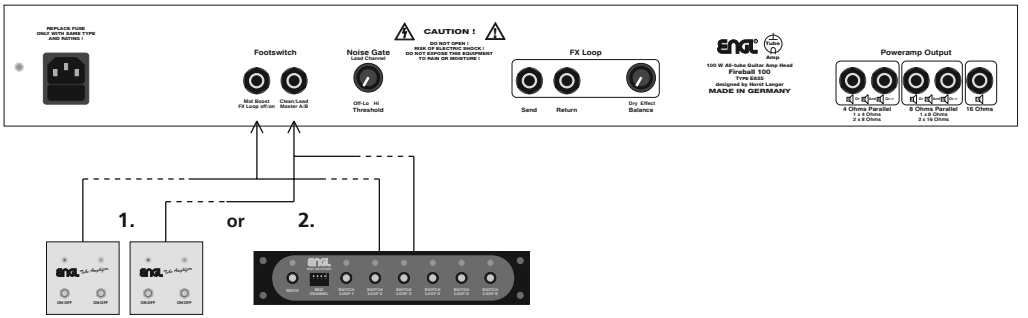
16 ohms speaker output jack, for the connection of one 16 ohms speaker cabinet.

NOTE: Never operate the amplifier without a sufficient load, otherwise you may damage or destroy the power amp! Ensure your cabinet's specifications match the respective output's specs.

Possible speaker cabinet options:

1. One 4-ohm cabinet connected to a 4-ohm jack;
2. Two 8-ohm cabinets connected to the 4-ohm jacks;
3. One 8-ohm cabinet connected to an 8-ohm jack;
4. Two 16-ohm cabinets connected to the 8-ohm jacks;
5. One 16-ohm cabinet connected to the 16-ohm jack;
6. An 8-ohm cabinet connected to one of the 4-ohm jacks in combination with a 16-ohm cabinet connected to one of the 8-ohm jacks;

The different options for controlling the Fireball 100 amp remotely:

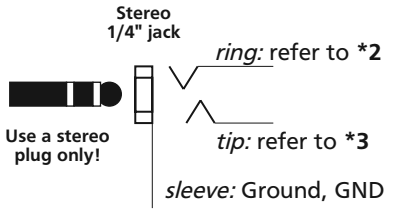


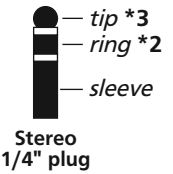
1. Two-way footswitch (e.g. ENGL Z-4): Connect it to the amp via a stereo ¼" cord. You will need one two-way footswitch for switching channels via Jack 21 and Master A/B another footswitch for switching Mid Boost and FX Loop off/on via Jack 20.

2. MIDI-Switcher (e.g. ENGL Z-11): Connect the unit to the amp via two stereo ¼" cords. The buttons on the Switcher controls Clean/Lead, Master A/B, Mid Boost and FX Loop off/on.
If you program the diverse switching configurations to different MIDI program locations (e.g. MIDI Preset #1: Clean channel & Master A & Mid Boost passive & FX Loop on; MIDI Preset #2: Lead channel & Master B & Mid Boost acive & FX Loop on, etc.) you can activate the desired configuration directly via a MIDI board (e.g. ENGL Z-9, Z-12 or Z-15). This type of control option is extremely versatile, we recommend it highly if you intend to use the amp in conjunction with a MIDI system (e.g. MIDI effects devices).

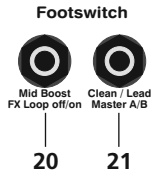
Wiring of Principal Connectors

Footswitch (20, 21)





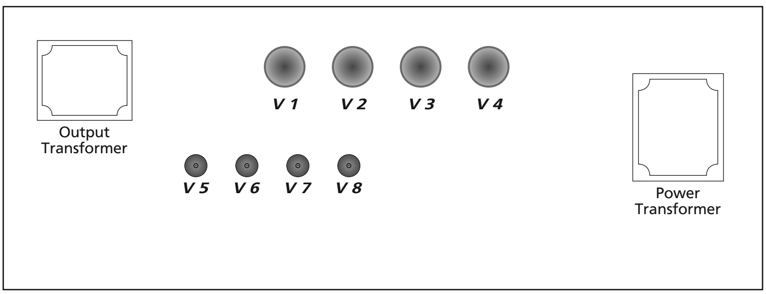
***2: A switch connected to this terminal controls**
FX Loop - off (bypassed) <–> on (enabled) via jack (20);
Master A/B - Master A <–> Master B via jack (21);
***3: A switch connected to this terminal controls**
Mid Boost - passive <–> active via jack (20);
Channel switching - Clean <–> Lead via jack (21);



Technical Data:

Rated power:		approx. 100 watts at 4, 8 or 16 ohms;
Input sensitivity level Input, Clean channel:		-20 dBV nominal, max. 0 dBV
Input sensitivity FX RETURN:		from -20 dBV to -10 dBV nominal, max. 0 dBV
Output level FX SEND, level range:		from -20 dBV to -10 dBV nominal, max. 0 dBV
Tubes:	V5:	ECC 83 / 12AX7 /7025, FQ selected;
	V6, V7:	ECC 83 / 12AX7 selected;
	V8:	ECC 83 / 12AX7, standard;
	V1 - V4:	6L6GC matched sets.
Fuses:	external:	1.6 ATL (slow) for the 230 Volt model; 3.15 ATL (slow) in the 100 and 120 Volt models.
(internal fuse located at the power transformer)	internal:	2 ATL (slow) for the 230 Volt model; 4 ATL (slow) in the 100 and 120 Volt models.
Important:		**Replace fuses only against same type and rating!**
Power Consumption:		300 watts max.
Dimensions:	(W x H x D)	approx. 71 x 27 x 27 cm; 28" x 10.6" x 10.6";
Weight:		approx. 21 kg; 46.3 lbs;

Tube array:



the tubes and their function:
V 5 - ECC83 (12AX7 or 7025): input stage, 2. stage; grade: FQ selected
V 6 - ECC83 (12AX7): Lead driver stage, 4. stage; grade: selected
V 7 - ECC83 (12AX7): FX buffer stage, poweramp driver stage; grade: selected
V 8 - ECC83(12AX7): phase splitter; grade: standard
V 1 - V 4: 6L6GC or 5881: power tubes, poweramp, matches sets

Tube replacement report:

1. Replaced on: _ _ _ _ _ _ _ _ 20 _ _ _ Replaced by: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Replaced tubes: _

Reason: _

2. Replaced on: _ _ _ _ _ _ _ _ 20 _ _ _ Replaced by: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Replaced tubes: _

Reason: _

3. Replaced on: _ _ _ _ _ _ _ _ 20 _ _ _ Replaced by: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Replaced tubes: _

Reason: _

Troubleshooting

*** The amp does not power-up after you have switched the power on.**
The control lamp inside the power switch (17) does not light.
-> Is the mains cord connected to the receptacle / live power source ?
-> Is the power cable you are using intact ? Try another equal mains cable.
-> Is the mains lead properly connected to the AC Power Inlet (18) at the amp ?
-> Possibly the mains fuse (19) has blown, unplug the mains cord from the mains connector and the receptacle and check the mains fuse.

*** The amp does not power-up after you have switched the power on. The control lamp inside the power switch (17) lights up but the Channel & Mid Boost switching functions do not react, i.e. the corresponding control LED's do not indicate an active function; moreover no sound is emanating from the connected speaker.**
-> Possibly the internal mains fuse has blown. Let this fuse check by a professional technician.

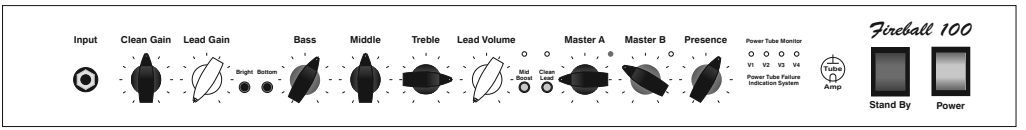
*** The amp fails to respond when you try to control switching functions remotely using a footboard such as the Z-4 or a MIDI switcher such as the ENGL Z-11.**
-> Are the footboards or switching loops connected to the corresponding footswitch jacks (20, 21) ?
-> Are the cords you are using stereo, intact, and wired properly ?
(Refer to "Wiring of Principal Connectors" for pin assignments.)
-> If you are using footswitches other than an ENGL Z-4 or Z-11, are the switches or relays inside the boards or switching loop systems off / on Single Pole Single Throw (SPST) switches? In other words, do these switches continuously connect to GND when you wish to activate the given function?
If you're unsure about the answers to these questions, consult an authorized service center or a professional specialist.

*** The amp is not providing an output signal / no sound is emanating from the speaker.**
-> Is at least one speaker connected to the speaker outputs 4 ohms, 8 ohms or 16 ohms (26, 27, 28) ?
-> Is the power amp activated (Standby switch to ON) ?
-> Are all cords (guitar, effect, and speaker) connected properly and are they functional ?
-> Unplug connected effectors and see if the preamp works fine without these peripheral devices.
-> Is the Noise Gate activated in the Lead channel and the Threshold (22) knob set to a high value?
Deactivate the Noise Gate (22) for a quick check.
-> Are the active Master knob and the Gain and Volume knobs set to a value greater than 0 ?
If any of these knobs is set to 0, no signal is routed to the amp's outputs.
-> You may be looking at a faulty tube or another defect. In this case, be sure to take the preamp to an authorized, professional service center.

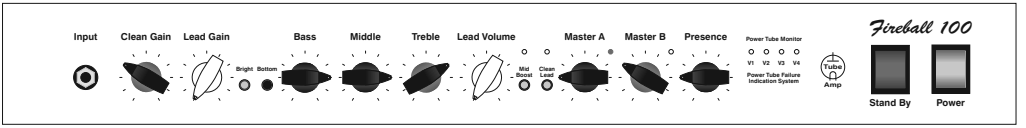
*** The speaker is emitting humming noises:**
-> Is there a connection (for example, via a shielded circuit) between the amp and another device that is grounded via a power plug of its own?
Two or more circuits sharing a common electrical ground line can cause audible hum.
If low-frequency noise is emanating from your rig, be sure to consult a specialist.
-> The amp and mains grounds are not connected properly or are altogether disconnected.
Have an experienced specialist check this.
-> Cords connected to the input or effect loops may not be shielded properly.
Replace them to check if this is indeed the case.
-> The amp or speaker cords may be picking up interference from powerful magnetic fields (for example, of nearby power transformers or electrical motors).
Reposition the amp and connector cables.
-> The amp or speaker cords may be picking up radio signals, for example, from activated mobile telephones or powerful local transmitting stations nearby.
Switch off mobile phones while troubleshooting noise problems.

*** The electronic power amp protection circuit has tripped:**
-> The given power tube is defective and must be replaced if the electronic circuit breaker continues to trip after several attempts to reset the Tube Monitoring System by flipping the Standby switch off and back on again.
IMPORTANT, PLEASE NOTE: do not flip the Stand By switch off and on in short time intervals if a P.T.M. LED (15a-d) indicates a tube failure. Let a few minutes pass by before you engage the poweramp again after you have switched it off.
-> The amp has been overloaded, perhaps by excessive volume levels, mains over-voltage, or the wrong output impedance (the impedance setting does not match the connected speaker's impedance).

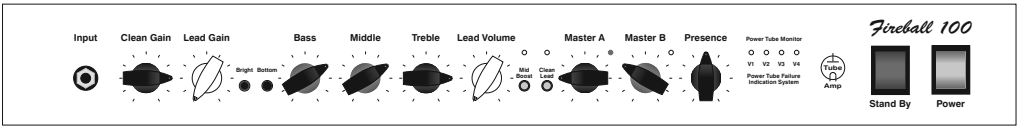
Sound setting samples - Clean channel



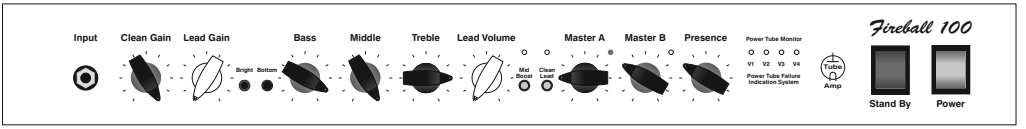
Sound sample 1: Crystal Clean



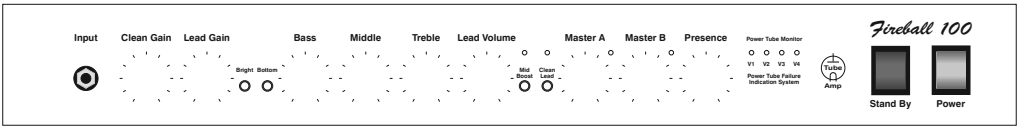
Sound sample : Jazzy Whispers Clean



Sound sample : LA Hairy Clean



Sound sample : Blues Crunch



your own setting:

Explanations:

control settings does not care, LED´s are not lit.

control setting for the described sound sample; LED is lit.

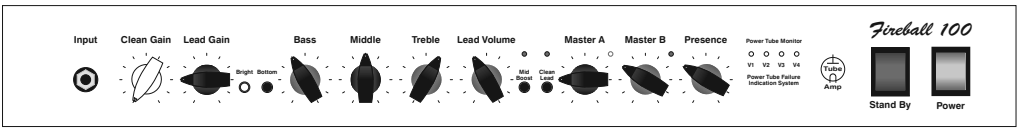
○ **button setting does not care.**

◉ **button in Off position.**

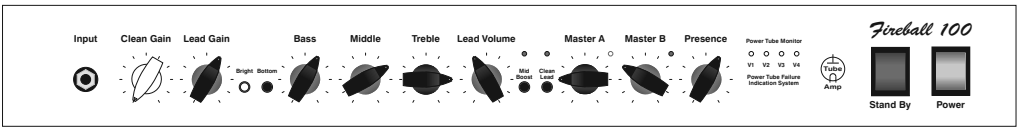
● **button in On position (pressed).**

Sound setting samples created by: Bernd Aufermann

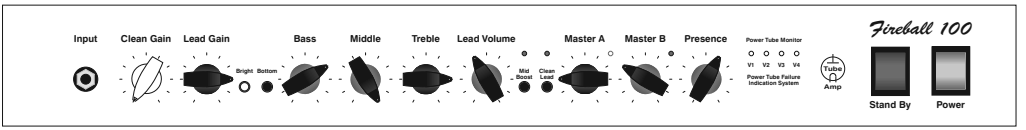
Sound setting samples - Lead channel



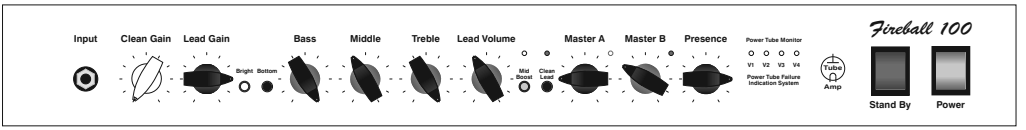
Sound sample : Vintage Blues Crunch



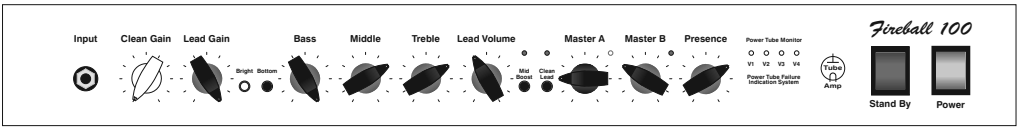
Sound sample: Rock Rhythm



Sound sample : Rock Lead



Sound sample : Heavy Metal Rhythm



Sound sample : Metal Lead

Explanations:

control settings does not care, LED´s are not lit.

control setting for the described sound sample; LED is lit.

- ○ **button setting does not care.**
- ◉ **button in Off position.**
- ● **button in On position (pressed).**

Sound setting samples created by: Bernd Aufermann

Handling and Care

* Keep the amp safe from hard knocks and shocks. Tubes are fragile and tend to suffer when exposed to mechanical stress!
* Let the amp cool down before you transport it. Ten minutes or so will spare the tubes.
* Tubes take some 20 seconds to warm up after you switch the power on, and about two to three minutes before they are able to pump out full power. Make a habit of giving your amp plenty of time to get toasty and flipping the Standby switch for short breaks.
* In order to spare the power tubes and prolong their lifetime, we recommend to set the Stand By switch to Stand By (0 position, that is) before you switch the amp on. After a period of 30 seconds you may activate the poweramp by flipping the Stand By switch.
* Avoid storing the amp in damp or dusty rooms to spare jacks, switches and potentiometers. If you don't use the amp all the time, I recommend that you drape a covering over it to prevent the intrusion of dust. Even better, keep it in a transport cover or flight case.
* Never use caustic or scouring detergents to clean the amp's housing, front or rear panels. Use a soft, damp cloth or sponge with diluted soapsuds or a standard brand of mild dishwashing liquid instead. Never use solvents they can corrode the amp's vinyl skin and dissolve the front and rear panel labels. Keep liquids well away from the amp, particularly the interior of the housing.
* Make sure air can circulate at the front and top of the amp to allow for adequate cooling, which increases component life.
* Never operate the amp without an adequate load (a speaker, cabinet or suitable terminating resistor).
* High ambient temperatures place an additional strain on diverse components; so if at all possible, avoid operating the amp at temperatures far higher than 30°C for longer periods. Running the amp at mains voltages exceeding the nominal mains input voltage over longer periods can also shorten component life.
* Replace tubes with selected tubes that satisfy ENGL selection criteria to forestall microphonic properties, undesirable noise and unbalanced power amp signals. Because power tubes' idle current (bias) must checked and possibly adjusted when replacing tubes, this is a job best left to experienced and authorized specialists.

CAUTION! Please read and heed the following:

You'll find an ancillary pamphlet accompanying this owner's manual entitled Instructions for the Prevention of Fire, Electrical Shock and Injury.
Be sure to read it before you plug in and power up the amp!

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Text, design, graphics and layout by Horst Langer

We reserve the right to make unannounced technical upgrades!

Notes / Notizen

ENGL®

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