

HOW TO ADJUST BASS DRUM PEDALS and OTHER INTERESTING PEDAL STUFF

Sometime ago, I received an email from a drummer who asked how to adjust his bass pedal to make it faster. I gave him a quick answer and said to myself, "Hey, this would be a great topic for a Tech Speak article!" So here it is: HOW TO ADJUST BASS DRUM PEDALS and OTHER INTERESTING PEDAL STUFF.

Plain or with Peanuts

Like most things: cars, computers, stereos, and candy bars, pedals come in plain and fancy versions. Generally, the higher the price, the fancier the pedal with more bells and whistles attached. However, even the plainest pedals have two fundamental adjustments: spring tension and beater height.

SECTION 1: BASIC ADJUSTMENTS

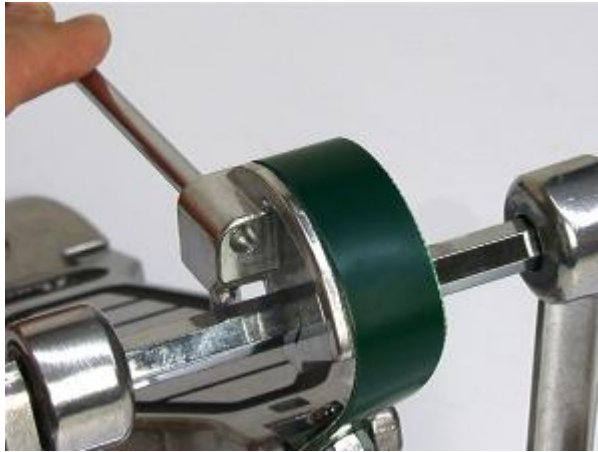
Beater Height

Without getting into physics (which I can't explain anyway), the height of the beater influences the amount of (potential) power it can deliver. Set low, like choking a baseball bat, the power potential is limited; oppositely, set high, like holding a bat at the end of the grip, the potential power is increased.

I'm of the mind that you can always throttle back a race car but you can't win the Indy 500 with a Pinto. Likewise with pedals, you can always control excess power but you can't get more (power) if there isn't any to begin with. For this reason, I prefer to go for the gusto and set the beater for maximum power, that is, pretty much as high as it'll go. Actually, I leave about 1¼" of the beater rod showing to allow for fine tuning later.



For starters, set the beater on you pedal with about 1¼" of the rod showing, as shown above.



To avoid damage to your pedal, it's advisable not to set the beater too high, like the example above. If you need extra beater height, it's better to invest in a taller beater.

Spring Tension

How tight or loose you set your spring is closely related to your playing style. For example, if you're a "heel-up" player, you probably need more spring tension (or a more powerful spring) to compensate for the weight of your leg. On the other hand, if you're a "heel-down" player, you probably can get by with less spring tension as only the weight of your foot needs to be counterbalanced.

To determine a "ball park" spring tension, try the following. Attach your pedal to the bass drum and set the spring to an arbitrary setting. Put your foot on the pedal in the manner you normally play, either heel up or heel down, and **COMPLETELY RELAX**. If the beater is pressed into the bass drum head, the spring tension is probably too loose. If the pedal doesn't yield to the weight of your foot/leg and feels like an exercise machine, the spring is probably too tight. For many, the spring tension is about "right" if the beater is about 4" from the head with your body in this relaxed state. Adjust the spring tension as necessary to achieve this distance and test the feel by playing. Fine-tune the spring tension as needed to your preference.



For many, the spring tension is about "right" if the beater is about 4" from the head with your foot relaxed on the pedal.

Fine-tune Beater Height

After dialing-in the spring, you can make micro-fine adjustments to the feel of the

pedal by moving the beater up and down in 1/16" increments. Increasing the height of the beater will make the pedal feel increasingly top-heavy while lowering the beater will increase the apparent strength of the spring. These changes are subtle and your feet have to be pretty sensitive to feel the difference, nevertheless, I recommend trying this. Who knows, this little tweak may be just what your pedal needs to go from feeling good to feeling great!



Raising the beater even a small amount like 1/16" will change the feel of the pedal and make it feel slightly more top-heavy.



Lowering the beater even as little as 1/16" will change the feel of the pedal and make the spring feel stronger.

Beater Weight & Springs

As with sticks and mallets, beaters come in different weights with the heavier ones packing more power potential than lighter ones. As beaters become heavier, beefier springs are required to counterbalance the added weight. If your spring is "maxed-out" visit your local drum store and invest in a stronger spring.



If your spring isn't tight enough even though the spring tension adjuster is as tight as it'll go (like the one in the picture), it's time to get a stronger spring.

SECTION TWO: ADVANCED ADJUSTMENTS

Beater Angle

When you get beyond pedals with only spring tension and beater height adjustment, you get into a new class of pedals with extra bells and whistles. One of the coolest bells (or is it a whistle?) is the ability to vary the distance of the beater from the bass drum head.

On simpler designs, this is accomplished by moving a screw and "bobbin" to evenly-spaced threaded holes on the rocker cam. While this system works OK, you have to live with the factory-determined beater angles.



An example of screw and "bobbin" beater angle adjustment system. From left to right: the forward most hole moves the beater closest to the drum; the next hole moves the beater further back; the next hole moves the beater further back still; and so on. With this system, the beater angle moves in "steps."

On more advanced designs, the beater angle is infinitely adjustable thus allowing you to position the beater exactly where you want.



Pearl's PowerShifter Eliminator allows the beater angle to be adjusted infinitely for exact beater placement.

In general, setting the beater further away from the head enables more power (like taking a big swing in baseball) while moving the beater closer to the head tends to limit power. OK, there may be some of you who have a Bruce Lee-type power-kick and can develop maximum power with the beater set 1" from the head but for the rest of us a longer stroke is usually necessary to attain power. When it comes to how far or close the beater should be set relative to the head (or any pedal adjustment for that matter) there's no right or wrong. Make your adjustments according to your preference.

On most pedals, you'll notice the spring tension getting stronger as you set the beater away from the head and weaker as it approaches the head. After adjusting the beater angle, you may need to readjust the spring tension to compensate for this effect. On some pedals, the beater angle adjustment is independent of the spring thus the spring tension stays the same regardless of beater angle.

Footboard Angle

On many pedals the steepness of the footboard is adjustable by moving the end of the chain or strap to different positions on the cam thus allowing you to choose the footboard angle that is most comfortable.



Highest footboard angle



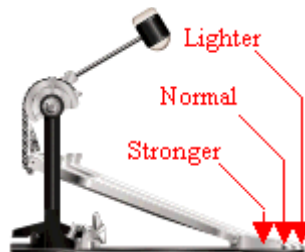
Middle footboard angle



Lowest footboard angle

PowerShifter

For extra versatility, Pearl's patented PowerShifter feature allows the entire footboard to be moved a step in front and a step behind the factory default (normal) setting. Moving forward decreases the footboard's leverage thus giving the pedal a stronger feel. Moving backward increases the footboard's leverage and makes the action feel lighter.



Balancing Double Pedals

Balancing the action between the two sides of a double pedal is usually a hit or miss proposition. However, with the sure-fire method below (thanks to Dom Famularo), you can achieve balanced double pedal action quickly and easily in minutes!

Here's how. Assuming that you're happy with the settings on your main pedal, set the "slave" pedal to match it as identically as possible. Make sure that the universal joints on the drive shaft are well lubed to eliminate as much friction as possible.

1) With your feet, depress both footboards until the beaters hit the drum head equally (as demonstrated below).



2) Release the footboards cleanly at the same time as shown below.



3) Observe how the beaters oscillate. If the slave beater is oscillating slower than the main beater, tighten the spring. If the slave beater is oscillating faster than the main pedal, loosen the spring. In the photo below the beaters are oscillating at different speeds.



4) The action of the pedals will be balanced when both beaters

oscillate "in-phase" with each other for as long as possible.



NOTE: Don't expect the slave pedal to oscillate for as long as the main pedal. So far no one has figured a way to make both pedals truly equal by overcoming the extra friction from the drive shaft, two sets of axles, and extra bearings. Of course, you can set the slave pedal tighter or looser than the main pedal; it's your call.

SECTION THREE: OTHER PEDAL TIDBITS

Basically, the most common pedal adjustments are covered above and I hope that you find them helpful. However, if you try everything and your pedal still doesn't feel as you think it should, your pedal may be at fault. The following are tidbits of pedal info that may help guide you on your next pedal purchase.

Cams

Of all the parts on the pedal, the cam or more precisely the shape of the cam has (arguably) the most bearing on how it feels and plays. Cams vary in shape from manufacturer to manufacturer but basically they fall into two types: linear and eccentric cams.

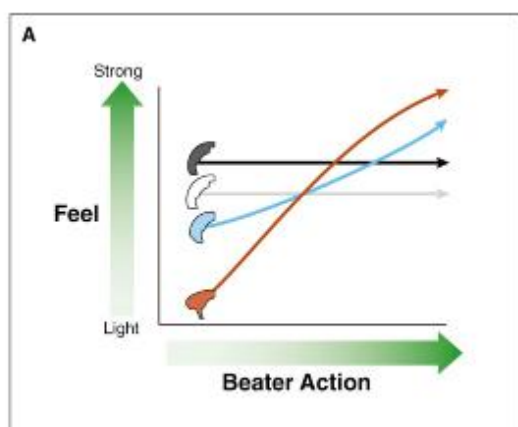
Linear cams are commonly round or round with a truncated side with the axle of the pedal mounted dead center. Some pedals feature a "lever-type" extension from the axle that works in a similar manner. Pedals with linear cams have essentially the same feel from the start to the end of the stroke. All things being equal, the larger the diameter of the linear cam, the more leverage it will have and the "lighter" it will feel.

The classic eccentric cam is shaped like a nautilus. Compared to linear cams where the radius is the same from the center to the outside edge, the radius of the nautilus-shaped cam is greatest at the tip of the cam and gets smaller toward the axle. This change in radius causes the leverage to change from strong to weak as the beater approaches the head. Inversely, you feel the resistance of the pedal going from light to heavy as the beater approaches the head. With eccentric cams, you can set the spring tension to deliver maximum return at the end of the stroke (where it's needed most) without having to fight the spring at the start of the stroke.

So, which cam is best? You can find out by trial and error or you can check out Pearl's new PowerShifter Eliminator pedals. The Eliminator offers four interchangeable cams so you can instantly change from one to another to achieve the feel that's best for you. It's like having four different pedals at the gig at the same time! Each Eliminator comes with two linear cams: BLACK, the traditional Pearl cam and WHITE, a larger cam with lighter feel; and two eccentric cams: BLUE, a modified nautilus shape and RED, the classic nautilus shape cam. Double Eliminator pedals come with two complete sets of cams thus you can mix and match cams on the right and left pedals for similar or completely different feel and performance characteristics! VERY COOL!



The PowerShifter Eliminator pedal featuring Pearl's patented interchangeable cam system.



The relationship between cam shape and feel.

Chains, Straps, Clothesline?

A friend of mine broke the metal link on his Speed King pedal and replaced it with a piece of clothesline. He said that the speed and action was better than ever before!

No, clotheslines won't be the next big thing in pedals but I bring this up because (to me) it doesn't matter what type of "drive" a pedal has (chain drive, strap drive, or clothesline drive) just as long as it works and is dependable.

Speaking of dependable, the king of dependability and popularity is the chain drive (invented by Al Duffy of Pearl). They can be noisy (a grrrr-grrrr sound) however when used with toothed cams. Toothless cams, such as Pearl's and some others, run completely silent thus are the logical choice for recording.



Pearl's silent and smooth toothless cam with dual chain drive.

Strap drives rate next in popularity. In the old days, leather was used but it stretched and broke easily. These days, nylon, Kevlar¹, and composite straps make strap drives almost if not as dependable as chain drives. The smoothness and quietness of strap drives is appealing to some drummers.



The PowerShifter Eliminator's features a 3-ply Super belt for chain-like dependability.

The Ghost pedal, Speed King, and Axis come to mind as pedals with solid link drives. Because there's no slack in the drive, the footboard and beater move in perfect tandem thus making these pedals favorites of those who demand absolute precision.



The Speed King is a great example of pedal with a solid link drive. Probably every drummer has played one of these in his or her career at sometime!

The choice of drive system is personal. If you're not sure of which to get, check out the Eliminator J. With the Eliminator you can switch from chain to strap drive or vice versa without having to buy a new pedal! All you need is the replacement chain or strap, a screwdriver, a drum key, and about two minutes.



The PowerShifter Eliminator accepts both chain or belt. You can retrofit one to the other in a couple of minutes with only a screwdriver and drum key.

Hoop Clamps

Newer designs have offset hoop clamps that allow the footboard to go practically flat.



The PowerShifter Eliminator features an offset hoop clamp that allows the footboard to be angled practically flat.

Some older designs, however, have the hoop clamp and wingbolt directly in the footboard's path. If set too low, the footboard and clamping device may collide resulting in possible damage to the pedal.



The author's trusty old Camco pedal with a chunk of the footboard (shown by the arrow) missing from repeated collisions with the wingbolt.



If you have this type of pedal and want a lower footboard angle, try substituting the wingbolt with a set screw as shown above.



Or a key bolt.

Footboard Size

If you want speed (and who doesn't?) choose a pedal with the smallest footboard that can do the job. With less mass than larger footboards, smaller footboards are not only faster but will stop and start with greater precision thus allowing you to play intricate patterns with relative ease. However, if you have big feet, go with a footboard that fits.



The Pearl P-201P (left) and P-101P (right) PowerShifter pedals showing different size footboards. As they say, "Different strokes for different folks."

Toe Stops

Toe stops are useful for keeping your foot from sliding or to have something to push

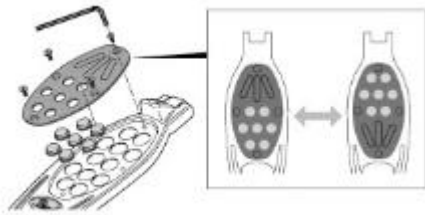
against for more power. Most toe stops are removable so they can be taken off if not needed.



The toe stops on PowerShifter Eliminator pedals are removable if desired.

Grip Tape

If you find toe stops confining yet want more slip-resistance on your footboard, grip tape (like the sandpaper stuff used on skateboards) works well. Better yet, the Eliminator pedal's unique Traction Plate gives you the option of customizing the zones of slickness/grip on the footboard without buying anything extra. The Traction Plate features a grippy side and a slick side that can be rotated to place either end at the toe or the ball of your foot for traction control where needed.



The PowerShifter Eliminator's Traction Plate and Traction Dots.

THE END

I'm sure I'll think of something that I missed, but for now I'm done. If you made it to the end of this article, I thank you and I hope that the information above is useful to you!