

# Determine Underlever Center Height Using Half Stroke Principles

The Half Stroke Gauge is an alternative method of arriving at the underlever center height.

In theory, the underlever spoon should pick up on the key end felt so that half way through the travel of the underlever spoon, the spoon pickup point, the balance point of the key and the under lever center should fall on a straight line.

This method is more elaborate, and somewhat more difficult. However, when the job is done, at least in theory, it should be better.

One thing that confuses many people, half stroke between the underlever and the key occurs at three quarter travel of the key.

Why three quarter travel of the key? Why not half?

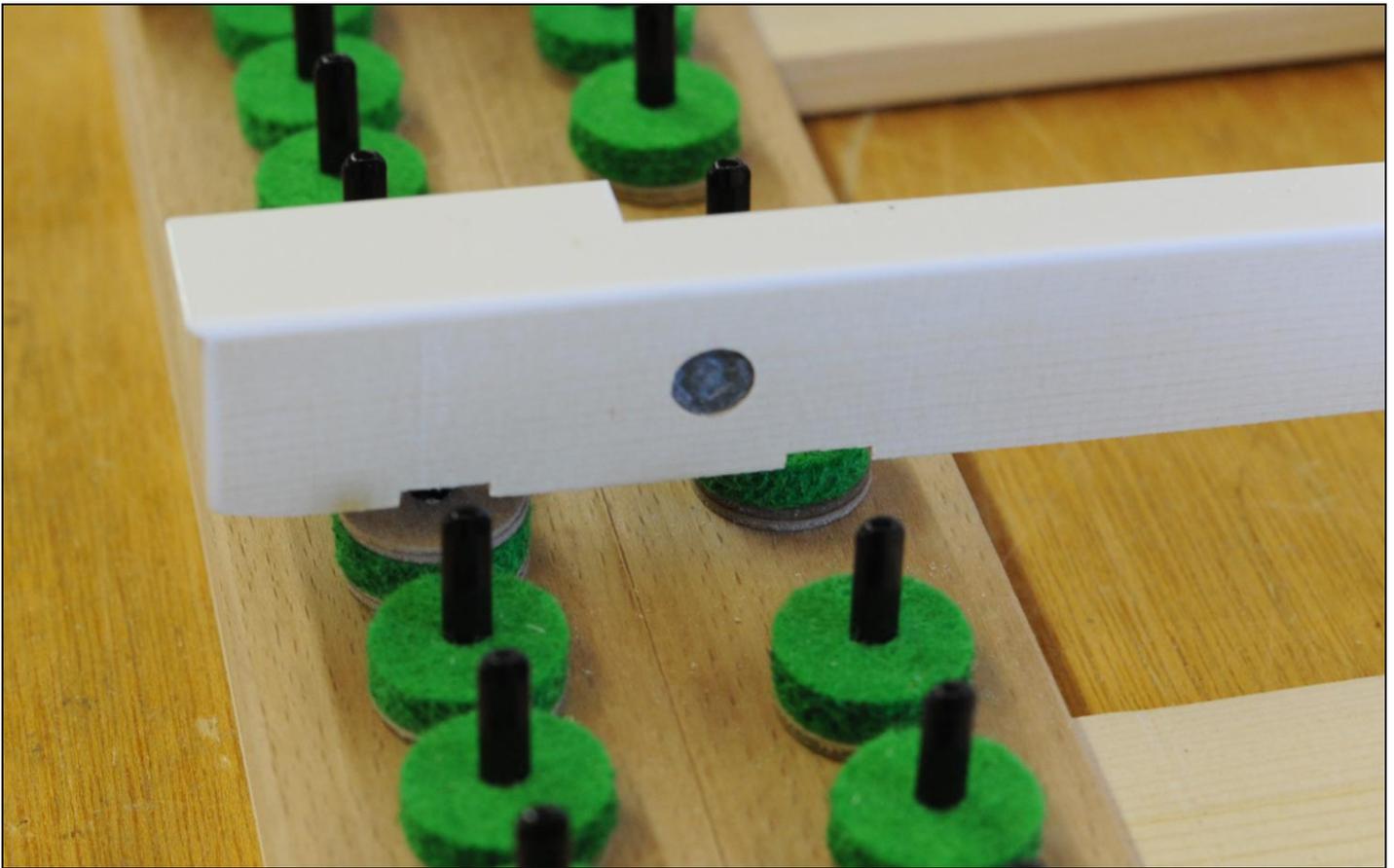
The relevant principle is that half stroke concerns only the portion of travel that the two lever arms are in contact.

Half stroke between the key and repetition occurs at half the travel of the key because the two levers are in contact throughout their entire travel.

Half stroke between the key and the underlever is not the same as between the key and the repetition.

The key comes into contact with the underlever spoon halfway through its travel. Therefore, half the stroke of the underlever occurs at three quarters of the travel of the key.

WNG has designed a tool to allow the sophisticated rebuilder to accomplish this end in a straight forward manner.



For this method, remove all keys from the keyboard but a white key in the middle of the keys that lift dampers. For ease of working, pick a B or an E key. The key should be set to the correct level and dip. The felt you wish to use should be attached to the key where it picks up the damper spoon.

Place cardboard and paper punchings over the cloth front rail punching that add up to  $\frac{1}{4}$  of the travel of the key. This places the key at  $\frac{3}{4}$  of its travel.

Since you need a shim that holds the key at  $\frac{3}{4}$  of its travel, the shim should be  $\frac{1}{4}$  of the key dip. Thus, to arrive at the correct shim thickness, you would multiply the key dip you intend to use by .25.

So, in inches, a .390 dip multiplied by .25 should equal .098".

In metric, a 10mm dip would yield 2.5mm.

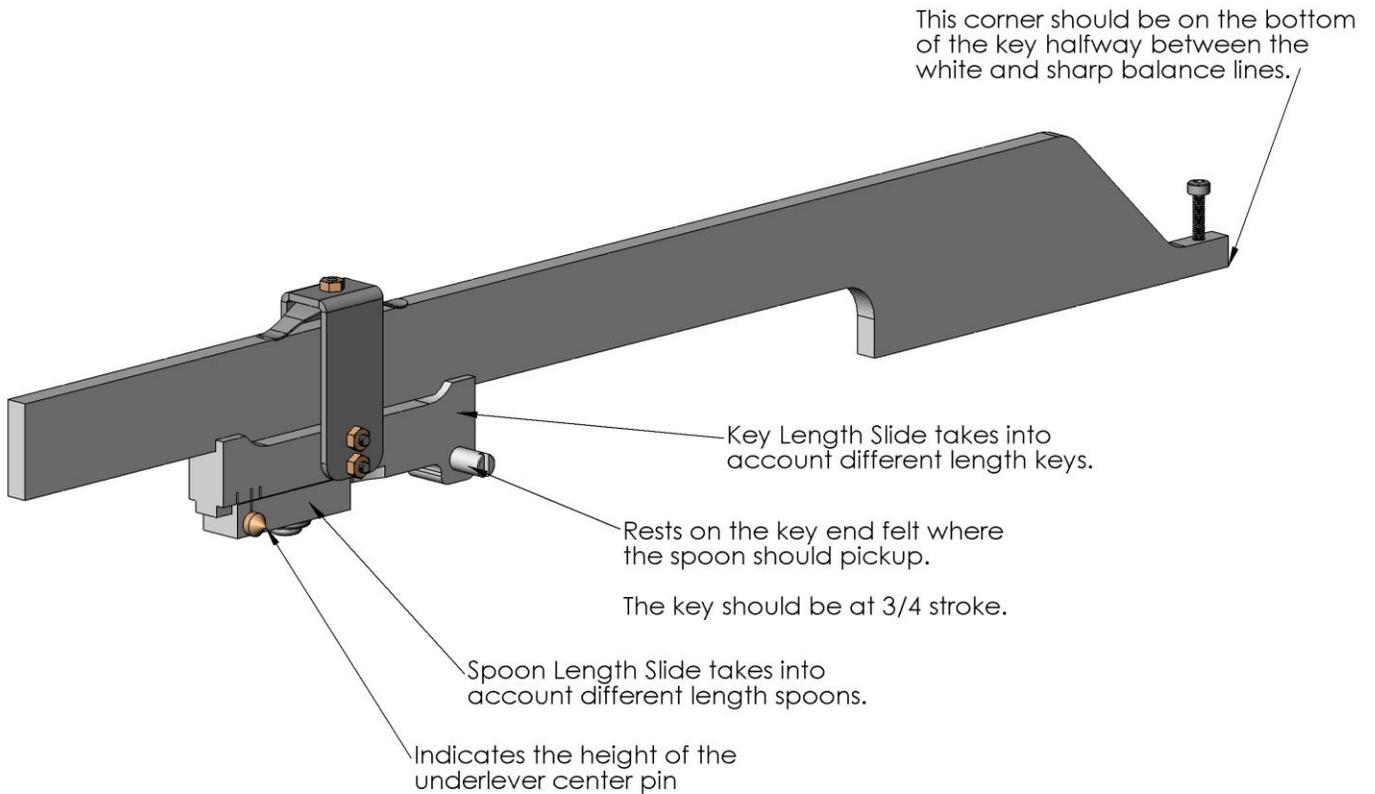
All you need do is get the correct number of front rail punching to add up to the calculated dimension and place them top of the cloth front rail punching.

Put a weighted keydip block on the key to hold it in place.

# Damper Pickup Half Stroke Gauge

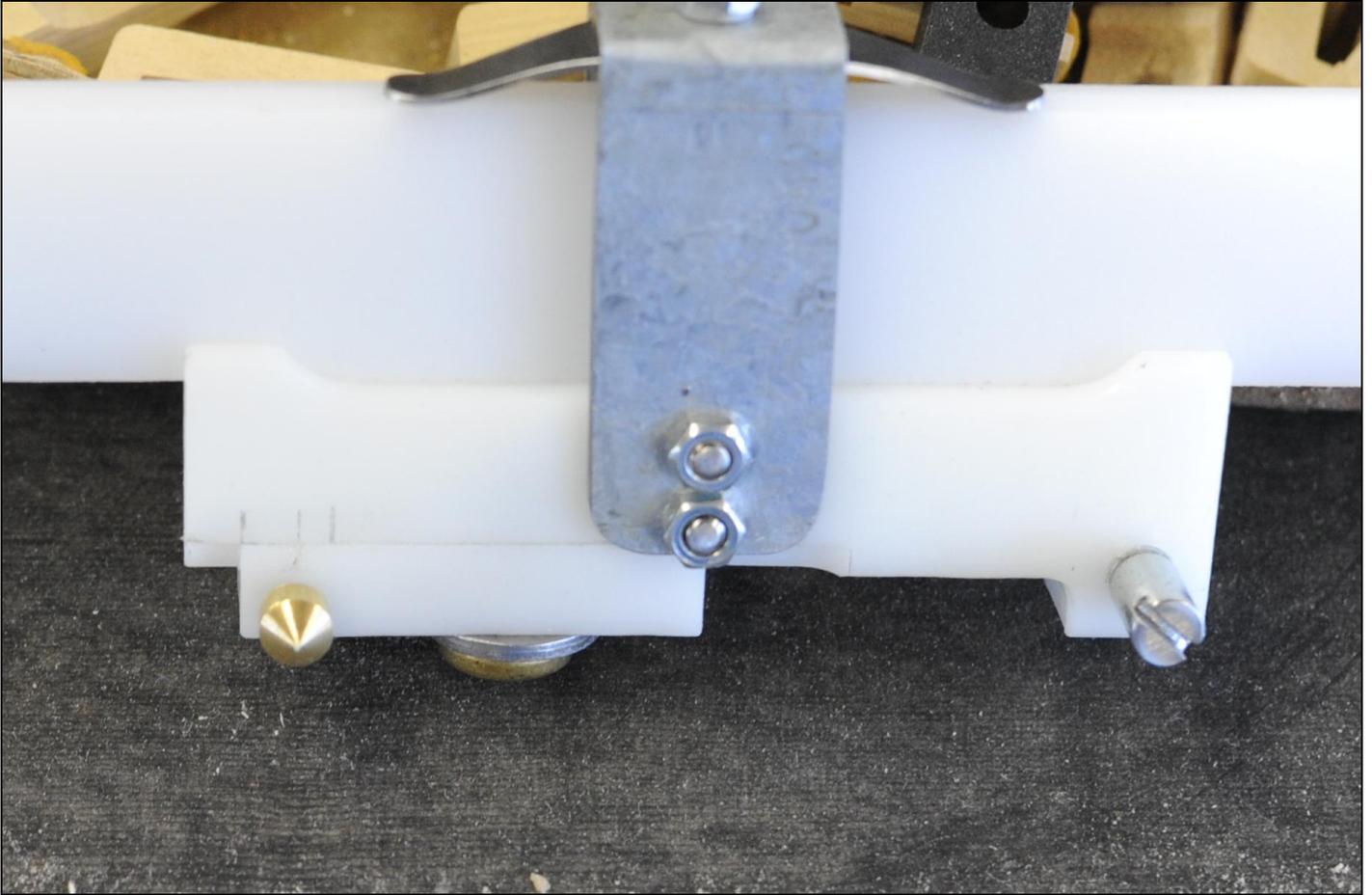
In theory the height of the underlever center pin should yield a half stroke relationship for the spoon pickup to the key.

This tool makes it easy to achieve that relationship.



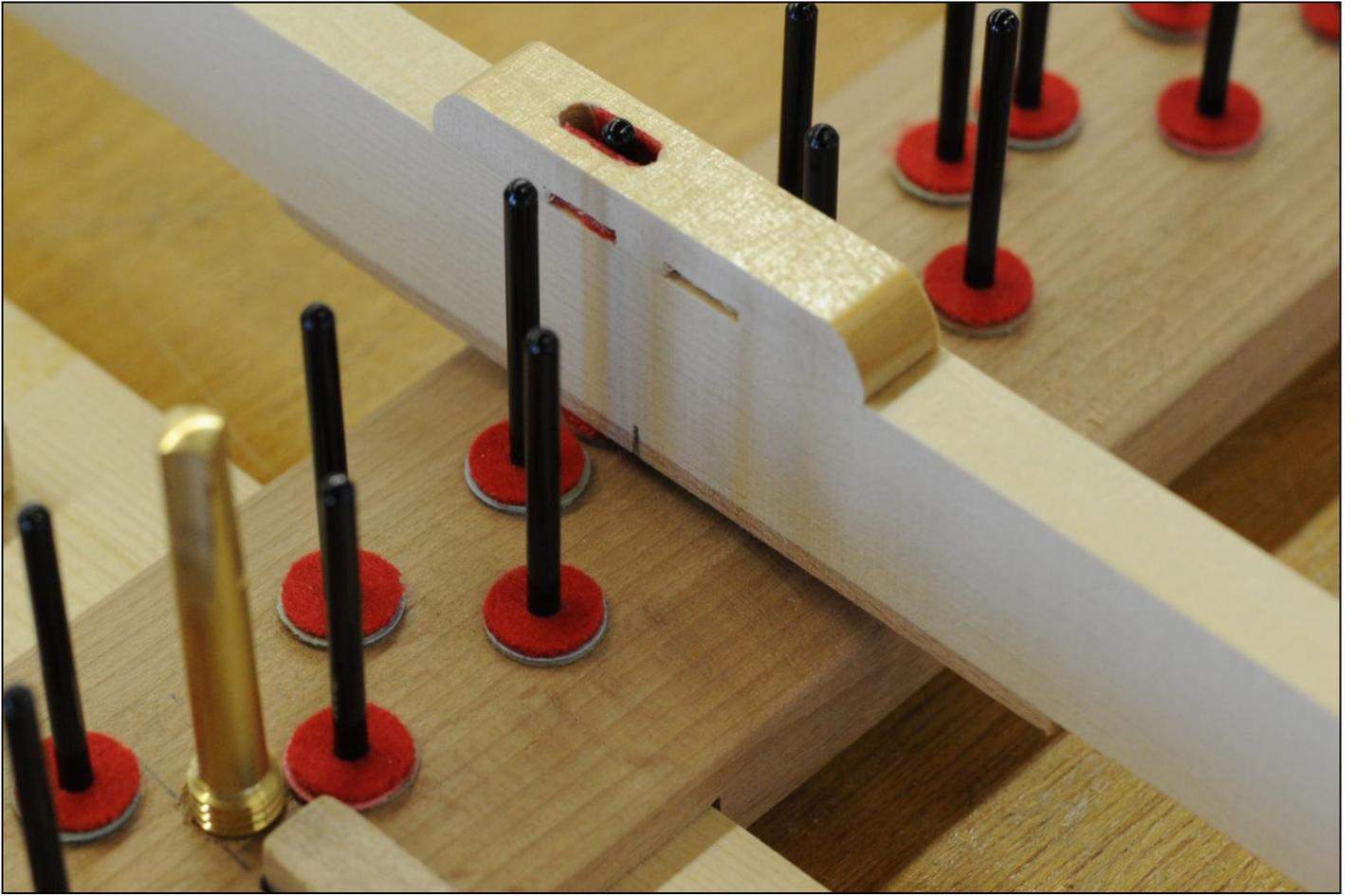
This tool allows you to set the damper action at the right height so that the underlever center pin falls on a straight line from the balance point

of the key through the pickup point on the key end felt when the key is at  $\frac{3}{4}$  stroke.



Just above the brass pointer there are three marks that correspond to the three spoon lengths available from Wessell, Nickel & Gross. This allows the jig to take into account the differing spoon lengths found on WNG underlevers. The mark closest to the metal bracket is for the Short Spoon, the mark in the middle is for the Standard Spoon, and the mark farthest from the metal bracket is for the Long Spoon.

Move the pointer so the marks are aligned for the length of spoon you are using.



Mark the side of the key halfway between the white and sharp balance lines.

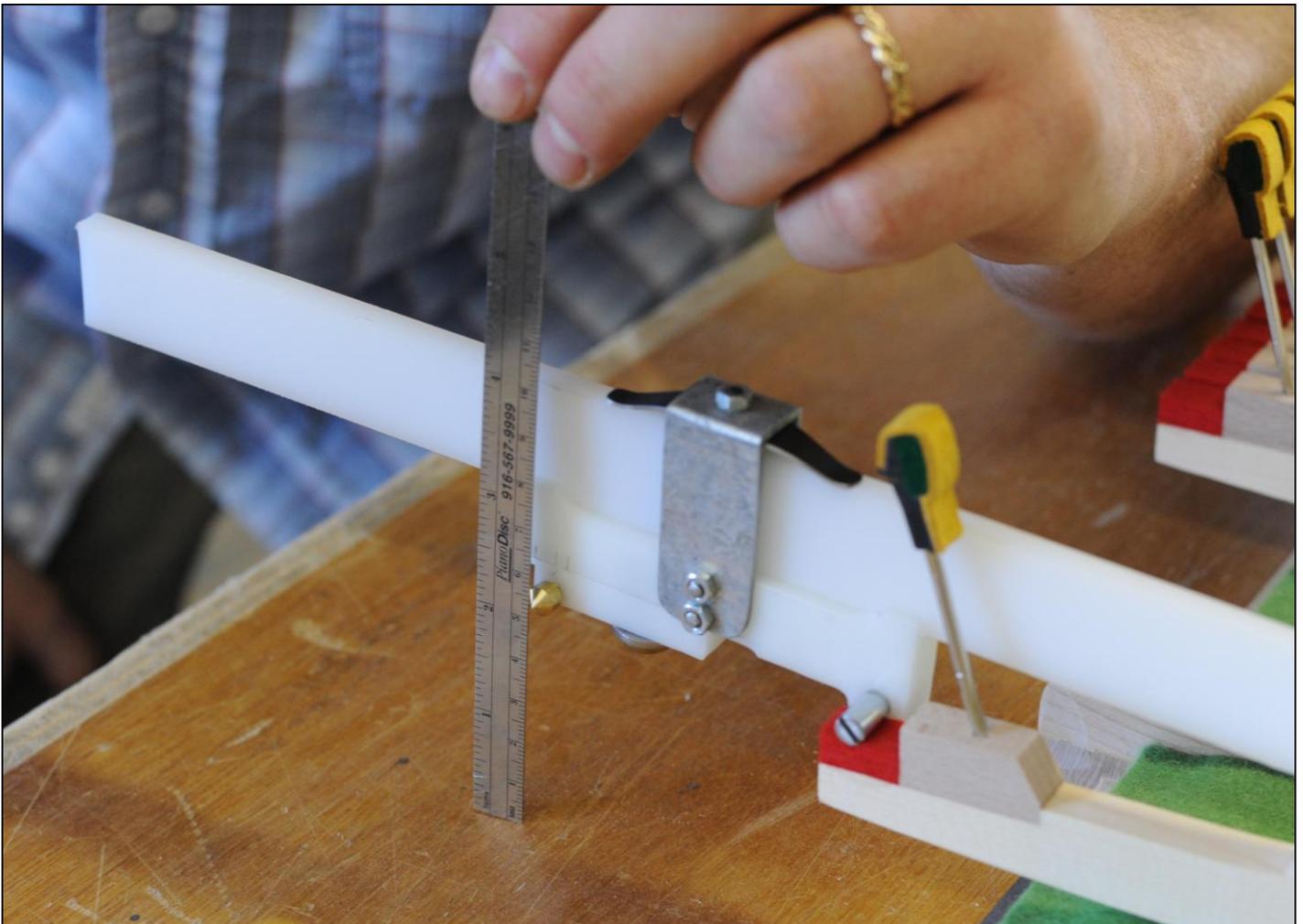


Place the gauge so that the front edge is halfway between the white and black balance pin holes. This is done so that the half stroke line is averaged between the sharp and white keys. Adjust the screw so that the bottom of the gauge is even with the bottom of the key.



Move the entire slide so that the cylindrical part rests on the key end felt on the spoon pickup point.

When all of the above things are complete, the pointer will give you the height of the underlever center.



Use a machinists rule to measure the height from the bench to the pointer. A millimeter ruler is best however you can use any ruler with sufficiently fine marking that you prefer.

This is the *Under Lever Center Height* dimension.

### **Caution!**

This method, while controlling the relationship between the key and underlever, can put the damper action either too low or high to work properly. Before adopting the half stroke method for locating your damper action, be sure that that the damper system works in all aspects.