

Grandwork™ Keystep Protocol

Action-Memorized Bedding and Strike

- 1 **P** Remove return spring and bed keyframe (see the **Grandwork™ Bedding Protocol**).
- 2 **P** Choose one natural key in front of each glider stud for **Keystep** bedding samples.
- 3 If key leveling, **pre-level first and last naturals with cut balance punchings** (these leveling samples will also be bedding samples (see page 2 for an example of choosing samples).
- 4 **P** If not leveling keys, add a punching to “pre-level” first and last bedding samples anyway (a temporary pre-leveling) to support a straightedge that touches no other keys (remove cut punchings once bedding is set up on bench, replacing with uncut punchings if leveling).
- 5 **P** Choose a mid-range natural for an additional **Keystep** sample (for overall frontrail setup).
- 6 **P** Choose strike height samples: naturals closest to ends of sections but not bedding samples.
- 7 **P** Remove all frontrail punchings from sample front pins and store in order on machine screws.
- 8 **P** Secure cheekblocks and turn up each bedding/leveling sample **Keystep** to just kiss its key.
- 9 **P** Turn up mid-range sample’s **Keystep** so key kisses straightedge supported by end keys.
- 10 **P** If strike sample hammers are worn, move action out from bass cheekblock first so **hammers kiss strings between wearmarks** (templates can’t reach into wearmarks). File later, after recording hammer spacing scale. If hammers are not worn, space hammers to strings.
- 11 **P** Back off each strike sample letoff button until sample hammer blocks against strings with **WNG Dip Tool** at front of key. Then, turn down button until hammer just “lets off” from string.
- 12 **B** Fix action position on bench: Use scrap wood and double-sided tape for side-to-side and front-to-back positioning (leave front open for action removal). Stabilize keyframe’s backrail and frontrail, shimming with frontrail punchings as needed (**RS Standard** and **RS Lite** set up this way) or set up with **RS Deluxe** and use bedding platforms. If mid-range Keystep sample’s key is low or high, adjust shimming of frontrail. If replicating a crowned fit, hold down guide pins and shim frontrail so mid-range sample key just kisses the straightedge supported by leveling samples.
- 13 **B** Set bedding to samples: **Use glider studs** (bedding platforms for **RS Deluxe**) to raise sample keys to just tap on their **Keysteps** when tapped, then lower them to just not tap.
- 14 **B** Set templates to strike heights using kissing samples: Set **Regulating Rack templates** to just “let off” strike sample hammers with **WNG Dip Tool** on front end of keys.
- 15 **B** Record hammer spacing from wearmarks or from in-piano spacing on template edges at strike.
- 16 **B** Record template heights: For standard bench setup, remove the action from under the **Regulating Rack** (leaving **RR** in place to avoid benchtop-generated inaccuracies) and record strike sample heights with **String Height Gauge** – **action stays in place and RR moves with RS Deluxe**.
- 17 **B** Remove **Keysteps**, return sample punchings to pins, prep parts, align, and regulate (see **Grandwork™ Regulation Protocol**) – use **Gauge Keys** to validate blow, letoff, and backchecking.
- 18 **P** Install and square return spring, place action in piano, and secure cheekblocks.
- 19 **P** Re-bed/validate balancerail using **WNG Bedding Tool**.
- 20 **P** Complete regulation, string-to-hammer fit, tuning, and voicing.

Use naturals for sampling – facilitates punching removal, **Keystep** insertion, and sample adjustment. Also, use two templates butted together in a long tenor section to improve accuracy. Here is an example of bedding, leveling, and strike sample choices:

Steinway O (Miniature)

Note	Glider Stud	Bedding/Leveling	Strike Height
-----	GS 1	-----	-----
A 1		B/L	
B 3			SH
G 23			SH
A 25		B	
-----	GS 2	-----	-----
B 27			SH
B 39		B	
-----	GS 3	-----	-----
C 40			SH
E 44		(B)	
D 54			SH
-----	GS 4	-----	-----
E 56		B	
F 57			SH
F 69			SH
G 71		B	
-----	GS 5	-----	-----
A 73			SH
B 87			SH
C 88		B/L	
-----	GS 6	-----	-----

GS indicates the location of a glider stud, **B/L** is a **Keystep** bedding/leveling sample (notes 1 and 88 are simultaneously bedding and leveling samples), **(B)** is an additional **Keystep** used to jack up a key to be a key height sample for overall frontrail accuracy on the bench, and **SH** has punchings removed to provide extra dip needed to set a **WNG Dip Tool**-weighted kissing sample of strike height.

Note: **P** = steps done in piano and **B** = steps done on bench.