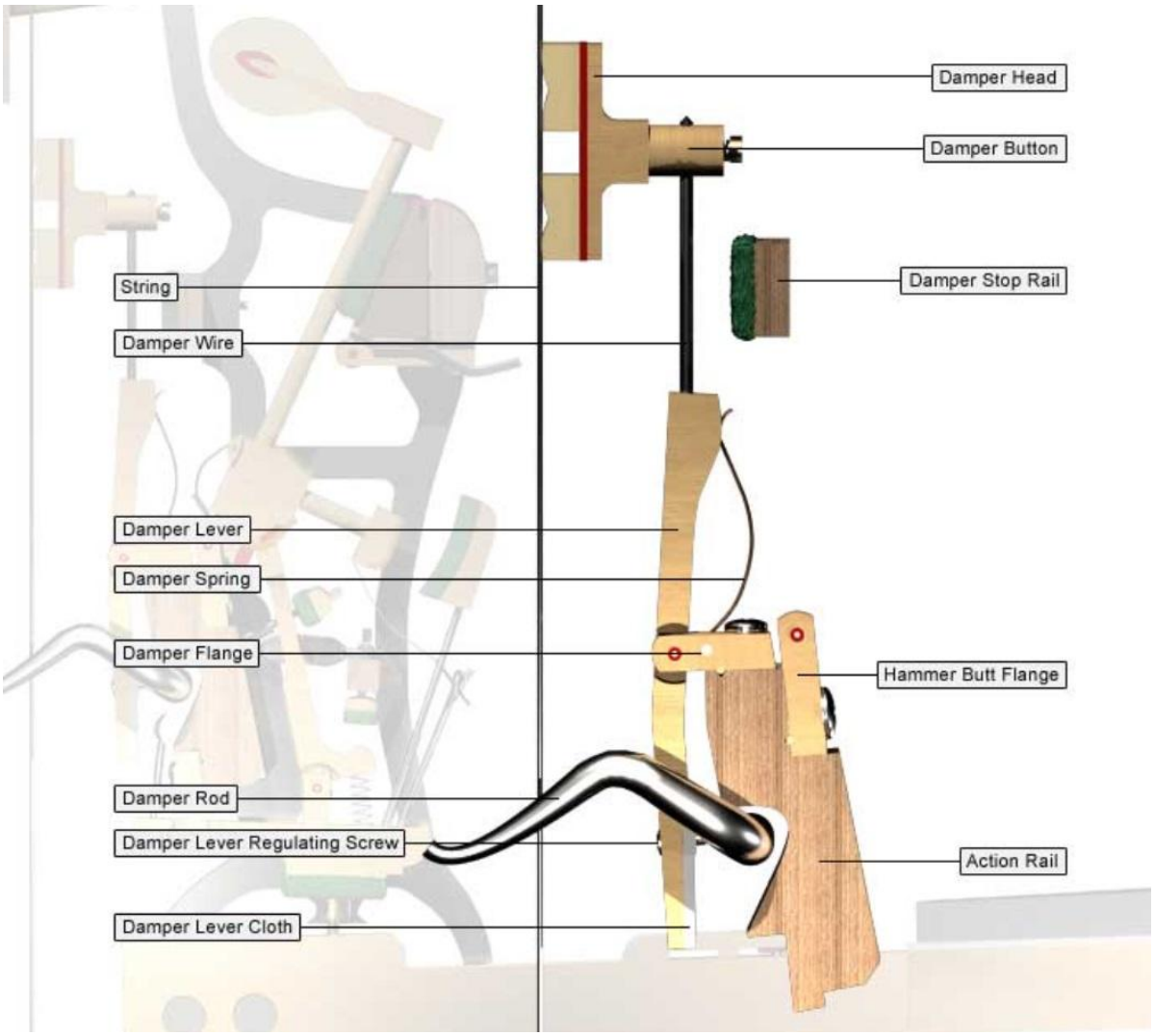
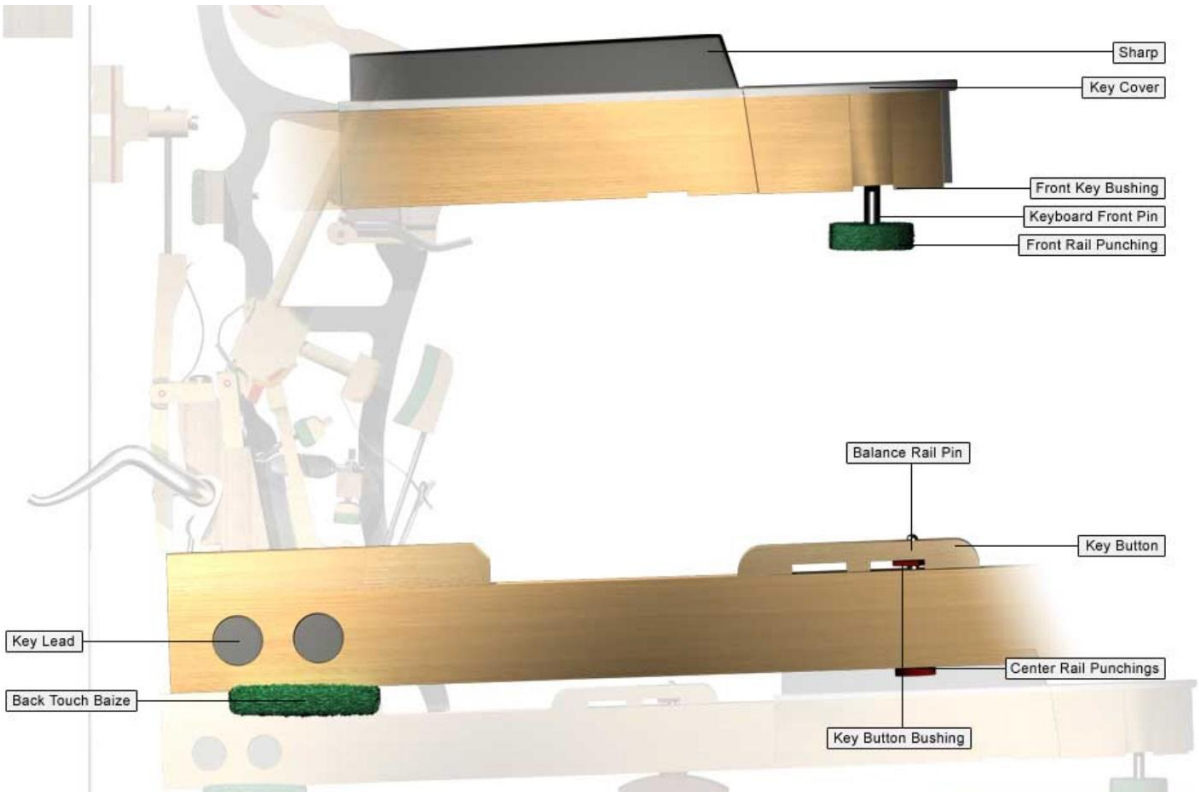
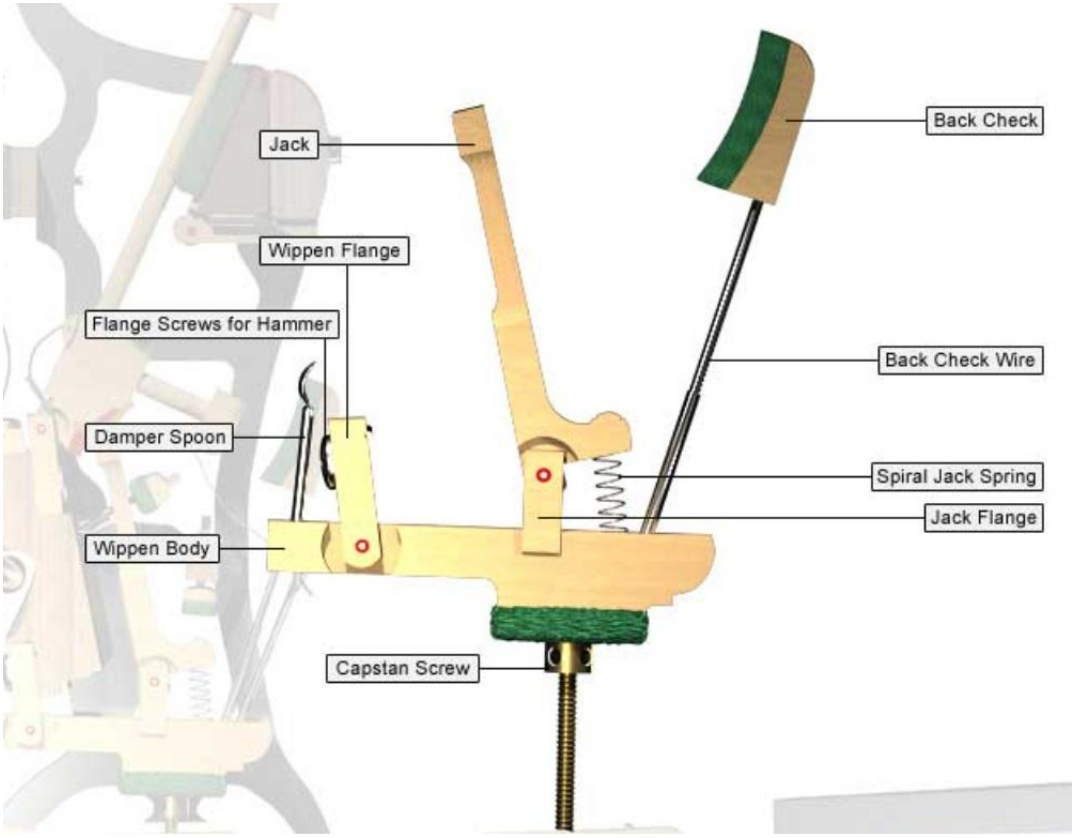
REGULATION CLASS 2
07/05/2021

-Usually, at the start of every class we will pose some questions that we may have, related or not to the topic of the day.
-It's a good idea to print the regulation manual from the previous lesson.
-In this lesson we will talk about the upright piano action:


Damper Head
Damper Button
Damper Stop Rail
String
Damper Wire
Damper Lever
Damper Spring
Damper Flange
Hammer Butt Flange
Damper Rod
Damper Lever Regulating Screw
Action Rail
Damper Lever Cloth


Sharp
Key Cover
Front Key Bushing
Keyboard Front Pin
Front Rail Punching
Balance Rail Pin
Key Button
Key Lead
Center Rail Punchings
Back Touch Baize
Key Button Bushing



-On the piano we have many pieces of wood that run the entire width from side to side, we will call these pieces a RAIL (Balance rail, front rail, hammer rest rail..)
-Underneath the key we'll find paper and felt punchings, made with a circular punch blade,the felt ones to dampen the sound and the paper ones to regulate height, this are called FRONT RAIL PUNCHINGS or BALANCE RAIL PUNCHINGS.
-If we look under the key we will see holes lined with felt, any hole lined with felt we'll call it a BUSHING.
-The KEY TOPS are a sheet of plastic or ivory glued on top of the key.
-The KEY BUTTON also contains a felt bushing.
-At the end of the key rises the CAPSTAN, they can be very different, some come with a bolt you turn to adjust its height, others are made from metal with holes drilled in them, some of the old ones are like four braces with a cap on top, and are turned with a tool to adjust them, another type is rounded at the bottom and has two screws on the side to adjust it, so we loosen one screw to tighten the other and regulate its height that way.
-Next we find the WHIPPEN, attached to the main rail, with its main parts: WHIPPEN BODY, FLANGES and BACKCHECK.
-The flanges are sort of a cradle that is joined with center pins, wich attach by friction to the center piece and rotate freely between felt bushings on both sides, the pin rotates with the centerpiece, they can also be reversed, where the rotating part is outside and the felt bushing is in between.
-The JACK transfers the movement from the whippen to the HAMMER BUTT, that has the CATCHER pointing towards the BACKCHECK.
-Then the SHANK goes up to the HAMMER HEAD, resting on the HAMMER RAIL.
-The DAMPERS sit on the string, pressing and muting it, but they come off when we press the key, thanks to the spoon pressing the bottom of the damper, behind we find the DAMPER BLOCK RAIL, with felt to silently stop the backwards motion of the dampers.

-The appeal of the piano comes from its capacity to play softly. Hence the name Pianoforte. Historically the strings were plucked without any variations in volume, to be able to play softly you need an escapement mechanism, so that when we press the key and everything starts moving at the same time, the hammer is launched forward and the jack slips on the hammer butt and disengages it, leaving it moving free.
The jack has a foot or “toe”, that engages with the letoff button and provoques this motion.
-With a single down press of the key the hammer moves forward, then backwards, and then forwards a little bit, this is because the jack moves the hammer and escapes the hammer butt, then the hammer comes back to be stopped by the catcher hitting the backcheck, and finally the backcheck pushes the hammer forward a little bit.
-The closest distance that a hammer gets to a string it’s called LETOFF, and it’s roughly 1/8in. on uprights and 1/16in. On grands, we will get deeper into this later on, but if to make everything work we have to change this distance, it’s OK.
-When the hammer is at rest, the distance to the string is called BLOW DISTANCE.
-And the distance that the key goes down until it tops with the front rail punching is called KEY DIP.
-This 3 terms form the vertices of the REGULATION TRIANGLE, and work together to produce AFTERTOUCH, which is the distance that the key travels after letoff.

-When we play the key, the dampers come off the string before the hammer hits, this is caused by the SPOON, which moves along the whippen and pushes on the bottom of the damper lever, causing it to come off the string.
-The accepted regulation for DAMPER LIFT is from ½ to ⅓ the distance from the traveling hammer to the string, it’s even better if is ½ or a bit less, because the pianist will feel it, the spoon lifting the damper, and it will give them more control over the dynamics.

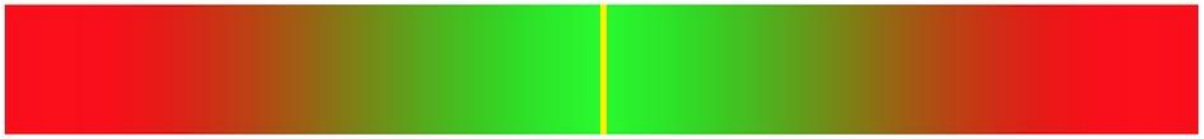
-We also find various SPRINGS, like the jack spring, damper spring or the hammer spring, which sometimes is hooked to the damper rest rail (also called spring rail) and others to the hammer itself, while on the other end it hooks to a loop of thread tied to the hammer butt.

-Sometimes, depending on the size of the piano, the wire of the capstans may be too long, making it wobbly and sometimes miss the whippen entirely, so they add a rail between the capstan and the whippen, with pieces called STICKERS, which join the two pieces with wood on wood joints. When the piano is really short we’ll find very short capstans or even a drop action, in which the keys are angled down or the whippen joined to the key by a wire called the LIFTER WIRE.
-When we take out a piano action, after loosening the knobs and tilting it back to protect the dampers, we would have to secure every lifter wire to the action to avoid them being tangled. It’s a really hard process to work with these pianos.

-The BRIDAL STRAPS purpose is to keep the jacks from going under the hammer butt when we remove the action, also in some pianos adds an extra level of pullback on the hammers, in addition to the hammer spring’s action.
-This is usual when placing the action back into the piano, the jacks stuck under the hammer butts and the hammers hit the string, maybe even preventing the installation of the action. When this happens we must slip all jacks back manually to allow clearance.
-When installing a bridal strap, insert the leather part into the loop BEFORE nailing the hole on the pin, so the leather does not crumble.

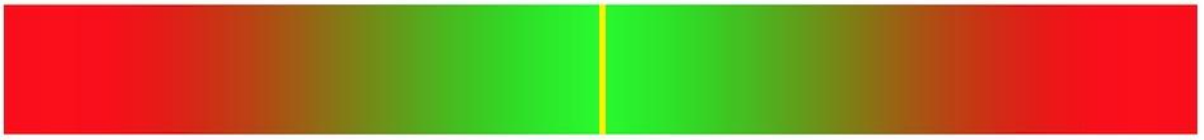
-When facing any task at piano technology, we find that there is a spectrum between total malfunction and flawless state, let's put some examples:

Example 1: Length of the loop of the hammer spring:



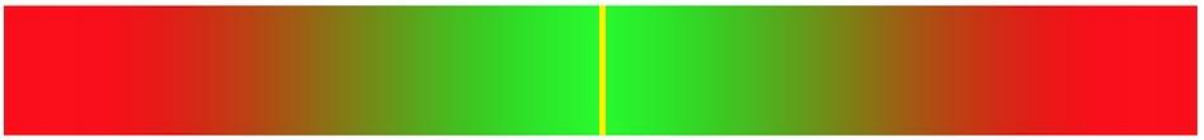
I-------TOO SHORT--------I I-----------------------------FUNCTIONS PROPERLY-----------------------------I I--------TOO LONG--------I

-Yellow represents the highest craftsmanship or even perfection, where all the loops of the hammer springs are the same length, color, material, positioning… etc.
-Some techs will aim for the working zone, as this is enough for 99% of the home pianos, and a good equilibrium between cost and result, while others aim for the perfect spot, the great craftsmanship, with both perfect function, proportion and looks, like in the ambient of concert or studio pianos, or at factories where a process is repeated for years and years.
-Is up to us to decide what type of technician are we going to be, if we are going to work at residential homes,churches, choirs, concert halls, recording studios, piano workshops or factories, we should decide what level of craft to aim for in every situation, and usually the client and budget will decide for us.
-Some more examples:
Example 2: Regulation



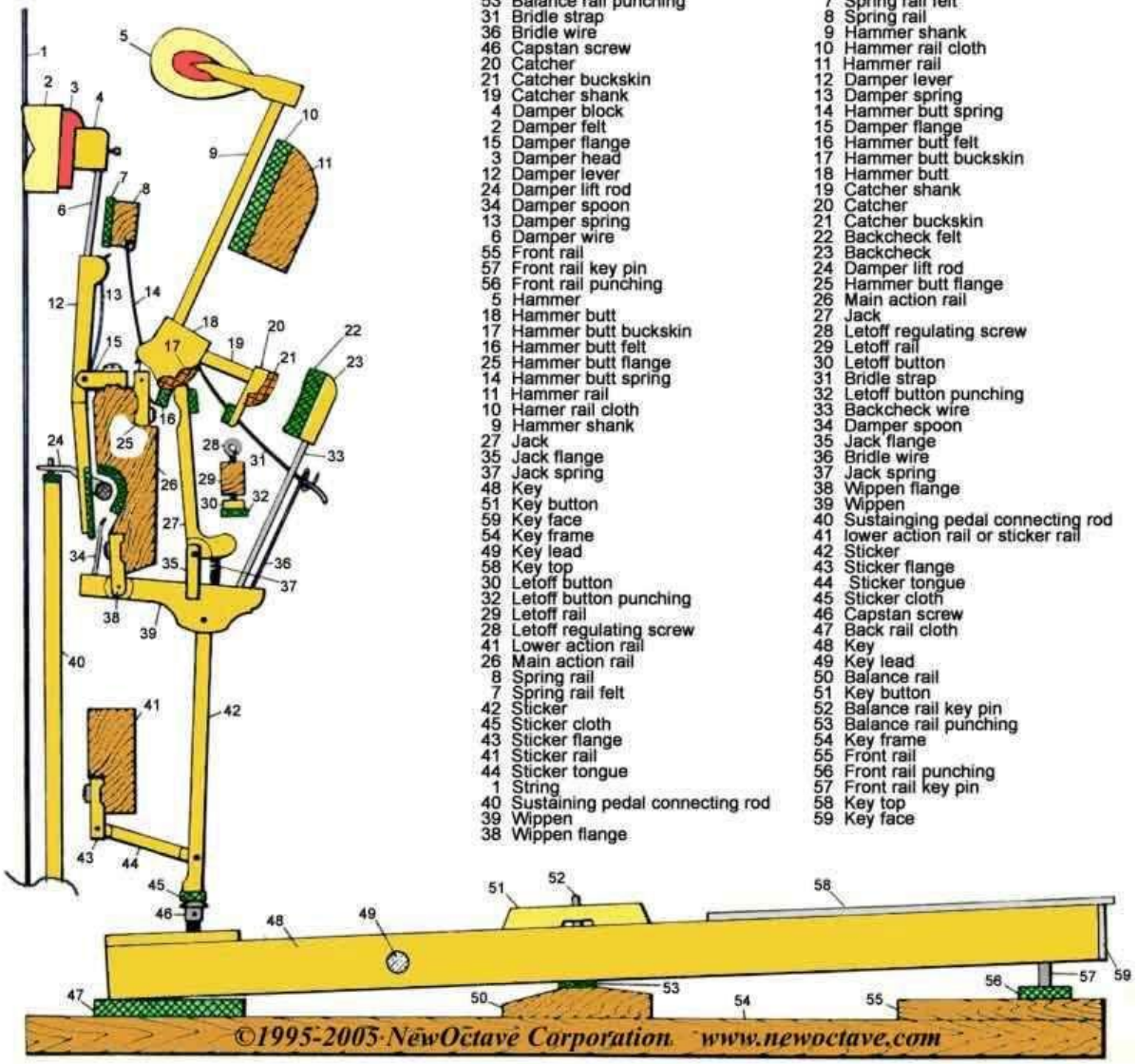
I-----DON'T WORK-----II--------DOESN'T WORK WELL BUT 99% OF PIANIST WON'T NOTICE---------II-----DON'T WORK-----I
I
I
1% WANTS THE PIANO HERE
AND NOTICES ANY DRIFT

Example 3: Replacing strings



I--NOT ENOUGH COILS--II-----------------------------3 COILS ON EACH PIN-----------------------------II----TOO MANY COILS---I
I
I
3 COILS AND SAME ANGLE
OF ALL BECKETS

Is up to us to decide what type of service we're going to provide, and to get the proficiency and skill to get the task completed to the desired level of craftsmanship, repetition legitimizes and good technique will always lead to faster and higher quality services.



Alphabetically:

47 Back rail cloth
23 Backcheck
22 Backcheck felt
33 Backcheck wire
50 Balance Rail
52 Balance rail key pin
53 Balance rail punching
31 Bridle strap
36 Bridle wire
46 Capstan screw
20 Catcher
21 Catcher buckskin
19 Catcher shank
4 Damper block
2 Damper felt
15 Damper flange
3 Damper head
12 Damper lever
24 Damper lift rod
34 Damper spoon
13 Damper spring
6 Damper wire
55 Front rail
57 Front rail key pin
56 Front rail punching
5 Hammer
18 Hammer butt
17 Hammer butt buckskin
16 Hammer butt felt
25 Hammer butt flange
14 Hammer butt spring
11 Hammer rail
10 Hamer rail cloth
9 Hammer shank
27 Jack
35 Jack flange
37 Jack spring
48 Key
51 Key button
59 Key face
54 Key frame
49 Key lead
58 Key top
30 Letoff button
32 Letoff button punching
29 Letoff rail
28 Letoff regulating screw
41 Lower action rail
26 Main action rail
8 Spring rail
7 Spring rail felt
42 Sticker
45 Sticker cloth
43 Sticker flange
41 Sticker rail
44 Sticker tongue
1 String
40 Sustaining pedal connecting rod
39 Wippen
38 Wippen flange

Numerically:

1 String
2 Damper felt
3 Damper head
4 Damper block
5 Hammer
6 Damper wire
7 Spring rail felt
8 Spring rail
9 Hammer shank
10 Hammer rail cloth
11 Hammer rail
12 Damper lever
13 Damper spring
14 Hammer butt spring
15 Damper flange
16 Hammer butt felt
17 Hammer butt buckskin
18 Hammer butt
19 Catcher shank
20 Catcher
21 Catcher buckskin
22 Backcheck felt
23 Backcheck
24 Damper lift rod
25 Hammer butt flange
26 Main action rail
27 Jack
28 Letoff regulating screw
29 Letoff rail
30 Letoff button
31 Bridle strap
32 Letoff button punching
33 Backcheck wire
34 Damper spoon
35 Jack flange
36 Bridle wire
37 Jack spring
38 Wippen flange
39 Wippen
40 Sustainging pedal connecting rod
41 lower action rail or sticker rail
42 Sticker
43 Sticker flange
44 Sticker tongue
45 Sticker cloth
46 Capstan screw
47 Back rail cloth
48 Key
49 Key lead
50 Balance rail
51 Key button
52 Balance rail key pin
53 Balance rail punching
54 Key frame
55 Front rail
56 Front rail punching
57 Front rail key pin
58 Key top
59 Key face