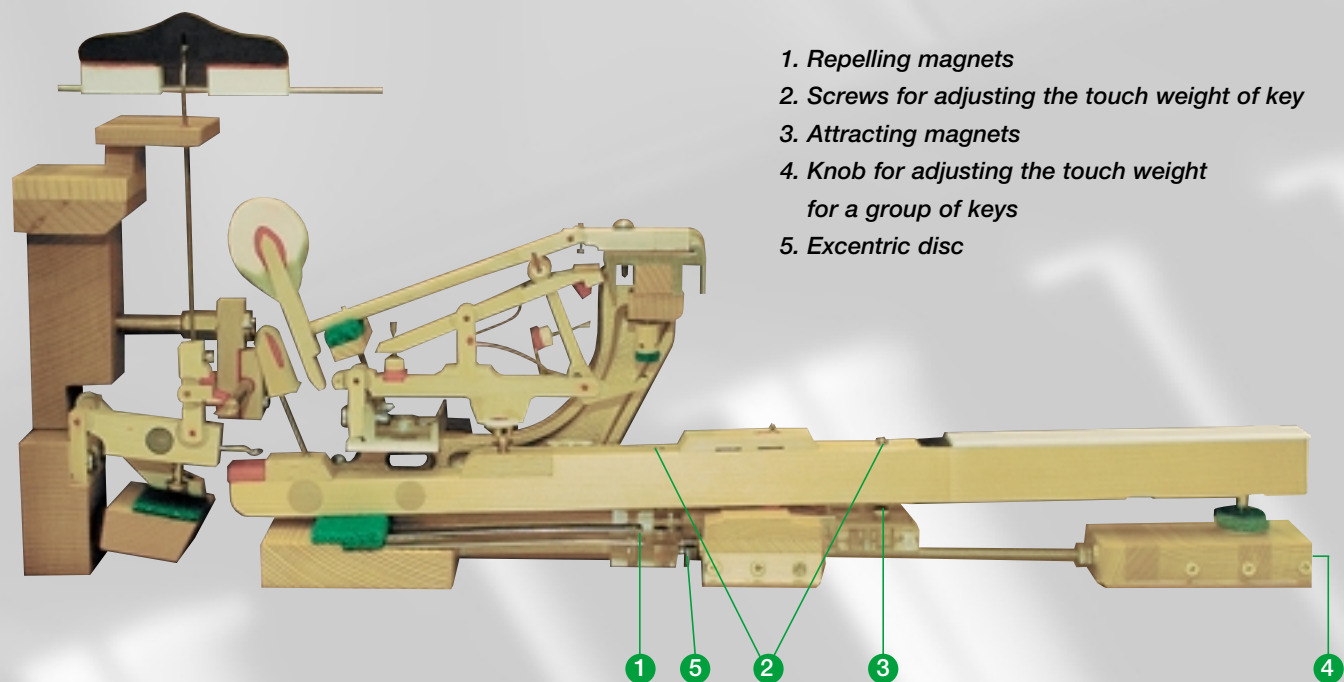


1. Repelling magnets
2. Screws for adjusting the touch weight of key
3. Attracting magnets
4. Knob for adjusting the touch weight for a group of keys
5. Eccentric disc



MAGNETIC BALANCED ACTION

What do you gain with MBA?

- **Magnetic field instead of balancing lead weights improves dynamic qualities**
- **Fast and easy adjustment of the touch weight**
- **Positive effect on the key return speed**
- **Better control in pianissimo playing due to optimal touch key force development during keystroke**
- **Easier and more accurate adjustment of the touch weight of individual keys**

At the start of the new millennium, we would like to introduce a new grand piano action:

The **Magnetic Balanced Action**, or **MBA** for short.

It is very easy to adapt the piano's touch weight to the personal wishes of the piano player (touch weight is the force that works at the key end and causes defined pressing of the key).

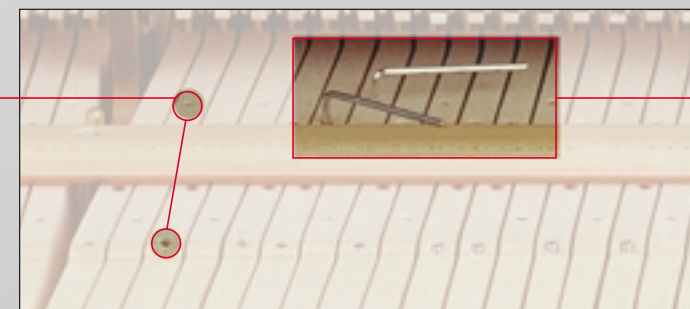
The conventional grand action

During the development of the piano in the 19th and the 20th centuries, the weight of the hammers was increased in order to increase the sound volume of the instrument. To maintain the proper touch weight of the keys, the practice of inserting lead weights became common. This improves the static evenness of the action system. When lead weights are added, the weight of the leverage system, which is put into motion by the pianist, is increased. This can be described as dynamic resistance of the system. The result is the instrument playability is more difficult. The touch weight is adjusted during the manufacture of the instrument, and it is impossible to adapt the touch weight to the wishes of an individual pianist in a practical way.

The new Magnetic Balanced Action (MBA) system and its advantages

The new **MBA**, invented by Evert Snel and Hans Velo from the Netherlands, uses a system with magnets. In short: a pair of attracting magnets are active at the front end of the key and a pair of repelling magnets are active at the rear end of the key. The important advantage of this system is that there is a very small increase in dynamic resistance, as compared with the traditional method of using lead weights for balance. Above all, it is very easy to change the touch weight in a short time and even to make different adjustments in the treble, middle and bass sections.

Screws for position adjusting of front and rear magnets for individual keys

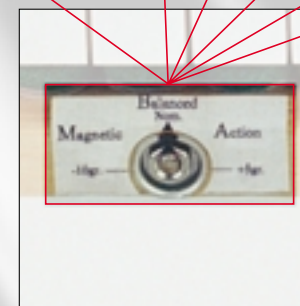


Tools for position adjusting of front and rear magnets for individual keys

1 2 3
Keyboard splitting to three independently adjustable sections



Adjustment knobs with touch weight scale



Adjustment method of touch weight (lifting of rails with lower rear magnets)



In fact, the player can do it himself by means of adjusting a few points at the front of the instrument. The touch weight can be changed from +5 grams to -10 grams from the nominal value (usually around 50 grams). That means approximately from +10% to -20% of the usual touch weight.

It is beneficial for the pianists with different physical abilities (e.g. children and adult) to be able to adjust the touch weight to their personal wishes. Another very important advantage is that less physical effort is required to play the piano. This reduces the risk of related health problems (e.g. tendons fatigue etc.).

Next advantage of **MBA** is that the key has a lower starting touch key force than normal and a higher touch key force than normal when the key is fully depressed. The result of this is better control in pianissimo playing with a positive effect on the speed with which the key returns to its rest position.

The last but not the least advantage is quick and easy touch weight adjustment of individual keys during the piano manufacture. It is also simple to make these adjustments later on if, for example, the hammers should ever need to be replaced. It helps to equalize the touch weight of the piano keys.

The working of the Magnetic Balanced Action (MBA)

At the front end of the key a magnet attached to an adjusting screw is placed. Underneath this magnet there is a second magnet mounted on a fixed rail. The polarization of these two magnets

is such that they attract themselves. The amount of attraction can be adjusted by changing of the air gap between these two magnets by means of the adjusting screw. When the key is pressed, the gap between these magnets becomes smaller and the amount of attraction increases. A second pair of magnets is applied to compensate this effect. One magnet is mounted at the rear end of the key in the same way as the magnet which is mounted at the front end of the key. Another magnet, opposite to this one, is fixed on a vertical movable rail. These two magnets repel themselves. When the key is in its rest position, the gap between the repelling magnets is relatively narrow and the gap between the attracting magnets is relatively wide. When the key is depressed, the attracting force at the front end of the key increases and the repelling force at the rear end of the key decreases. The amount of repelling force can be adjusted by changing of the air gap between these two magnets in the same way as mentioned above for the front magnets. Treble, middle and bass sets of the rear bottom magnets are fixed on separate vertically movable rails. The repelling force of the magnets can be changed throughout entire sections at the same time simply from the front of the piano. This allows to change the touch weight for the treble, middle and bass sections of keys separately. The piano player himself can adjust the touch weight of the piano almost immediately. The modern magnet material used in **MBA** will not lose its magnetic properties during the whole lifetime of the piano.

Magnetic **Balanced** *Action*

PETROF, spol. s.r.o. presents a revolutionary technical innovation – a piano mechanics system called MBA. It is indispensable for pianists of all age groups as well as various skill levels. It is handled easily and makes piano playing perfect. And that is why high quality playing can only be achieved with the new MBA mechanics!

Magnetic Balanced Action can be installed into all manufactured PETROF grand piano models on a special request.



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Magnetic Balanced Action

