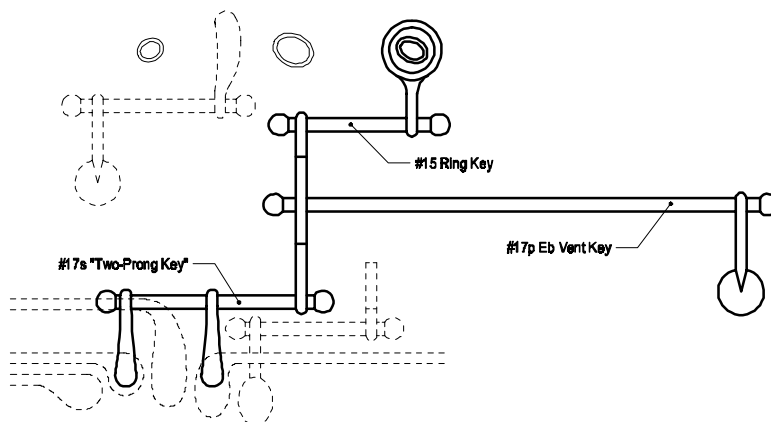


C#/D# Trill Key

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The C#/D# Trill Key was developed by Wilhelm Heckel in 1880. In its earliest form it functioned only for trilling between C# and D#. Heckel soon realized that this key could also benefit the high B and C if it were to open while playing those notes. To accomplish this the original linkage to the C# key was extended to the high C key.

Parts of the mechanism

There are three parts to the C#/D# trill key mechanism.

The #17p Eb vent key carries the pad that closes the Eb vent hole. This small angle drilled hole will play an Eb in combination with the C# tone hole or it aids in the sounding of the high B and C in combination with the high C vent.

The system is actuated by the #17s two prong key. This key functions as a touch even though it never experiences direct contact from the player. In its static position it holds the #17p Eb vent key closed. The Eb vent hole can only open when either the C# key or the high C key is depressed.

The #15 ring key functions to keep the C#/D# trill key deactivated. It also makes the change between the C# and the D# in the trill. The #15 ring key is often replaced with a plateau key that is commonly used for student instruments for persons with small hands.

Functions

The C#/D# trill is played by depressing the C# key with the left thumb and trilling the ring key with the left third finger. While the ring key is held depressed the normal fingering for C# is in use. When the ring key is released allowing the Eb vent hole to open the resulting tone is a passable D#.

This mechanism also functions when the high C key is depressed. For this purpose the Eb vent hole has only a small effect on the pitch of the note but has a great effect on the tone, resonance and response of the high B and C.

For all other notes played with either the C# key or the high C key depressed the ring key will also be closed, keeping the Eb vent hole closed.

Misuse of the C#/D# trill key

There are two common ways in which this key is misused. In one it is used as an incorrect fingering and in the other it is partially disassembled.

There has been a fingering chart at some time in the past included in a band method that includes a very wrong fingering. In this chart the fingering for Eb utilizes the C#/D# trill key. For playing an Eb this fingering is terrible. It passes for usable as a note in a trill but as a sustained note it does not work. This fingering was probably included because the normal (and correct) fingering is a forked fingering which is considered difficult to use.

Some bassoonists have an incorrect opinion about plateau keys. They feel that it is a "student" key and not a "proper" key. The reality is that it is a perfectly good key that exists as an accommodation for small hands. These bassoonists will simply remove the key from their students instruments and have the student play the instrument without the plateau key. Without the key, when the student attempts to play a C# the Eb vent also opens resulting in a note somewhere between a C# and a D. If the teacher secures the Eb vent closed with a wedge not only is the trill unusable but the Eb vent also cannot open for the high B and C. The presence of either the plateau key or a ring key is absolutely essential.

Spring Adjustments

The C#/D# trill key is an automatic mechanism and as such tends to be dependent on careful attention to spring strengths.

The primary spring for the system is the heavy spring for the two-prong key. This spring functions to hold the E \flat vent pad closed. It must be strong enough to overwhelm the moderate spring that opens the E \flat Vent key. However, if it is too strong it may be difficult to equalize the feel of the thumb touches.

The E \flat vent is sprung strong enough to open itself and must also lift the ring key. Too strong a spring on the E \flat vent imposes excessive demands on the two-prong key and can cause problems.

The spring for the ring key can be very light. It is needed only to keep the ring down while at rest. When a plateau key is used the direction of the spring is reversed. The plateau key must be held open. This may require a slightly stronger spring that would be needed for a ring key.

To adjust the spring strengths begin with only the ring key and the E \flat vent key in place. Be certain that the E \flat vent key opens without question but without excess resistance at the ring key. Next remove the ring key and add the two-prong key. Now the E \flat vent must be held closed without question but again do not use more spring strength than necessary.

Padding & adjustment

Begin by padding the E \flat vent key. Leave everything else out of the way. The two-prong key, the ring key and the C# lever should all be off the joint during this.

Next add the ring key. The ring should close the E \flat vent pad and be comfortably close to level with the raised finger hole. If a plateau key is present it will need to be padded at this time. The plateau key should open about 3/32" and must close the E \flat vent when depressed.

The two-prong key can be the most complicated part to adjust as it functionally becomes part of the lever keys above it. The objective is to get the tops of the thumb touches lined up and for them all to depress about the same distance.

The use of a gauge simplifies the process. Make the gauge of rod of about 2mm diameter bent so that about 1/2" is at a right angle to the rest of the rod. This gauge will test for the available space under the keys.

Begin by padding the lever keys. Leave the two-prong key off for now. Adjust the levels of the tops of these keys so that they coordinate with the bass keys. Ideally the high A will be the correct distance above its stop post as tested by the gauge.

Install the two-prong key, the high C and the C# key. Leave off the E \flat vent key and the high A key.

The two-prong key should be without any cork under the two prongs. Adjust the two prongs so that they are equally in contact with the buttons on the underside of the C# and high C touches. It is also desirable if the buttons and the prongs are roughly square with each other.

Now determine the correct cork thickness. Estimate the thickness of cork you will need and place it under the upper (high C) prong. Hold it in place with one of the two levers and use the gauge to check the gap between the button of the other lever and its prong. When you know the thickness that is correct or that can be sanded to the correct thickness glue it to the upper prong. There is no need for cork under the lower (C#) prong.

Now install the E \flat vent key. The lower connecting arm of the two-prong will need to be adjusted until, with the E \flat vent pad closed, there is a 1/64" gap under the buttons of the C# and high C keys.

The gap between the high C and C# buttons and their prongs is necessary for a technique called "flicking." In this technique the thumb touches must be briefly depressed so that their vents open slightly without the E \flat vent pad opening. This gap allows this to happen. It is arguable that there is no need for the gap under the C# key and some players will prefer not to have it. In general it is acceptable to have a gap under both keys.

Once the two-prong key is fully adjusted with the thumb touches and the E \flat vent pad the ring key can be replaced. At this point make sure that the foot of the ring key does not keep the E \flat vent pad from fully opening.

With a plateau key an ideal adjustment can get a bit more difficult. Because the foot of the plateau key is always in use when the plateau is open there can be a gap between the opened E \flat vent key and the open plateau key. This can cause an uncomfortable double action. The solution usually involves readjusting the E \flat vent key to the plateau key and the readjusting the two-prong key to the E \flat vent key. On some instruments an ideal adjustment can be difficult to obtain.

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