

## Emergency Flute repairs (Jun 2019)

This document is aimed at players or teachers who feel competent using a precision screwdriver on a flute, and it is intended to help when a flute suddenly develops a problem in a lesson or performance; these checks (and possible remedies) do not involve removing any keys.

Whatever the problem – always check the flute in the same order - working from the head-joint to the foot-joint - regardless of where the problem appears to be; this may not always be the quickest way of solving a problem but it is the most reliable way.

1. Check the head-joint – is the crown at the top of the head-joint loose? Or is the head-cork assembly loose? (Check by inserting the tuning rod into the head-joint) If the crown is loose tighten it (but check that tightening the crown is not moving the head-cork assembly away from its correct position), if the head-cork assembly is loose push it back up the head-joint with the tuning rod, ideally the tuning mark on the rod should appear in the middle of the embouchure hole – but it is more important that the head-cork assembly is not loose.
2. Check that the screw heads at the ends of the key barrels are not loose – there are 6 that are accessible: the trill keys' upper pillar screw, the high C key rod screw, the thumb keys' rod screw, the G assembly rod screw, the trill keys' lower pillar screw, the right-hand keys' end pillar screw, and the foot-joint keys' rod screw (the rod screw for the G# key is inaccessible unless the instrument is stripped down). If a screw head is loose then tighten it - if any key jams when the screw head is fully tightened then loosen the screw head slowly until that key operates again. Also check the roller on the Low C key – sometimes this works loose and then it can prevent the foot-joint keys operating properly – it is sometimes possible to access this rod screw that the roller rides on by holding down the touch-piece for the D# key.
3. Check that all the 'needle' springs are present and hooked on to their respective keys – again work from the top of the instrument. There should be a spring for each key cup (unless there is no split E mechanism in which case there will be only 1 spring for the two G key cups); the springs for the two top trill keys will either both be at the top pillar, or one at the top trill pillar and one at the bottom trill pillar; the thumb key cup will usually have a 'flat' spring but the thumb lever may not. If a needle spring has become unhooked from the key it operates, then hook it back into place – there is usually a stub sticking out from the underneath of the key barrel – if the spring is missing, or has come loose from its pillar there is nothing you can do about it (unless it is an unused trill key – in which case jam a bit of folder paper or card under the relevant trill touch-piece to jam the key shut). Sometimes a thumb key flat spring slides out of place and prevents the thumb keys working properly – if this has happened push the spring back under the key.
4. Check that all the keys move freely – again working from the top of the instrument check that each key cup opens and shuts properly – if any key does not operate (and assuming that the spring for that key is present and hooked on) see if loosening the relevant screw or rod screw that the key rides on frees up the key.
  - depress the upper trill key touch-piece to check it opens and closes by itself
  - depress the lower trill key touch-piece to check it opens and closes by itself
  - depress the high C key to check it closes and then opens by itself
  - depress the Bb key cup via its trill touch-piece adjacent to the F key to check it closes then opens by itself (if it does not close fully this is sometimes because the trill touch-piece has been bent down and is hitting the F# key – in which case gently bend the trill touch-piece up again)
  - hold the Bb key cup shut with one finger and depress the A key cup to check it closes then opens by itself
  - hold the A key shut with one finger and depress the thumb key cup to check it closes then opens by itself
  - hold the A key shut and depress the thumb key and thumb lever together to check they close and then open by themselves

- depress the upper G to check that the G keys (as a pair) close and then open by themselves (if they do not it is sometimes because the G# touch-piece has been bent and is jamming one of the G key cups – in which case try gently bending the G# touch-piece away from the key it is jamming)
  - depress the G# touch-piece to check the G# key opens then closes by itself (if it does not it is sometimes because the G# touch-piece has been bent out of alignment and this has bent the key rod – in which case try gently bending the G# touch-piece back to its correct alignment so that the G# key arm is equidistant between the two G key cups)
  - depress the F# key cup and check it closes and then opens by itself (this key is not directly operated by the player – it is adjacent to the F key and usually closed by operating the F, E, or D keys)
  - hold the G keys and the F# key shut and check that the F, E, and D keys all individually close then open by themselves
  - depress the D# key touch-piece to check that it opens then closes by itself
  - depress the Low C# touch-piece to check the key closes and then opens by itself
  - hold shut the Low C# key and depress that the Low C key roller to check the Low C key closes then opens by itself
5. Check the regulation of the instrument – on most flutes there are small 'adjusting screws' for certain keys – these are either adjacent to the keys near the key barrel, or at the back of the key cup. Working from the top of the instrument check the following:
- hold the high C key shut, then close the thumb lever – the note 'Bb' should sound - if it doesn't there is little you can do because there is no adjusting screw to regulate this correspondence
  - hold the high C key and the thumb key (but not the thumb lever) shut, then close the A key – the note 'A' should sound – if it does not then look to see if the Bb key cup is closing when you press the A key – if it does not close then tighten the A key adjusting screw until it does (on the other hand if the Bb key cup is closing before the A key, loosen the adjusting screw)
  - hold the high C key, thumb key, and A key shut, then close the G key(s) – the note G should sound – if it does not (and the flute has a split E mechanism) look to see if the lower G key cup is closing when you press the upper G key cup - if it does not close then tighten the G key adjusting screw until it does (on the other hand if the lower G key cup is closing before the Upper G key cup, loosen the adjusting screw)
  - hold the high C key, thumb key, A key, and the G key(s) shut, then close the F key – the note F should sound – if it does not then look to see if the F# key cup is closing when you press the F key – if the F key is closing but the F# key cup is not, tighten the F key adjusting screw (on the other hand if the F# key cup is closing before the F key, loosen the adjusting screw) – if both key cups are not closing properly then it could be that the long Bb regulation is out – see if the Bb key cup is closing before the F key, unless there is an adjusting screw at the correspondence between the F key and the Bb key there is nothing you can do about it
  - hold the high C key, thumb key, A key, G key(s), and the F key shut, then close the E key – the note E should sound – if it does not then look to see if the F# key cup is closing when you press the E key – if the F# key cup is closing before the E key then loosen the E key adjusting screw (you will need to check you can also play the note F# using the E key – if you cannot - then the E key is closing before the F# key and so you will have to tighten the E key adjusting screw). If both the F# and E key cups are not closing properly (and there is a split E mechanism fitted) look to see if the lower G key cup is closing before the E key cup - if this is what is happening there is nothing you can do about it
  - hold the high C key, thumb key, A key, G key(s), F key, and E key shut, then close the D key – the note D should sound – if it does not then look to see if the F# key cup is closing when you press the D key – if the F# key cup is closing before the D key then loosen the D key adjusting screw (you will need to check you can also play the note F# using the D key – if you cannot - then the D key is closing before the F# key cup and so you will have to tighten the D key adjusting screw).
  - hold all left hand and right hand keys shut, and then close the Low C by pressing the C roller only – the note C should sound - if it does not sound then look to see if the Low C and C# keys are closing together – if they are not there is nothing you can do about it

Whether you manage to solve the immediate problem or not, I recommend the instrument is taken to a repairer as soon as possible for a more lasting repair (unless the cause was simply a spring becoming un-hooked).

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