

## Oddstruckness in bells.

In order for a bell to be even struck, three things need to be achieved;

- The bell hangs level on its headstock
- The clapper swings freely with little sidewise play aligned correctly to swing at 90 degrees to the line between the bell bearings.
- The clapper hangs exactly in the middle of the bell

### Bell hanging level

Take the weight of the rope off the bell so that it does not skew the bell.

Now use a spirit level across the lip of the bell and check it is level.



If it is not level the adjustment depends on:

- the way the bell is attached to the headstock
- whether the headstock is metal or wood
- whether the bell has canons that are still being used to hold the bell onto its headstock.

When making any adjustments to the hanging of the bell loosen the clapper assembly and twiddle pins (see note 3) first and tighten them up afterwards.

It may be easier to attach a small weight on the wheel to level the bell depending on the size of the problem.

## **Clapper swings freely with little sidewise play and is aligned correctly**

Nearly all bells now have an independent clapper assembly which is bolted through the headstock and has a retaining nut on the top of the headstock. In some old bell installations which are well over 100 years old the clapper may still hang from a staple cast into the bell. If this is the case there is not much that can be done easily.

Where the clapper staple assembly is independent ensure the clapper staple is tight in the headstock of the bell and the horizontal clapper pin is tight on the staple. It is important that there is a locking device (lock nut or split pin) fitted to both the clapper pivot pin and staple nut to ensure the nuts stay tight.

Ensure the clapper pivot point is lubricated with grease and that the clapper swings easily.

Check the clapper swings exactly in line with the movement of the bell, ie at 90 degrees to a line between the bell bearings.

If the clapper is swinging out of line the uneven amount of side friction in the staple assembly will make enough difference to the swing time of the clapper to make the bell oddstruck.

On an average size bell the clapper only takes 1/3 of a second to travel from one side to the other so any small variation is noticeable. Also the clapper bearing will wear more if the alignment is not correct.

If the clapper is loose, not correctly aligned or stiff then these need to be corrected.

If the headstock has twiddle pins to adjust the clapper position one of these needs to be loosened in order to adjust the clapper assembly.

Adjusting the clapper is a two person job, one to tighten the clapper staple nut, one to hold the clapper in the correct alignment.

Always check that there is a leather pad between the clapper staple and the bell, if not add one or the clapper will not stay tight with a metal to metal contact between the bell and staple assembly.

## **Clapper in the middle of the bell**

With the weight of the rope lifted from the wheel, the bell stationary and the clapper at rest measure the distance from the ball of the clapper to the lip of the bell on each side.

Bells on ball bearings move very easily and clappers also need to move easily to work properly.

The difference between the measurements needs to be less than 3mm (1/8") for the bell to be even struck.

It is best to do this with two people and two tape measures at the same time to ensure the bell and clapper are in the same place. Take the measurement several times to confirm.

If the differences between the measurements are greater than 3mm then the clapper position needs adjusting.

Loosen both twiddle pins (if there are any) and the clapper bolt and adjust twiddle pins or use a small wedge (a leather belt or similar thickness pad is suitable) to move the position of the staple pivot point to be central in the bell. If you are using a wedge this needs to be placed between the

inside of the bell and the top of the clapper staple in order to tilt the clapper Assy so that at it's pivot point it is central in the bell.

Re-tighten and check again always ensuring that the clapper is correctly aligned before you re-tighten the clapper assembly. This can take some time !!!

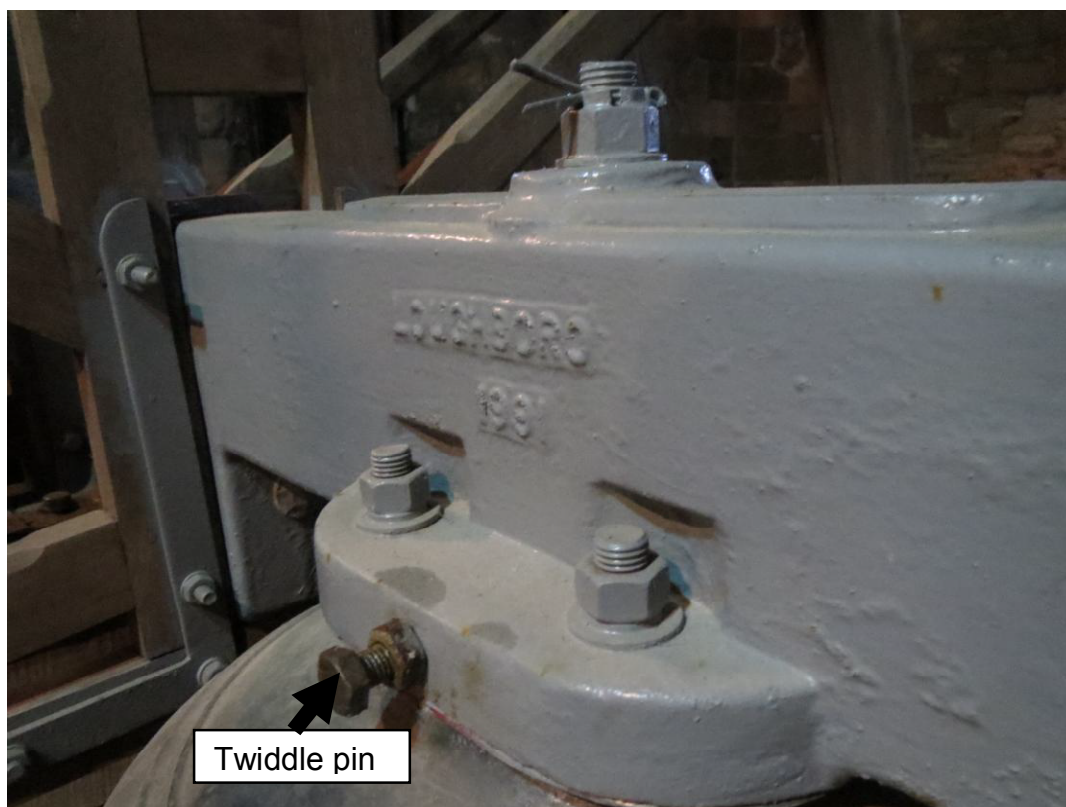


### Notes

1) When the clapper still hangs from a cast in crown staple the options on adjusting away oddstruckness are considerably reduced.

2) The sidewise play on the clapper should be no greater than 25mm (1") and the vertical play no more than 3mm (1/8"). If either of the movements on an independent clapper assembly is greater than this the clapper may need rebushing.

3) Twiddle pins are bolts screwed into either side of metal headstocks to help centre the clapper assembly. They started to be fitted about 20-30 years ago by the bell hangers and are now fitted on all new metal headstocks as standard.



4) I find it takes on average about ½ hour per bell with two people to sort out a bell's oddstruckness.

5) On bells up to around 12 cwt it is possible to check whether a bell is oddstruck by getting the bell half way up on the wheel, with the rope removed and let it lower itself.

If it consistently misses on one side as it lowers the clapper is not in the middle of the bell.

The ideal situation is that it strikes on both sides nearly all the way to the bottom and then when it does start to miss on one side it switches and misses on the other side every few blows.

Make sure you wear gloves to get the bell up on the wheel to save on splinters.

6) David Bagley sells an oddstruckness meter <http://www.ringing.demon.co.uk/osm/osm.htm> which is very good at measuring oddstruckness and bell and clapper swing times.

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