

This presentation is aimed mainly at archers shooting at 1st class and above, as well as L2 coaches

It does not cover more advanced fine tuning techniques

The presentation assumes that the archer is capable of shooting reasonably consistently, and that the arrows are the correct spine for the bow/archer (tuning will check this)

### Why Tune a bow

Tuning harmonises the bow/arrow/archer combination  
This results in good, consistent arrow flight, which is more tolerant of shot variations  
This gives consistent grouping at the level the archer can shoot

The diagram shows four circles of increasing size, representing arrow groupings at 30m, 50m, 70m, and 90m distances. The circles are arranged in a row, with the 30m circle being the smallest and the 90m circle being the largest.

We are aiming to get the bow to shoot as well as it can for an individual archer.

Good tuning will be more tolerant of shot variations, and will give the best grouping that the archer is capable of at all distances. Poor tuning might give better groups at one distance, e.g very stiff arrows may group very well at short distances but will not group well at long distances.

### Good basic arrow flight

Align Arrow Nodes

The diagram shows an arrow with two nodes marked. Below it are two photographs showing an arrow in flight, illustrating the concept of arrow nodes.

Arrows will flex around two fixed points - these are known as 'nodes'

Good tuning will result in the arrow nodes flying straight to the target while the arrow flexes around them.

This can be seen in the photographs, and observed in many online videos.

### Initial set-up assumptions

Basic set-up has been done

- Tiller
- Centreshot
- Bracing height
- Basic nocking point setting

Arrows are correct spine (from Easton charts etc)

Before we start, the bow should have been set in accordance with bow manufacturers guidelines, with tiller, centreshot, and bracing height set, and the nocking point set to a good initial basic setting (3/16" to 1/4" above square)

Arrows must be correct for the bow, as selected from manufacturer's arrow selection charts for draw weight and arrow length.

What do we adjust?

- Nocking point
- Centreshot
- Button Pressure
- And maybe more if we find the arrows are the wrong spine for the bow/archer

We're going to start by adjusting the nocking point, so it's useful to use an easily movable nocking point - e.g. masking tape, brass nocks, or points tied on with serving material and not glued in place (these can be twisted up and down the serving)

We'll also adjust the centreshot and button pressure, so it helps to be familiar with how the button is adjusted and to have the correct allen keys etc to hand.

Point to note

**Before you start:**

Record everything – if it all goes wrong you can put it back as it was

And record changes at each stage

Record everything before you start:

**Nocking point**

Button pressure (you can do this by pressing against a kitchen scale and noting the value at which it starts to move)

Centreshot setting (you can measure with a matchstick contacting the riser and mark the outer edge of button with a pen).

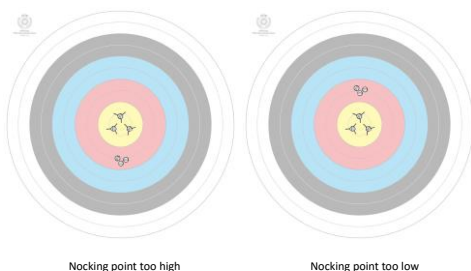
Bare Shaft Tuning Test

- This is a good basic test for correct arrow spine and for getting the nocking point and pressure button set up fairly well
- Shoot at around 15m to 18m (15yd to 20yd)
- Shoot 3 fletched and 2 or 3 unfletched arrows
- **Note – all diagrams are for a right handed archer.** Reverse them horizontally for a left handed archer

We start with a bare shaft test, shooting 3 fletched and 3 unfletched arrows at 15 to 18m (15 to 20 yd)

Please note that all diagrams are for right handed archers - please reverse these for left handed archers

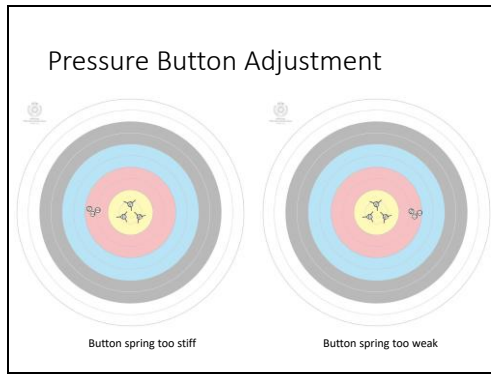
Nocking Point Adjustment



Always adjust nocking point first. Aim to get the fletched and bare shafts hitting at close to the same height.

It doesn't matter if they're left or right, only look at the height.

Once you have the nocking point set up correctly, move on to adjusting the button, But keep an eye on nocking point as one change can affect another, so readjust the nocking point as necessary



Adjust the spring pressure to move the bare shafts across from left to right or vice versa. Be careful you don't reduce the spring pressure too low, e.g. if the clicker compresses the spring, it's too light. If they move together and don't converge, probably the arrows are the incorrect spine - usually too stiff.

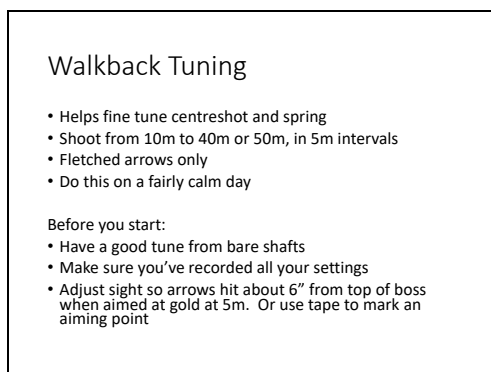
You may be able to adjust the centreshot slightly to compensate, or arrow point weight, but if you can't get the arrows within 6" horizontally you may need to adjust the bow weight up or down (or buy new arrows!)

This is what we're trying to achieve. You might have the bare shafts up to 1" low, and maybe up to 2" to the left.



At this point, please record everything again.

If you want to go further you can now move on to walkback tuning.



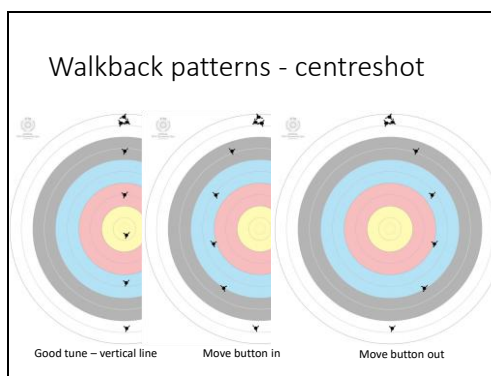
Walkback tuning should only be done after getting a good initial tune with bare shafts. Do this on a fairly calm day.

Get an aiming point so the arrows hit about 6" below the top of the boss at 10m. Then as you move back, don't adjust the sight.

The arrows will hit lower as you move back.

Move 5m at a time

If you get to the bottom of the boss, either stop or put another boss on the floor leaning against the frame.



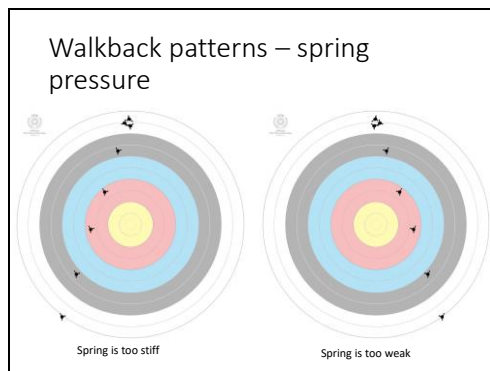
We're aiming for a vertical line.

If the arrow pattern bends, you should try to adjust the centre shot first to get a straight line even if it isn't vertical (see next slide).

A bend out to the left needs to the centreshot brought in towards the bow, out to the right needs it moved out.

Generally you should make small adjustments, e.g. 1/8 of a turn at a time, and repeat.

Some archers find the action of the button and spring reversed, but this presentation is based on the majority of texts and my own experience



Having achieved a straight line you can adjust the spring to get it vertical.

If it falls to the left, reduce spring pressure. If it falls to the right, increase pressure.

When you've finished the walkback, it can be worth going back and checking the bare shaft position. Don't change anything but record it - this can help you get back to the same tune if you accidentally change anything.

Also - record everything

## Summary

- We can only tune as well as we can shoot
- We tune the system, not the bow
- If anything changes (form, equipment, arrows) we should retune

Some top archers check tune with bare shafts frequently, even once a day!

It is worth checking occasionally, even if you think nothing's changed; small form changes or equipment wear can affect things. Even a new tab face can alter the bow tune significantly.

More advanced micro tuning can involve shooting at horizontal and vertical lines and making very small adjustments - this isn't covered here.

## References

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Ellison, S., 1998. Tenzone - Equipment - Tuning Test Guide. [Online] Available at: <http://tenzone.org.uk/Equipment/tuning/pdfs/tuning01.pdf> [Accessed 10 May 2017].

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<https://www.youtube.com/watch?v=EfyZL9C-8WY> [Accessed 9 Nov 2017]

