Factors Affecting Arrow Head Accuracy

Additional root causes that can affect arrow head accuracy

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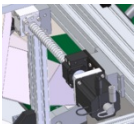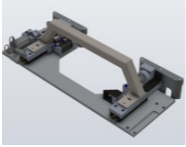# Machine Types

Arrow head setup on a Stuga machine falls into 3 different groups depending on the model of the machine and the centralising options fitted

	Standard	Full SY Axis	Y-Drive	Notes
Description	*Direct centralising on simple cylinder*	*No mechanical centralising, all on SY axis*	*Mechanical Centralising, with SY axis offset from centre*	
Standalone Saw	All			All saws have the standard centralising mechanics except cill saws where this is removed to enable wider (cill) profiles to be managed
Flowline / ZX3 / ZX4			Optional Refurbished with Y-Drive	All original flowlines, ZX3 and ZX4 have the standard centralise system, but following the development of the "Y-Drive" on the ZX5, this is offered as an option on refurbished machines
Microline		All		All Microlines have an "A" axis to control the arrow head position This axis position affects all cut types so also affects Mitred lengths
Autoflow		All		All Autoflows use SY axis to control arrow head position This axis position affects all cut types so also affects Mitred lengths
ZX5			All	The ZX5 uses a hybrid system where mitred cuts will use a fixed bladetofence measurement, coupled with the ability to offset on the SY axis when the centralising is on. This offset allows the blade to offset from centre for Y notching

T Transoms First

> ⓘ ..If you can't get T shapes correct, the you will never get Z profiles correct, so it is important to get reliability and repeatability on simple profiles first

The first important step is to gather reliable test data. Create test pieces 4 off 400mm of narrow, mid and wide T transoms
- Carefully check that the bars are symmetrical
- Use a test bar long enough to ensure the offcut is not at the start of the bar

> ⓘ ...We want to test the system where the first cut is an arrow head with infeed clamping only. If an offcut is at the start of the bar, it

- Label them 1, 2 and 3 and 4 as they come off the machine
- Carefully check the dimensions and symmetry of each profile - use the "front to front and back to front method" to check shoulder lengths against each other. This is a quick way to identify discrepancies and compare pieces
- Measure the arrow head location accurately and carefully to get an idea of how the arrow heads perform overall, rather than concentrating on one profile that the operator tells you is wrong.
- If there are any inconsistencies on a profile, repeat the same test - Do you get the same result?
- Test inconsistent profiles again - do you get the same result?

ℹ️ ...It is important to get consistent inconsistencies to be able to understand what to do about it

Root Cause Table - Standard Centralising and Y-Drive

Symptoms	Potential Root Cause	Checks
No issues found but history of: • All arrow heads out by the same amount on one bar or a set of bars in order, then correct again • Arrow heads out by a long way (>5mm) towards front of machine • Mitre cut lengths also short (not long)	Swarf or offcut stuck was stopping the centralise getting to position Top clamp pressure too high Centralise cylinder pressure too low (either / both will stop profile getting pushed to backfence) Centralise cylinder leaking past seal Centralise slideway system jammed / not lubricated / failure	Check the side fence reaches the profile when centralising Check clamp pressures top1-2bar, centralise 2-2.5bar Check centralise slideway mechanicals and lubrication
First or last arrow head on bar is different to others	Side fences not parallel Rear fences not aligned	TM016 Arrow Head Adjustment on Saw#Step 4 - Check Side Fences are Parallel
Some profile arrow heads correct, others profiles not. <u>Repeatable results on every test</u>	Arrow head offsets (fiddle factors) historically set	Reset all ofsets to zero before starting

Root Cause Table - Full SY Axis and Y Drive Only (Refurb Flowlines with SY upgrade, All ZX5s)

Symptoms	Potential Root Cause	Checks
Arrow heads varying with no pattern, changes after redatum SY axis stalling and has following errors	SY axis needs lubricating	Check SY axis moves full range of movement by hand and via drives screen
	SY axis sensor not functioning correctly	
	SY Axis Misaligned and stalling SY Axis coupling slipping	Check for following error / lag on SY axis
All arrow heads out by same amount	SY Axis Datum is wrong SY Axis Misaligned and stalling SY Axis coupling slipping	Check and double check offsets Check repeatability of SY axis datum visually (mark a line and repeatedly test datuming) ⚠️ ..You have to ask yourself why the SY axis datum position has changed - there has to be a root cause. Simply changing the parameter will mask the real problem and therefore guaranteed to return again minutes or days later

Z Transoms Second

Repeat the same tests for Z shaped profiles

Root Cause Table AFTER T Transoms correct - All Types

Symptoms	Potential Root Cause	Checks
Bottom arrow head is different to top First or last arrow head on bar is different to others	Z Support not active for profile Z support incorrectly set for profile rebate Infeed top clamp pressure not high enough to flatten profile	Check Z support settings Manually check how the Z profile is clamped with the Z support out Top Clamp pressure 1bar-2bar
One profile incorrect but others ok	Profile not symmetrical	Test Z transom Symmetry (can be difficult!)
Some arrow heads correct, others not, but fixed pattern, not varying along bar length	Arrow head offsets (fiddle factors) historically set	Reset all ofsets to zero before starting