

Accuracy Diagnosis - Mechanical Factors

Mechanical issues that can affect accuracy on Stuga machines

Contents

Comments

[Back To General Accuracy Guidelines](#)

The Mechanical systems on a machine are all prone to wear and tear, maladjustment, alignment, swarf ingress, lack of lubrication and collisions.

It is vital that all mechanics of the system are fully checked out and set and working correctly before any software adjustments are carried out

Mechanical Issue	Description	Link to Page	Common Symptoms	Affected Machines
Recent gripper crash - alignment	Following a gripper crash with profile, gripper position is out / does not grip properly		Gripper does not pick up profile correctly Gripper assembly is loose	All Particularlry Autoflow
Backlash in Ring	Ring gearing is worn and has developed backlash		Operation position in Y and Z varying randomly	All Except Autoflow.
Clamp Pressures - MH and Saw	Clamp pressures have been incorrectly adjusted and profile is not clamping correctly - ie not pushed to backfence /		Grip slip , X axis stalling or following error,Operational position in X,Y and Z vary.	All
Backlash Racks	The X axis Gripper or/And Saw pusher can be moved Back and forth when the drive is enabled.		Operational position in X axis will Vary, Slots may not be Very Square or Round. Also Saw backtoback Varying.	All
Pinion gear wear	Backlash cannot be eliminated from the rack and May effect the Main Scaling of the Rack		Operational Position in X axis will Vary along with Saw Backtoback Varying.	All
Gripper nose / gap	The Gap to Switch coming off is important for the amount of Grip Slip Allowed, 1mm is the normal amount allowed. Grip Nose should always be in front of Step on Gripper Jaw when bottomed out		Doesn't get onto grip switch correctly after a Trim Start. Large grip Gap will not help solving Backtoback accuracy issues.	All
Clamp / Rollers alignment	Rollers Seized up. Out of Alignment .		Lots of Grip Slip Alarms. Operations at Beginning or End of Bar differ from Middle of bar ,	All
Saw Clamp parallelism	Following a Profile Clash or Jamb the Front Rollers known as Saw Side/Centraliser Clamp is not Parallel to the Rear rollers		Known to Affect the 1st or Last Arrowhead on a Bar length and Cause inconsistent saw Sizes due to the change in friction.	All
Saw kerf	The Amount of waste Cut at 90 degrees, Basically the Saw Blade Thickness		Will Have a major affect on all Sizes and Accuracy setup if not entered correctly. Care must be taken on Older setups where it is a Shared Component.	All
Saw angles	Any error in the saw angles will cause a bad setup of machine.		Sizes are incorrect, Pieces do not weld up correctly.	All

Rear Rollers -Parallel to G axis - ZX4	G axis not Parallel to Rear Roller fences on Zx4 used for the V notch setup		V and Y Notches at Beginning of Bar or V and Y notches at the End of Bar will differ from those in middle of Bar.	ZX4
G axis parallel	Gripper axis must be Parallel to all rear roller/fence alignments within machining/cutting area's.		Operations at End/Beginning of Bar are not the same as Middle of Bar. Gripper knocks profile when unclamping and re gripping on Microline saw.	All
G axis datum	Position of Centre of Gripper jaw from Edge of Rear Fences. Important to check Minimum and Maximum the axis can safely move after Datum is set Then set End Stop Bolts correctly for Overtravels.		Profiles will Slip or not get gripped correctly, will cause Laser Measure Accuracy issues.	All
Laser alignment	Used where Machine cannot do a Trim Start and is the Datum point End of Bar	Laser Setup on Flowline/ZX3 for Laser Holes	Laser Hole Errors, Operational position in X axis varying randomly	ZX3 and ZX4 Non All in One Versions
Rack alignment / height				
V Notch bed height alignment (ZX4)	Small Platform on the Newer Machines with 200mm blades where a Bottom Bed is moved into position with the V or W axis. Must NOT be higher than Under rollers. Normally 0.2mm to 0.5mm lower than straight edge placed accross Under rollers,		V notch Depths will be wrong, And possible V and W axis errors.	ZX4
V notch blade setup	Critical for Accuracy that this is Correct. The setup of Parameters to Define the X axis Position along the Bar and also Depth offset of the Blades. There are 4 Blade Types Front Infeed and Outfeed Blade along with Rear Infeed and Outfeed Blade.		V notch Shape produced is Poor. V notch Depth is incorrect. V notch Backtoback differs from Holes backtoback. V notch correct depth but Y notches done by same blades Show always one side is Deeper than the other.	All
Seized rollers	Rollers used on Top, Bottom, Rear and Front on Infeed and Outfeed Sides of Main Multihead and Saws. Used under Low pressure to guide Profiles and Keep a low friction system .		Severe Grip Slipping issues, Possible Marking on some profiles and Varying Cut lengths.	All
Saw bed alignment	Critical setup for the Outfeed/Eject Beds to be aligned with the Fixed Infeed Beds.		Incorrect Arrowhead always one side, Tape peeling off. Wrong Angle on End cut of piece.	All except Ecoline.
Zip gate to grip height	Zip gates are used to Take the weight of the profile along the Outfeed table of the Multihead. It is important that the Gripper Height is a good 1mm higher than the Zip gates. All Zips gates need a Leading Edge for where profile is pulled onto them And also a leading edge at End Edge for when an Offcut is pushed back onto them.		Gripper slip issues. Offcuts get jammed on Loading to saw as Grip Push got jambed on unloading.	ZX3,ZX4 and Microline
gripper slip	This is where the Gripper Switch has come off when Profile is gripped. Normal Gap for Switch is 1mm before Switch goes off.		Machine is unusable with severe Gripper slips.	All

grip height to underrollers	There may be more than one point of contact here like a ZX4 so important that all Area's Checked. The Rule basically is Grip height should always Be in align with the Under rollers. Where one roller is Good the other one can be Lower than the Grip Height but Never Above. No more than 0.5mm Rollers Should have a Leading Edge.		Damage to profile where rollers goes in and out. Increases Friction causing Grip slips and Wear on Journals if force applied.	ZX4,ZX3 and Ecolines
zip gate opener fitted wrong way	The Zip Gates are designed to be opened By the Rubber Roller that spins underneath the gate, When Force applied it will roll as it opens the gate dampening the force.		If Opener fitted wrong way round the Zip gate Shafts and Plastic will slowly get destroyed and damaged until they cause issues. Also the Vibration will cause loose wires and Bolts to come loose.	ZX3,ZX4 and Microline
Journals	Journals are used to Keep the Rack aligned correctly and can be adjusted as they wear. Oiling this weekly and Keeping the rack clean helps Journal life		Can Change Gripper Height if loose, Will wear out Pinion Gear if excessive play. If fitted Incorrectly Pinion gear cannot be meshed to eliminate Backlash.	All
Infeed grip / pull pads	If worn then New Bars may not be loaded upto the Gripper Switch Deadbolt correctly.		Gripper slip issues and Possible Accuracy backtoback errors, but will be no more than twice Grip Switch Gap.	Flowline,ZX3,ZX4 and Microline
Saw infeed lift / load alignment	Bars need to be loaded onto saw so they are not forced Proud of Saw rear Fences and also Saw Bottom Pads. Platforms should be as level as possible.		Saw will Cut pieces Short if the Infeed holds it proud of Rear Fences and Bottom Beds. May Cause Servo Following errors or Stalling.	Flowline,ZX3,ZX4 and ZX5
Z blocks sticking out / badly adjusted	Rear or Front Z blocks used on Saw have either Seized or something is jamming them from returning and will effect the Profile going to the rear fence correctly on certain profiles.		Will effect Nearly all 45 45 Outerframe cut sizes by cutting small and maybe other profiles that are not Z shaped.	All Saws
Datum sensors	All 8mm Proximity Datum sensors should be set with a gap 0.2 to 0.5mm. And not be overtightened on the Main Lock nut. Roller Plunge or Roller Lever Limit Switches should be Straight, Tight, No Play and free of swarf for the switch to work correctly.		Will cause datum's to vary by either a Zero or Software Sync Pulse if used, Or an amount that is totally inconsistent.	All
Zero pulse on motor working	Used to get a more Accurate Datum of Drives. Z pulse is a Pulse given every one rotation of the Servo motor. Datum sequence is - Go onto Datum Switch, Reverse Direction until Switch goes Off and then Look for 1st Z pulse. Should always be Used on Gripper and Saw Pusher.		Can cause the Datum to Jump/Move by the amount Z pulse happens on the servo Motor. Y and Z axis can be 5 or 10mm, Saw Pusher and Gripper can be 32mm or 52mm. Will always Move Datum on Saw pusher and gripper if Motor taken out of mesh and bolted back on in a different position	All
Keyways	Keyways are Used on Nearly all Servo Motor, Gearbox and Ballscrew Shafts where a strong coupling Joint is required. There is normally a Grubscrew to lock of the Keyway.		Worn Keyways cause Backlash and will lead to Slots being wrong Position and size and inconsistent depending on much backlash there is.	All
Grubscrews loose	All Drive Axis's will have 1 or 2 Grubscrews to locate Pinion Gear onto shaft, Servo Motor Shaft Keyway into Gearbox Coupling, Ballscrew or Leadscrew coupling , Drive sprockets onto shafts.		A loose Grubscrew will lead to Backlash on an Axis , and if left too long will wear out Keyway, Coupling and Possible Shaft . Positions of slots and also sizes of slots will start to vary and get more inconsistent the more it wears or is left to get looser.	All

Sync pulse on Beckhoff systems	Used to get a more Accurate Datum of Drives. Z pulse is a Pulse given every one rotation of the Servo motor. Datum sequence is - Go onto Datum Switch, Reverse Direction until Switch goes Off and then Look for 1st Z pulse. Should always be Used on Gripper and Saw Pusher.		Can cause the Datum to Jump/Move by the amount Z pulse happens on the servo Motor. Y and Z axis can be 5 or 10mm, Saw Pusher and Gripper can be 32mm or 52mm. Will always Move Datum on Saw pusher and gripper if Motor taken out of mesh and bolted back on in a different position	All
Centraliser not getting to position	Saw Centraliser when Home is a fixed Value called Blade to Fence used for Calculating the Blade offsets used for cutting.		All Mitred Cuts - Non Centralised will cut incorrectly - It is Normally Always Undersize.	Saw
Saw Blade Cut damper	Used to Regulate the Cut Speed of the saw Blade cylinder for a Longer Life and wear on the blade and a controlled consistent cut.		Blade will blunt quickly as it jumps/jerks through profile. Can lead to profile Drag on Wider profiles when doing Lead or First cut of every piece at 45 degrees. Waste pieces not controlled.	Saw
Grip finger angle	Grip Jaw should be straight when Screwed into its holder and come down parallel when grip on pressure applied.		Grip slips will occur.	All
Grip push too far	Grip pushed used to Control the Push of the Profile Away from the Gripper Jaw. Needs be set at a controlled rate on the cylinder Speed controls.		Damages Outfeed Beam Reflector. Gets Ejected at an Angle.	All
Saw top clamp pressure - Hi / Low	Used on Low pressure to guide the Bar, Goes to high Pressure when X axis is in Position and Saw is going to cut. Low Pressure Normally set 1 -1.5 bars		If too high it will mark foiled profiles, twist End waste bits at end of bar, Causes overshoot on Servo drive as Load is large with more pressure on.	All Saws