SZ Axis Bottoming Out on Autoflow

This page describes the diagnostic processes to go through to check if an Autoflow SZ axis is getting jammed with swarf at the bottom of its travel

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Problem

A regular issue on an Autoflow is the SZ axis getting blocked by swarf. The blade datums at a position around -17mm down from the saw blade table, and then moves to a "safe" position of around -27mm below the tabel. This "-27mm" distance is controlled by the "moveAfterDatum" parameter on the Axes tab.

It is common for swarf to build up and to keep getting compacted so that the axis cannot reach the -27mm lower limit. This can be a progressive problem, getting worse a tiny bit day by day.

The axis will try its hardest to overcome the swarf and will lead to a few different symptoms:

- Error 76 Drive Error on SZ axis
- Press Start to initialise, but then no Start to begin cutting message
- SZ axis motor excessively hot
- SZ Axis motor failure

Checking for this issue

It is important to understand how to check if this issue is happening, as it is easy to ask the operator to clear the swarf, and they can promise they have done it, but the problem still remains.

Checking Required Position vs Actual

Checking the moveAfterDatum position against the actual axis position is one way of doing this.

The moveAfterDatum position is found on the axes tab (in this case -27)

atum	Tests Ac	curacy Pa	rameters	Axes	Cooling IC	Map Clar	nps ×Hold	ls Alams	Profile	Colours	Notchin
	Name	Scale	Speed	Accel	Decel	Datum	Move	HomeSp	FolErr	GN	KV
•	GX	27812	2000	3000	5000	7290	7300	200	200	10	0
	GY	45.86	100	100	200	6	35	20	25	20	0
	GZ	45.86	100	100	100	54	45	10	25	50	0
	Y	104857.6	500	1000	1000	-4.2	0	50	50	1	0
	Z	104857.6	500	1000	1000	-26.5	0	50	50	1	0
	R	148062.8	250	1000	1000	0.2	0	20	50	10	0
	SY	409.6	15	100	100	49.3	20	10	50	100	0
	SZ	104857.6	500	3000	5000	-17	-27	10	50	1	0
	SR	296125.4	250	400	400	129	90	6	50	1.5	1

The Drives tab (from Settings window) shows the actual position of the SZ axis (in this case -27)

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Clear Blockages Bar Data Tests IO IO-Infeed Spindle IO Accuracy Drives Profiles Ar

	7300.0	+	Home	Move	0.0	Stop
GY Axis (No:	2 ld:2)					
	35.0	+	Home	Move	0.0	Stop
GZ Axis (No:	3 ld:3)					
-	45.0	+	Home	Move	0.0	Stop
Y Axis (No: 4	ld:4)					
	0.0	+	Home	Move	0.0	Stop
Z Axis (No: 5	ld:5)					
-	0.0	+	Home	Move	0.0	Stop
R Axis (No: 6	ld:6)					
	0.0	+	Home	Move	0.0	Stop
SY Axis (No:	7 ld:7)					
•	30.0	+	Home	Move	0.0	Stop
SZ Axis (No:	8 10/8					
	-27.0	+	Home	Move	0.0	Stop
SR Avia INco	9149					

In the above case: Required = -27 and actual=-27, therefore the axis is not bottoming out. if the numbers are different, there is a blockage creating a problem

Checking Motor Temperature

Obvious way is to touch the motor! If this is not possible, or a more scientific test is required, the motor temperature is fed back to the Drive Manager tab on the TwinCAT system.

Open the visual studio project for the machine (this will be on the Camera PC)

Devices Device 3 (EtherCAT) and navigate to the SZ and SR Drive: image image-2 image-Info utput InfoData Drive GX (AX5103-0000-0203) Module A (EK1100) FB01A (EP2338-0001) FB02A (EP2338-0001 FB03A (EP2338-0001 E03A (EP2338-0001) FB04A (EP2338-0001) FB14A (EP2338-0001) FB05A (EP2338-0001) FB05A (EP2338-0001) FB07A GY (EP7041-0002) FB07A GY (EP7041-0002) FB06A GZ(EP7041-0002) ■ Drive Y & Z (AX5203-0000-0203)
■ Drive R (AX5112-0000-0203) Click on Drive Manager (1) and Watch Window (2) Module B(EK1100) F801B (EP2338-0001) F802B (EP2338-0001) F814B (EP2338-0001) The motor temperature for the SZ axis (3) can be compared to the temperature of the SR axis (4) FB15B (EP2338-0001) FB16B (EP2338-0001 They should be pretty much the same. FB18B (EP2338-0001 FB11B (EP2338-0001 B12B (EP2338-000 Module F (EK1100 FR01F (EP2338-00 In this particular case, the SZ axis temperature was 68 degrees - which would be too hot to touch, the SR is 0-0 1ager NC-B. Online NC-B. Functions NC-A: Online NC-A: Fun hameBooNC: Avis SR \$ \$ L | E = 2 | \$ Q X \$? | 0. Di Au YTICS 0.0 DC bus voltage (V) \$01.0 PCB temperature (*C) \$1.0 Solutions Digital Input 3 Digital Input 4 The obvious solution is to remove the swarf blockage, but sometimes it is not possible to 4 Chel \$22 20.9 get the operator to find the root cause (1) 13 22

A work-around is to increase the moveAfterDatum value to a figure greater than the minimum position the SZ axis can get to.

For example: SZ axis position from drives screen = -27.1mm moveAfterDatum value =-28.

Change moveAfterDatum value to -27mm

OK DoLink OK Ampl-Te. Actual op.. 47.0 2 velo control

47.0