



PRIMARY DEVELOPER: Glenn Wisniewski – Henry Ford College

SMC Fault List

SMC Faults: Station 1

Switch No. (Avx)		Checked Out	Category	Notes
1	Wiring of Start Push Button (m) OPEN	x	2	
2	Wiring of Manual /Automatic selector (a/m) OPEN	x	2	
3	Magnetic switch of body feeding cylinder (f1) OPEN	x	1	
4	Vacuum switch (v) OPEN	x	1	
5	Magnetic detector of position detection cylinder (d1) OPEN	x	1	Ejector rejects the part as if upside down.
6	Wiring of stop push-button (p) FAILED ON	x	2	Saw no effect on operation of machine - Stop button simply won't shut down the machine.
7	Magnetic detector of the transfer cylinder (e1) OPEN	x	1	
8	Bottom magnetic detector of vertical cylinder of body manipulator (b1) FAILED ON	x	1	Vac. Unit drops the part before lower it to the pallet.
9	Forward magnetic detector of horizontal cylinder of body manipulator (a1) FAILED ON	x	1	Motion a will not advance - ADV input is already ON
10	Rear magnetic detector of horizontal cylinder of body manipulator (a0) FAILED ON	x	1	normal operation except pallet stop / lifter kicks pallet on the way out. Odd reaction?????
11	Upper detector of vertical cylinder of body manipulator (b0) FAILED ON	x	1	vacuum unit stops in lowered position.
12	Detector wiring (f0)			Saw no effect on operation.... Just didn't light the LED on the sensor. Nobody would ever fix this because it would go undetected until some other breakdown.
13	Solenoid valves wiring (B+ & E+) are swapped	x	3	This happens often while commissioning new equipment.
14	Solenoid valve of horizontal cylinder of body manipulator (A+ & A-) OPEN	x	1	Open in the output wiring to solenoid. Solenoid light does not light.
15	Vacuum pods solenoid valves (V+) OPEN	x	1	open in the wiring to the solenoid valve. Solenoid valve light does not light
16	Input wiring swapped (b0 & b1)	x	3	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
N/A	Part improperly loaded / Operator error	x	1	
N/A	Pallet limit switch lower out of position	x	1	
N/A	close down flow control valve on any motion.	x	3	

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SMC Fault List

SMC Faults: Station 2

Switch No. (Avx)		Checked Out	Category	Notes
1	Wiring of Start Push Button (m) OPEN	x	2	
2	Magnetic detector of feeding cylinder (a1) OPEN	x	1	
3	Wiring of Reset push-button (r) OPEN	x	2	
4	Wiring of Part Present microswitch (pr) OPEN	x	1	
5	Magnetic switch of rotary actuator (b2) OPEN	x	1	
6	Wiring of stop push-button (p) FAILED ON	x	2	Saw no effect on operation of machine - Stop button simply won't shut down the machine.
7	Potentiometer (Analog input): The potentiometer is measuring wrongly the height of the bearing			Skipped this, as you would need to be running a specific bearing height - which we are not doing currently.
8	Initial magnetic switch of rotary actuator (b0) FAILED ON			This actually caused the unit to drop the bearing then smash it into the (R) part present switch.
9	Wiring of selector step-automatic (a/m) FAILED ON - unit is ALWAYS in MANUAL	x	2	
10	Bottom magnetic switch of the rotary-linear cylinder (g1) FAILED ON	x	1	
11	Upper magnetic detector of the rotary-linear cylinder (g0) FAILED ON	x	1	This is very subtle. You have to watch closely to even notice something is wrong.
12	Wiring of the detector (d0)			Saw no effect on operation.... Just didn't light the LED on the sensor. Nobody would ever fix this because it would go undetected until some other breakdown.
13	Solenoid valves wiring (B+ & B-) Swapped	x	3	ONLY indication is the wrong valve light is lit on the "B" motion. This is a tuffy!
14	Gripper solenoid valve (C+) OPEN	x	1	
15	Solenoid valve of measuring cylinder (D+ & D-) D+ OPEN	x	1	No light on sol.
16	Inputs' wiring (h0 & h1) Inputs SWAPPED	x	3	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
N/A	Part improperly loaded / Operator error	x	1	
N/A	Pallet limit switch lower out of position	x	1	
N/A	close down flow control valve on any motion.	x	3	

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SMC Fault List

SMC Faults: Station 4

Switch No. (Avx)		Checked Out	Category	Notes
1	Wiring of selector step-automatic (a/m) OPEN - unit is ALWAYS in AUTO	x	2	You don't know anything is wrong unless you try to go to Manual.
2	Detector of Insertion manipulator cylinder (b0) OPEN	x	1	Just prevents LED on switch from lighting. No effect on operation
3	Vacuum detector (v1) OPEN	x	1	
4	Magnetic detector of indexing plate (j0) OPEN	x	2	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
5	Inductive detector (dm) OPEN		1	Skipped this one, as we are not sorting between metal and non-metallic parts.
6	Wiring of stop push-button (p) FAILED ON	x	2	Saw no effect on operation of machine - Stop button simply won't shut down the machine.
7	Capacitive detector (dp) OPEN	x	1	
8	Magnetic switch of shaft verifying cylinder (f1) FAILED ON	x	1	There must be shafts feed upside down to notice this fault
9	Rear magnetic detector of Horizontal Cylinder of manipulator (d1) FAILED ON	x	1	Only noticeable if you are rejecting parts that are / are Not metallic. We aren't doing this currently.
10	Bottom magnetic detector of the insertion manipulator (a0) FAILED ON	x	1	actually causes unit to drop the part in place on the turntable. This could cause some problems if it is allowed to index an additional station.
11	Bottom detector of vertical cylinder of the manipulator (g1) FAILED ON	x	1	There must be shafts feed upside down to notice this fault
12	Detector wiring (a1)	x	1	Saw no effect on operation.... Just didn't light the LED on the sensor. Nobody would ever fix this because it would go undetected until some other breakdown.
13	Solenoid valves wiring (C+ & D+) Swapped		3	Only noticeable if you are rejecting parts that are / are Not metallic. We aren't doing this currently.
14	Solenoid valve of shaft delivering. (E+) OPEN	x	1	
15	Solenoid valve of rotary actuator (H+) OPEN	x	1	There must be shafts feed upside down to notice this fault. Also got terribly out of sequence and required restart / cycle power.
16	Inputs' wiring (c0 & c1) SWAPPED	x	3	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
N/A	Part improperly loaded / Operator error	x	1	
N/A	Pallet limit switch lower out of position	x	1	
N/A	close down flow control valve on any motion.	x	3	

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SMC Fault List

SMC Faults: Station 5

Switch No. (Avx)		Checked Out	Category	Notes
1	Wiring of START push-button (m) OPEN	x	2	Permissives required to initiate motion
2	Detector of positioning over the plate (b1) OPEN	x	1	
3	Vacuum switch detector (v) OPEN	x	1	This will only work when sorting between metal and non-metallic parts.
4	Linear encoder	x	3	would only be noticeable if you were sorting by height.
5	Inductive detector (dm)		1	would only be noticeable if you are sorting by type of material - skipped this one.
6	Bottom magnetic detector of vertical cylinder of the plate loading manipulator (a1) FAILED ON	X	1	
7	Photoelectric detector (dc)			Supposed to detect different colors. Skipped this one.
8	Upper magnetic detector of vertical cylinder (g0) FAILED ON	x	1	Would only be noticeable if rejecting parts
9	Rear magnetic detector of Horizontal Cylinder of manipulator (f0) FAILED ON	x	1	Would only be noticeable if rejecting parts
10	Wiring of selector step/ automatic (a/m) FAILED ON	x	2	Unit is always in Manual
11	Forward magnetic switch of the insertion manipulator (i1) FAILED ON	x	1	
12	Detector wiring (i0)	x	1	Saw no effect on operation.... Just didn't light the LED on the sensor. Nobody would ever fix this because it would go undetected until some other breakdown.
13	Solenoid valves wiring (F+ & F-)			Would only be noticeable if rejecting parts. Skipped this one
14	Solenoid valve of gripper (C+) OPEN	x	1	Gripper doesn't close - system keeps going - there ids no check for gripper closed in the logic.
15	Solenoid valve of Height measurement cylinder (L+) OPEN	x	1	System operates normally - the cylinder just doesn't stroke up and down
16	Input wiring (h0 & h1) Inputs SWAPPED	x	2	Permissives / Initial position cannot be reached.
N/A	Part improperly loaded / Operator error	x	1	
N/A	Pallet limit switch lower out of position	x	1	
N/A	close down flow control valve on any motion.	x	3	

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SMC Fault List

SMC Faults: Station 6

Switch No. (Avx)		Checked Out	Category	Notes
1	Wiring of START push-button (m) OPEN	x	2	Permissives required to initiate motion
2	Magnetic detector of the gripper (c1) OPEN	x	1	
3	Magnetic detector of vertical cylinder of insertion manipulator (b0) OPEN	x	2	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
4	Magnetic detector of horizontal cylinder in transfer manipulator (e0) OPEN	x	2	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
5	Magnetic detector of gripper (c0) OPEN	x	2	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
6	Wiring of stop push-button (p) FAILED ON	x	2	Saw no effect on operation of machine - Stop button simply won't shut down the machine.
7	Magnetic detector of horizontal cylinder of insertion manipulator (a0) OPEN	x	2	Permissives / normal start position not attainable. THIS ONE IS TOUGH!!!!
8	Wiring of selector of Step/Automated (a/m). FAILED ON	x	2	Manual works - cannot get out of Manual.
9	Magnetic detector of horizontal transfer cylinder (e1) FAILED ON	x	1	Interesting fault!!!! Part is processed - just never gets any bolts
10	Magnetic detector of vertical cylinder on insertion manipulator (b1) FAILED ON	x	1	does cause some binding of the screws at slide E
11	Magnetic detector of horizontal cylinder on insertion manipulator (a1) FAILED ON	x	1	Interesting fault. Part is processed without bolts and first bolt fed stays in the slide nest. SOMEONE needs to catch the bolts that re being fed!!!
12	Detector wiring (a1)	x	1	Saw no effect on operation.... Just didn't light the LED on the sensor. Nobody would ever fix this because it would go undetected until some other breakdown.
13	Solenoid valves wiring of insertion manipulator (B+) and gripper (C+) OUTPUTS SWAPPED	x	3	
14	Solenoid valve of the horizontal cylinder (A+) OPEN	x	1	
15	Solenoid valve of the transfer cylinder (E+) OPEN	x	1	
16	Inputs' wiring (b1 & e1) SWAPPED	x	3	
N/A	Part improperly loaded / Operator error	x	1	
N/A	Pallet limit switch lower out of position	x	1	
N/A	close down flow control valve on any motion.	x	3	

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