Troubleshooting Program

D-20XX Troubleshooting Program

The Troubleshooting Program allows reading of inputs (switches, etc.) and writing to outputs (valves, motors, etc.). This allows maintenance technicians to individually test components and identify potential issues.

Machine Sections

Winding (Coiler) Side

Includes:

1. Spindle Drive
2. Cut and Transfer
    a. “Cutter / Grabber” Mechanism (D-200)
    b. Transfer Arm (D-2050)
3. Turret, Mandrel and Endforms
4. Tube Inserter
5. Buffer
6. Anti-Reverse

Boxing Side

Includes:

1. Box Folding Table
    a. Ball Screw Drive (D-2000)
    b. Servo (D-2050)
2. Box Load Magazine including safety inhibits
3. Vertical Glue Cylinder
4. Glue Applicator
5. Exit Conveyor

Entering Troubleshooting Program

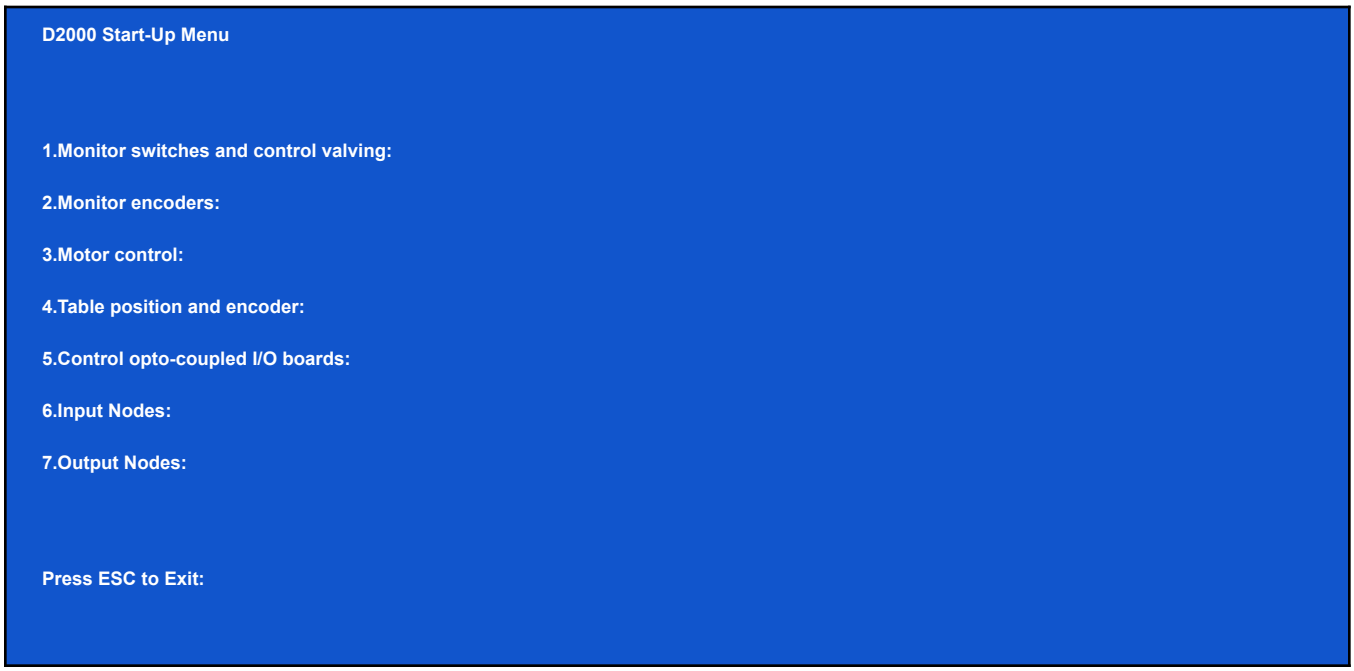
WARNING: Experienced personnel only! Keep personnel away from moving parts!
Damage to parts could occur without careful adjustments. Before attempting to move any parts make sure parts will not hit each other. Also make sure all persons are clear of any moving parts before moving them.

1. To enter the troubleshooting program, the machine should be E-Stopped
2. Switch the “GUARDING BYPASS SWITCH” to the bypass position. This will bypass the guarding and apply power to the outputs on the machine allowing free movement of parts without restrictions.

3. Attach spare keyboard where the small keyboard is attached at the monitor console.
4. Pull out all E-STOPs and press the E-STOP RESET button.
5. While the computer starts up hold F5 to stop the autoboot function.
6. When C: prompt is seen, enter dee2013.exe or other .exe program that is not D2000.exe. This will bring up the troubleshooting program.

NOTE: To ensure the autoboot function is enabled again, cycle power after all troubleshooting program needs are satisfied.

7. The following screen will appear:



To select a function, hit the appropriate number that corresponds to the function. For example, to monitor switches and control valving hit the number one on the keyboard/pad. It will bring up another screen pertaining to that function.

NOTE: To get out of the troubleshooting program, E-STOP the machine and follow instructions on how to start up the machine after an E-STOP condition.

Function 1 – Monitor Switches and Control Valving

If number 1 is pressed on the keyboard/pad, the following screen will come up:

STATUS OF DEVICE NET RAM

	MAC ID#			MAC ID#	
OUT 1A--;	0 0 0 0 0 0 0 0 0	IN 10--;	1A	1 0 0 0 1 0 1 1	139
OUT 1B--;	0 0 0 0 0 0 0 0 0	IN 11--;	1B	0 0 0 0 1 0 0 1	9
OUT 2A--;	0 0 0 0 0 0 0 0 0	IN 12--;	2A	0 0 0 0 1 1 0 0	12
OUT 2A--;	0 0 0 0 0 0 0 0 0	IN 13--;	2B	1 1 1 0 1 0 0 0	232
OUT 3A--;	0 0 0 0 0 0 0 0 0	IN 14--;	3A	0 1 0 1 0 1 1 0	86
OUT 3A--;	0 0 0 0 0 0 0 0 0	IN 15--;	3B	1 0 0 0 1 0 1 0	138
OUT 4A--;	0 0 0 0 0 0 0 0 0	IN 16--;	4A	1 1 1 0 1 0 0 0	232
OUT 5A--;	0 0 0 0 0 0 0 0 0	IN 1C--;	5A	1 0 1 0 1 0 0 1	169
OUT 5A--;	0 0 0 0 0 0 0 0 0	IN 1D--;	5B	0 0 0 0 1 0 0 0	8
OUT 6A--;	0 0 0 0 0 0 0 0 0	IN 22--;	6A	0 1 0 0 1 0 0 1	73
OUT 6A--;	0 0 0 0 0 0 0 0 0	IN 23--;	6B	0 0 1 0 1 0 0 1	41
OUT 6C--;	0 0 0 0 0 0 0 0 0	IN 28--;	7A	1 0 0 1 0 0 0 0	144
OUT 7A--;	0 0 0 0 0 0 0 0 0	IN 29--;	7B	0 1 1 0 1 0 0 1	105
OUT 7B--;	0 0 0 0 0 0 0 0 0	IN ----;		1 1 0 0 1 0 0 1	203
OUT ----;	0 0 0 0 0 0 0 0 0	IN ----;		1 0 0 0 1 0 1 1	139

OUT PORT:

Press ESC to go back to the previous screen.

OUT refers to outputs and IN refers to inputs. The “MAC ID #” is the number of the Devicenet connection.

Outputs:

For example: The “MAC ID” of “OUT 1A” refers to NODE 1A. On “NODE 1A” there are 8 bits (eight output devices) that corresponds to the zeros across from the “MAC ID”. The zeros indicate that all the valves are off. If there are any “ones” on those 8 bits that indicates they have been turned on.

To turn on a device, enter the MAC ID #, a period, and a number. Each bit has a value. For example the first bit (the zero furthest to the right of the 8 numbers) has a value of one. These numbers are combined to turn on multiple devices. To find out what device corresponds to which MAC ID #, please see the

manifold drawings (#20096, #20600 and #20601). To turn devices off, enter a new number or to turn all devices off on a particular terminal enter a zero for that terminal.

For example, to send the “CUTTER/GRABBER HORIZONTAL IN” enter the following: 1A.01 and then hit enter. If the period is forgotten, an invalid MAC ID is entered, or an invalid value is entered it must correctly re-entered.

The number furthest to the right is the combined value of that particular NODE. If the number is 5 that means the following devices have been turned on: 4(Bit 2), and a 1(Bit 0).

See chart below for values of each bit.

Bit:	7	6	5	4	3	2	1	0
Value:	128	64	32	16	8	4	2	1

The screen output will look like this if a [1A.132] is entered:

STATUS OF DEVICE NET RAM

	MAC ID#			MAC ID#	
OUT	1A--;	1 0 0 0 0 1 0 0 132	IN 10--;	1A 1 0 0 0 1 0 1 1	139
OUT	1B--;	0 0 0 0 0 0 0 0 0	IN 11--;	1B 0 0 0 0 1 0 0 1	9
OUT	2A--;	0 0 0 0 0 0 0 0 0	IN 12--;	2A 0 0 0 0 1 1 0 0	12
OUT	2A--;	0 0 0 0 0 0 0 0 0	IN 13--;	2B 1 1 1 0 1 0 0 0	232
OUT	3A--;	0 0 0 0 0 0 0 0 0	IN 14--;	3A 0 1 0 1 0 1 1 0	86
OUT	3A--;	0 0 0 0 0 0 0 0 0	IN 15--;	3B 1 0 0 0 1 0 1 0	138
OUT	4A--;	0 0 0 0 0 0 0 0 0	IN 16--;	4A 1 1 1 0 1 0 0 0	232
OUT	5A--;	0 0 0 0 0 0 0 0 0	IN 1C--;	5A 1 0 1 0 1 0 0 1	169
OUT	5A--;	0 0 0 0 0 0 0 0 0	IN 1D--;	5B 0 0 0 0 1 0 0 0	8
OUT	6A--;	0 0 0 0 0 0 0 0 0	IN 22--;	6A 0 1 0 0 1 0 0 1	73
OUT	6A--;	0 0 0 0 0 0 0 0 0	IN 23--;	6B 0 0 1 0 1 0 0 1	41
OUT	6C--;	0 0 0 0 0 0 0 0 0	IN 28--;	7A 1 0 0 1 0 0 0 0	144
OUT	7A--;	0 0 0 0 0 0 0 0 0	IN 29--;	7B 0 1 1 0 1 0 0 1	105
OUT	7A--;	0 0 0 0 0 0 0 0 0	IN ----;	1 1 0 0 1 0 0 1	203
OUT	----;	0 0 0 0 0 0 0 0 0	IN ----;	1 0 0 0 1 0 1 1	139

OUT PORT:_ port= 1

Inputs:

For example: The “MAC ID” of “IN 1A” refers to the first 8 bits of NODE 1. On “NODE 1A” there are 8 bits (eight input devices) that corresponds to the zeros and ones across from the “MAC ID”. The zeros indicate that the devices are off. A one would indicate a certain input was on.

Each bit has a value. For example, the first bit (the number furthest to the right of the 8 numbers) has a value of one. To find out what device corresponds to which MAC ID #, please see the switch drawings (#20631 and #20625).

The number furthest to the right is the combined value of that particular “TERMINAL”. If the number is 139 that means the following devices are on: 128 (Bit 7), 8(Bit 3), 2(Bit 1), and a 1(Bit 0).

See chart below for values of each bit.

Bit:	7	6	5	4	3	2	1	0
Value:	128	64	32	16	8	4	2	1
Hex Address (Wire#):	80	40	20	10	08	04	02	01

To change the status of a particular input device, move a part manually or output to the appropriate output device.

Function 2 – Monitor Encoders

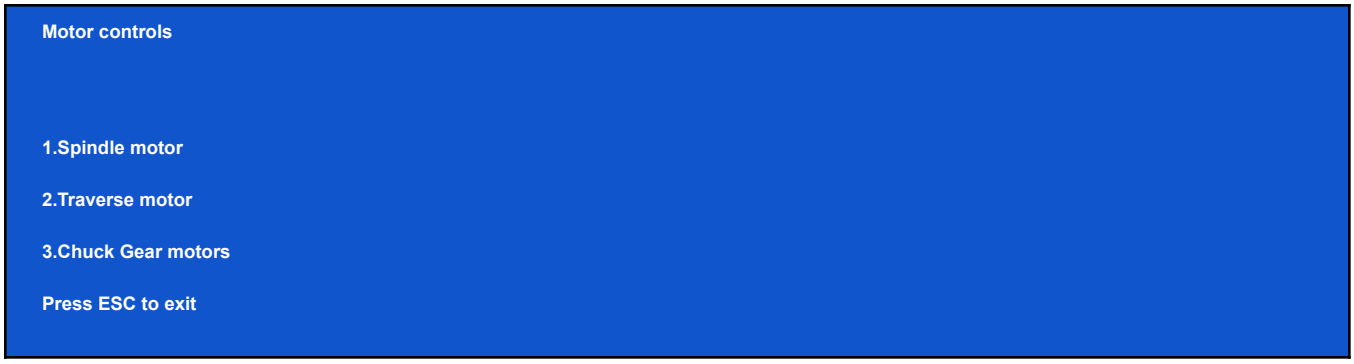
If number 2 is pressed on the keyboard/pad the following screen will come up:

Press ESC to go back to the previous screen.

Looking at this screen allows reading each of the encoders. This is helpful in determining whether or not they are working correctly as well as to make sure the counter boards (W602 & W603) are working properly. The number will increase in the forward direction and decrease in the reverse direction. The numbers for the spindle and traverse should range from 0 to 719 and the table range is 0 to 65,535 although the max is around 30,000. Zero is read on the table encoder when the table is all the way back or retracted towards the glue machine.

Function 3 – Motor Control

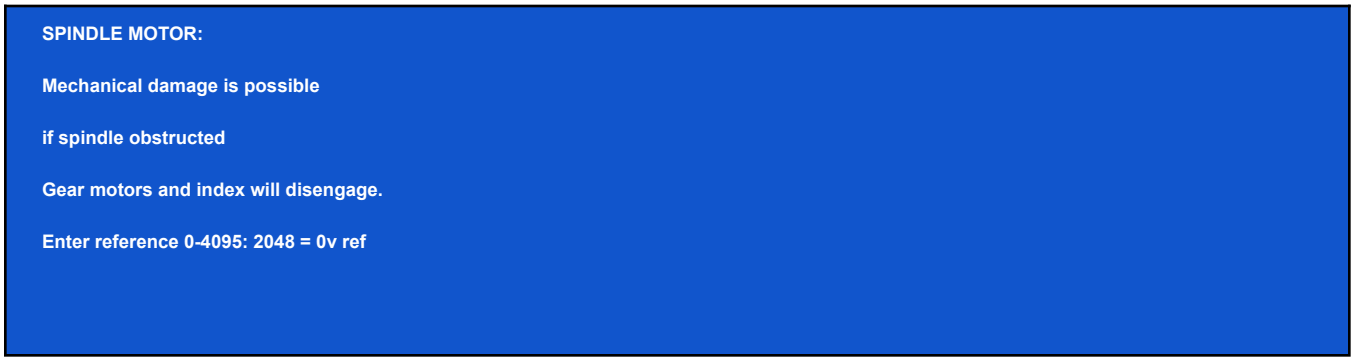
If number 3 is pressed on the keyboard/pad the following screen will come up:

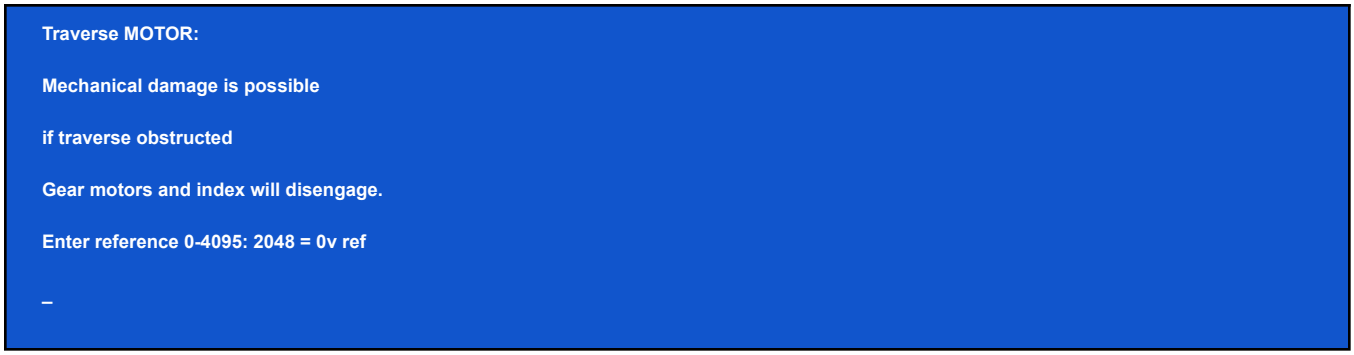


Press ESC to go back to the previous screen.

Select the appropriate motor.

Spindle Motor and Traverse Motor



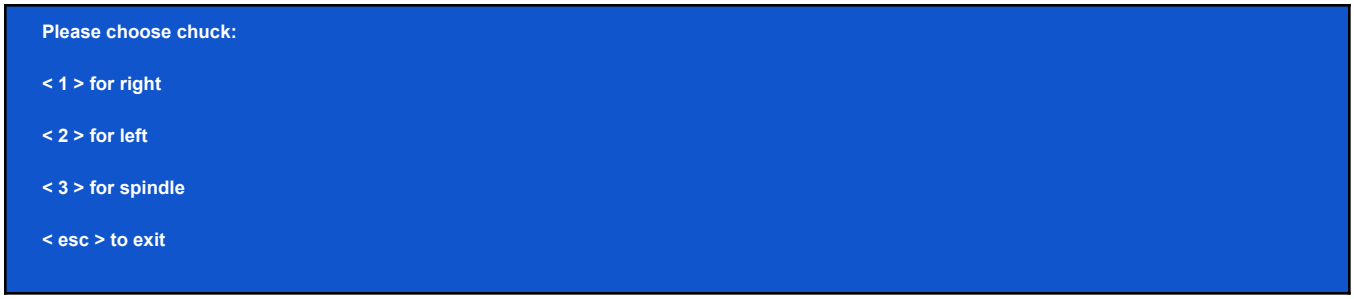


Enter a number from 0 to 4095. 2048 is 0v reference. Anything entered lower than 2048 will go in the reverse direction and anything higher than 2048 will go in the forward direction. Press [e] to enable the motor or [esc] to ESC. Once the motor is enabled, press [d] to disable the motor or [esc] to ESC.

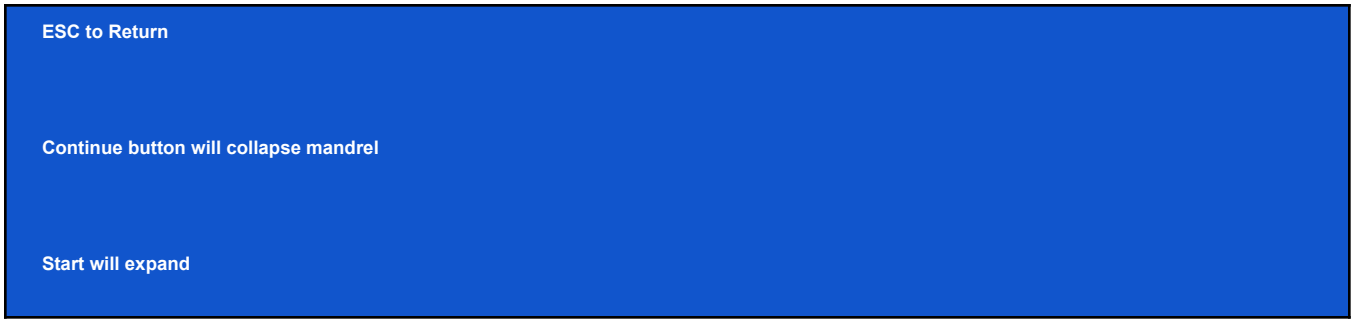
Gear Motors

When Chuck Gear Motor is selected the following screen will be displayed:

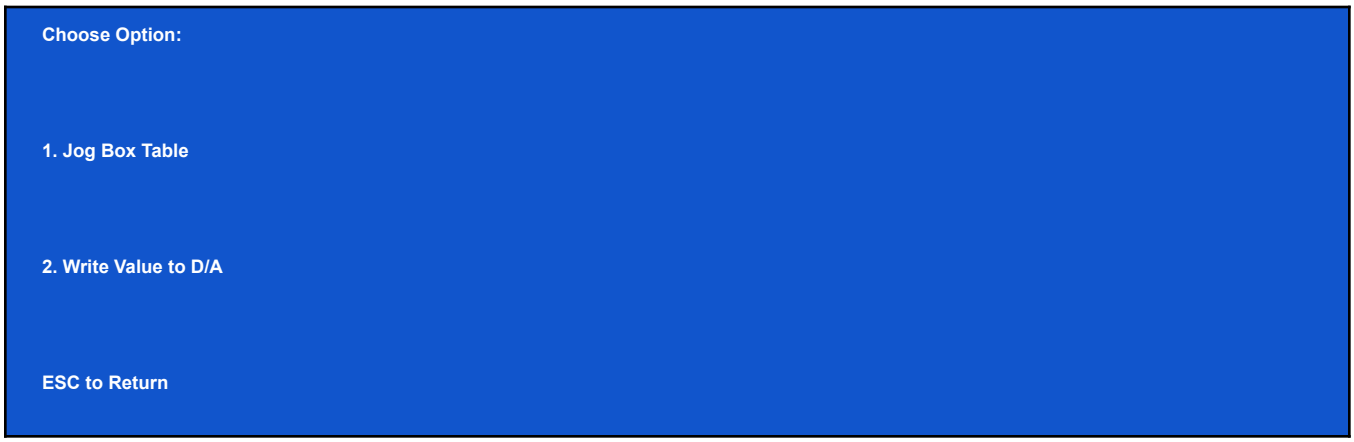
After the continue button is pressed, select the chuck to be tested.



Hit the continue or pause button to open or close the appropriate chucks.



When Box Table Drive is selected the following screen will be displayed:



Function 4 – Table Position and Encoder

If number 4 is pressed on the keyboard/pad the following screen will come up:

Press ESC to go back to the previous screen.

Press a key to continue.

After the table resets, enter a number:

The table will position according to the number entered. A zero will send the table all the way back towards glue machine. After the table positions, the program will go back to the main menu.

Function 5 – Control Opto-Coupled I/O Boards

If number 5 is pressed on the keyboard/pad the following screen will come up:

Press ESC to go back to the previous screen.

“OUT” refers to outputs and “IN” refers to inputs. There are 3 8-bit ports on each board. There are 2 boards (1 input board and 1 output board). This makes a total of 24 inputs and 24 outputs.

Outputs:

There are 3 output ports (OUT A0, OUT A1, & OUT A2). The zeros indicate that all the devices are off. If there are any “ones” on those 8 bits, that indicates they have been turned on.

To turn on a device, enter the output port, a period, and a number. Each bit has a value. For example the first bit (the zero furthest to the right of the 8 numbers) has a value of one. These numbers are combined to turn on multiple devices. To find out what device corresponds to which output port please see the drawing #20615. To turn devices off enter a new number or to turn all devices off on a particular terminal enter a zero for that terminal.

For example, to turn on the “TOWER BUZZER”, enter the following: A0.01 and then hit enter. Forgetting the period, entering an invalid “OUTPUT PORT”, or an invalid value will not be accepted.

The number furthest to the right is the combined value of that particular “PORT”. If the number is 5, that means the following devices have been turned on: 4(Bit 2), and a 1(Bit 0).

See chart below for values of each bit.

Bit:	7	6	5	4	3	2	1	0
Value:	128	64	32	16	8	4	2	1

The screen output will look like this if a [A0.05] is entered:

Inputs:

For example: on “IN B0” there are 8 bits (eight input devices) that corresponds to the zeros and ones across from the “INPUT PORT”. The zeros indicate that the devices are off. A one would indicate a certain input was on.

Each bit has a value. For example, the first bit (the number furthest to the right of the 8 numbers) has a value of one. To find out what device corresponds to which ‘INPUT PORT”, please see the switch drawing #20615.

The number furthest to the right is the combined value of that particular “TERMINAL”. If the number is 139 that means the following devices are on: 128 (Bit 8), 8(Bit 4), 2(Bit 2), and a 1(Bit 1).

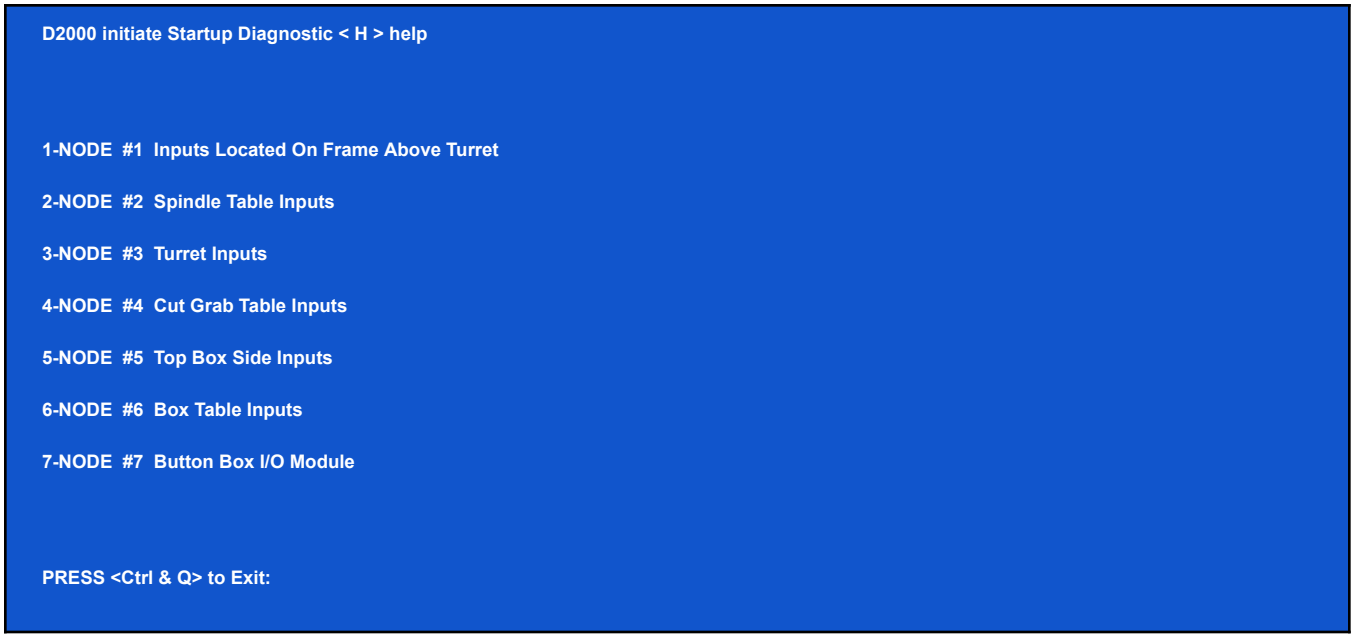
See chart below for values of each bit.

Bit:	7	6	5	4	3	2	1	0
Value:	128	64	32	16	8	4	2	1
Hex Address (Wire#):	80	40	20	10	08	04	02	01

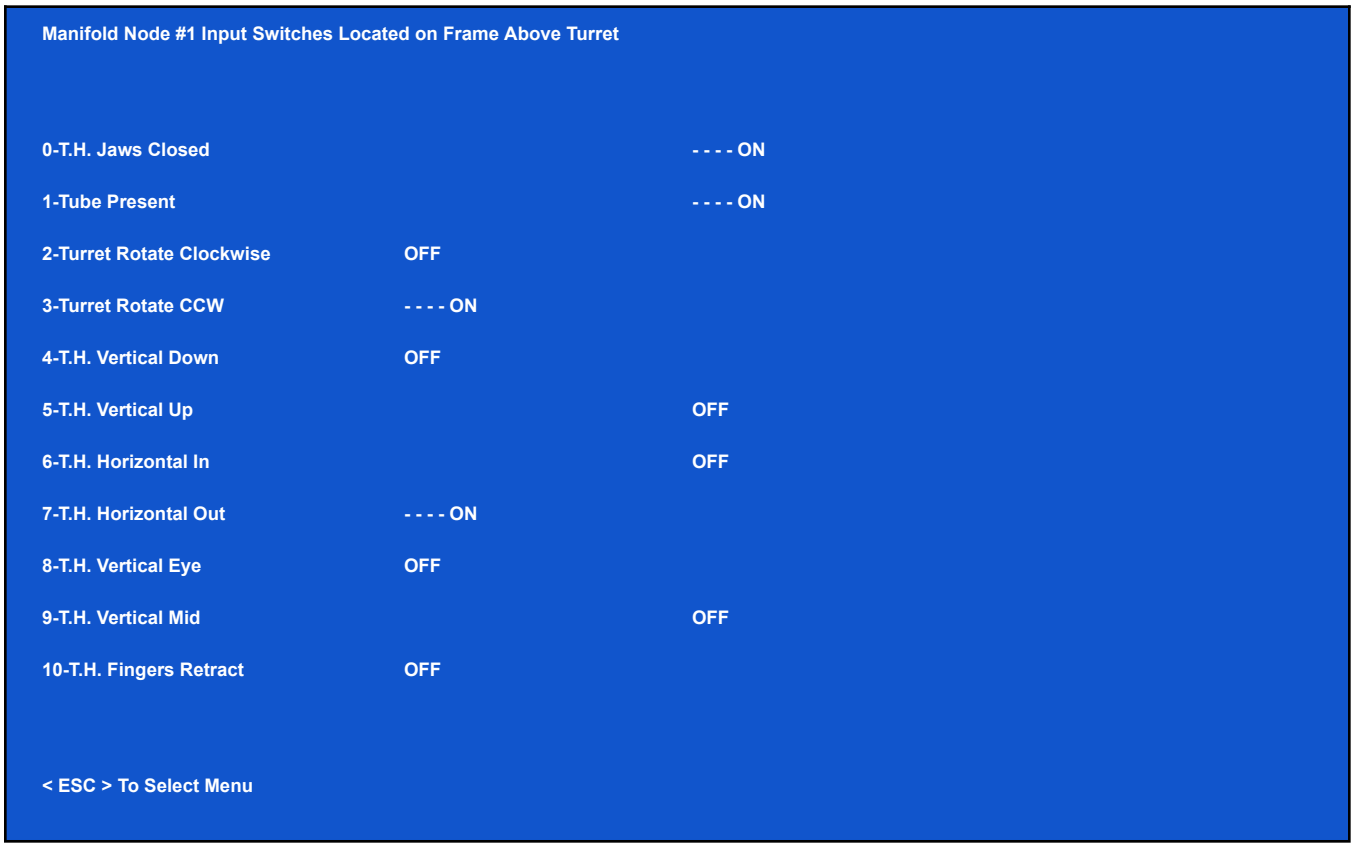
To change the status of a particular input device, move a part manually or by outputting to the appropriate output device.

Function 6 – Input Nodes

Press number 6 and the following screen will appear:



Check any of the nodes to see what switch is on. Press the number 1-7 on the keyboard/pad to see the following inputs. They will be off or on. Move the appropriate parts on the D-2000 to change state of the switch. Press “ESC” to exit.




Manifold node #2 Switches Winding Side Spindle Table
0-Spindle Table Out OFF
1-Spindle Table In - - - - ON
2-Sp Index Unlocked - - - - ON
3-Sp Index Locked OFF
4-Sp Mandrel Collapsed - - - - ON
5-Sp Mandrel Expanded OFF
6-Sp Gear Motor Disengaged - - - - ON
7-Sp Gear Motor Engaged - - - - ON
8-C.G. Horizontal Mid OFF
< ESC > To Select Menu

Manifold node #3 Switches on Turret

0-RT Mandrel Collapsed	OFF
1-LT Mandrel Collapsed	- - - - ON
2-RT Gear Motor Engaged	- - - - ON
3-LT Gear Motor Engaged	OFF
4-RT Mandrel Mid	- - - - ON
5-LT Mandrel Mid	OFF
6-RT Gear motor Disengaged	- - - - ON
7-LT Gear motor Disengaged	- - - - ON
8-RT Mandrel Expanded	OFF
9-LT Mandrel Expanded	- - - - ON
10-RT Endform Up	OFF
11-LT Endform Up	- - - - ON
12-RT Endform Mid	OFF
13-LT Endform Mid	- - - - ON
14-RT Endform Down	- - - - ON
15-LT Endform Down	OFF

< ESC > To Select Menu

Manifold node #4 Switches Cut Grab Table

A0-Cut Grab Vertical Down	OFF
A1-Cut Grab Horizontal Left	- - - - ON
A2-Not Used	OFF
A3-C.G. Horizontal Mid	- - - - ON
B0-Cut Grab Horizontal Right	OFF
B1-Cut Grab Table In	OFF
B2-Cut Grab Table Out	- - - - ON
B3-Cut Grab Vertical Up	- - - - ON

< ESC > To Select Menu

Manifold node #5 Switches Top of Box Side Frame

A0-Glue Gun Photo			- - - - ON
A1-Glue Nozzle Down		- - - - ON	
A2-Glue Flaps Up			OFF
A3-Glue Flaps Mid		- - - - ON	
B0-Box Load Vacuum	OFF		
B1-Box Load Vertical Up	OFF		
B2-Box Load Horizontal Out	- - - - ON		
B3-Box Load Horizontal In	OFF		
C0-Low box Supply		OFF	
C1-Box Exit		- - - - ON	
C2-Conveyor Full			OFF
C3-Low Tube Supply	- - - - ON		
D0-Tube Pickup Cup		OFF	
D1-Box Table Mid		OFF	
D2-Box Table End Reset	- - - - ON		
D3-Not Used		- - - - ON	

< ESC > To Select Menu

Manifold node #6 Switches Box Table

A0-Box fold Right Extend OFF

A1-Box fold Left Extend ----------ON

A2-WireEnd assm Out OFF

A3-Box Top Fold Photo Eye ----------ON

B0-Compress Open OFF

B1-BottomFlap Left Down OFF

B2-Unused OFF

B3-BottomFlap Left Up ----------ON

C0-Compress closed ----------ON

C1-BottomFlap Right Down OFF

C2-Table Vacuum ----------ON

C3-BottomFlap Right Up OFF

< ESC > to Select Menu

I/O Module node #7 Switches Button Box

Module A

Ix0-Start Button OFF

Ix1-Stop Button ----------ON

Ix2-Speed Slowdown OFF

Ix3-Speed up ----------ON

Ix4-Continue Button OFF

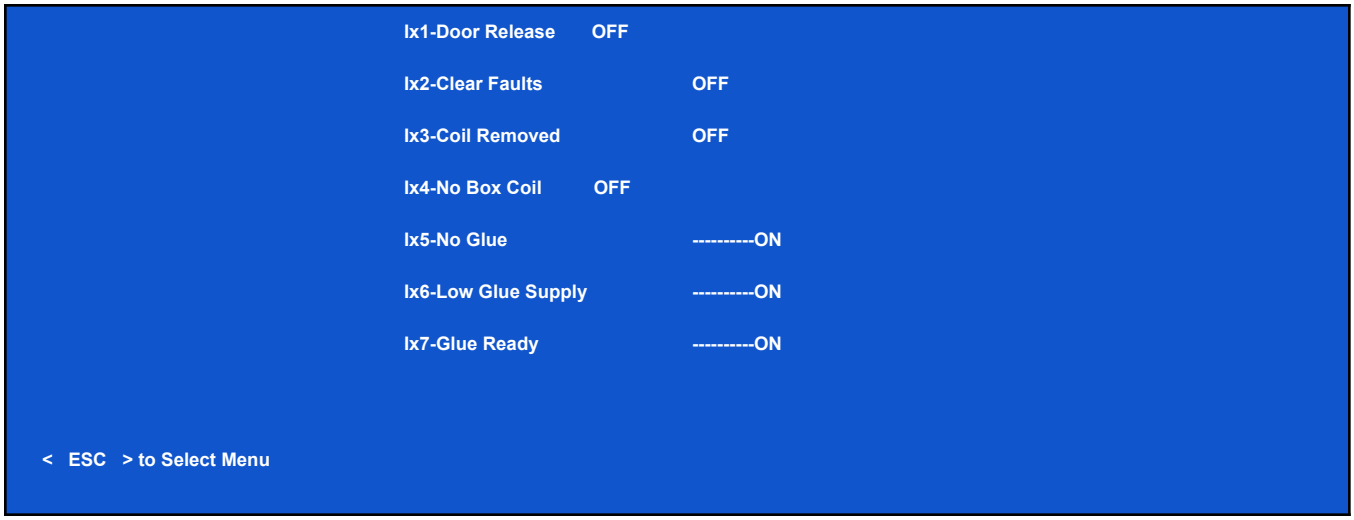
Ix5-Pause Button OFF

Ix6-Length Reset OFF

Ix7-Transfer ----------ON

Module B

Ix0-SeQ Window OFF

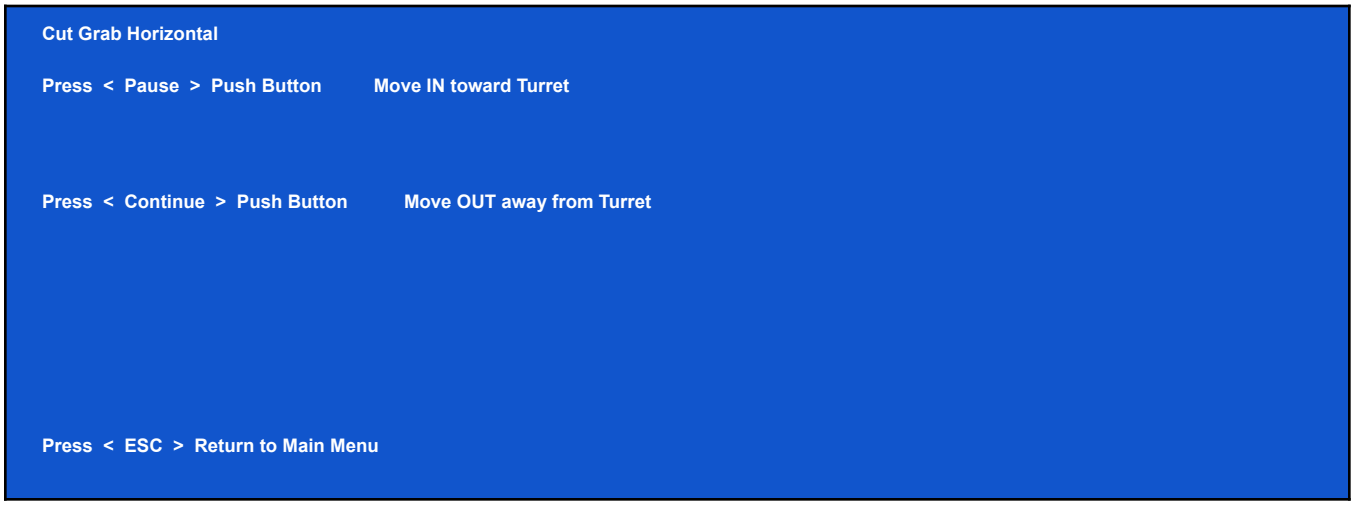

Ix1-Door Release OFF
Ix2-Clear Faults OFF
Ix3-Coil Removed OFF
Ix4-No Box Coil OFF
Ix5-No Glue ----------ON
Ix6-Low Glue Supply ----------ON
Ix7-Glue Ready ----------ON
< ESC > to Select Menu

Function 7 – Output Nodes

Press number 7. The following screen will appear:

Press the node needed. A new menu will come up.

Select which value (1-7) is needed. Another screen will appear. Turn the valve on. It also indicates which direction it will go.



This can be done for all the rest of the output nodes.

Manifold node #3 On Turret

1-Tailhold Left

2-Tailhold Right

3-Gearmotor Right side

4-Gearmotor Left side

5-Endform Left

6-Endform Right

7-Tube Inserter Stop Cyc

8-Not used

< ESC > to Select Menu

Manifold node #4 Cut Grab

1-Cut Grab Cut

2-Cut Grab Cut

3-C.G Vertical

4-C.G Horizontal

< ESC > to Select Menu

Manifold node #5 SMC Top of Boxside

1-Glue Gun

2-Glue Flap Vertical

3-Boxload Vacuum

4-Boxload 2nd CUP

5-Glue Nozzle Vertical

6-Boxload Vertical

7-Boxload Horizontal

< ESC > to Select Menu

Manifold node #6 SMC Box Table

1-Box Fold Bottom Left

2-Box Fold Bottom Right

3-B.F Back Right

4-B.F Front

5-Wire Grabber Assm or Nylon Rod & Switch

6-Table Vacuum Unlatch Box Fold Compress

7-Wire Grab Around

8-Table Vacuum Top Flap Start

9-1st Top Flap Nylon

0-Box Flap Left

A-Vac Cup Purge

< ESC > to Select Menu

I/0 Modual node #7 Button Box

1-Start Light

2-Continue Light

3-Box Side Slow Start dump

4-Hotmelt Standby Reset Signal

5-Door Release Light

6-No Box Light

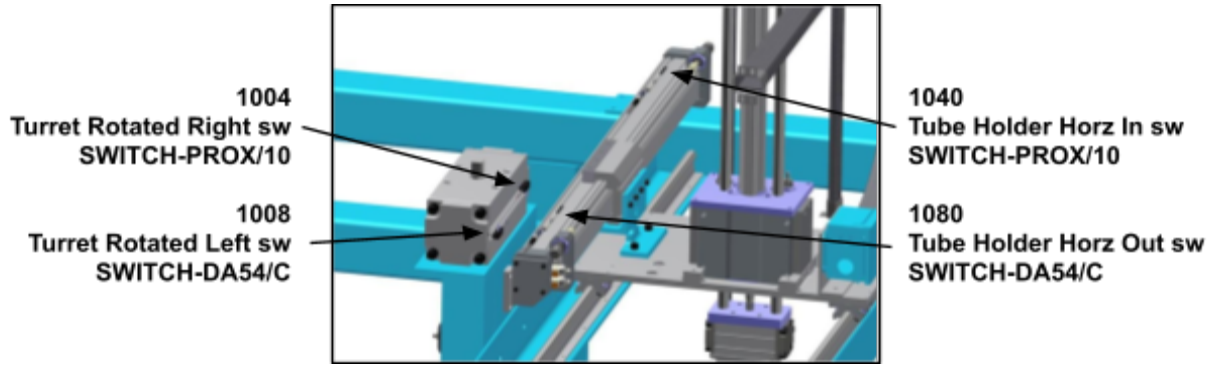
7-No Glue Top Light

< ESC > to Select Menu

Devicenet Switch Locations

Node 1

Figure 4- Turret Rotary Actuator, Tube Holder Horizontal Cylinder



NOTE: The Left Turret's "L" Bracket will move under the traverse while in motion. The right side will never, the machine will reset and always start on the right turret

Figure 9- Tube Holder, Tube Holder Vertical Eye

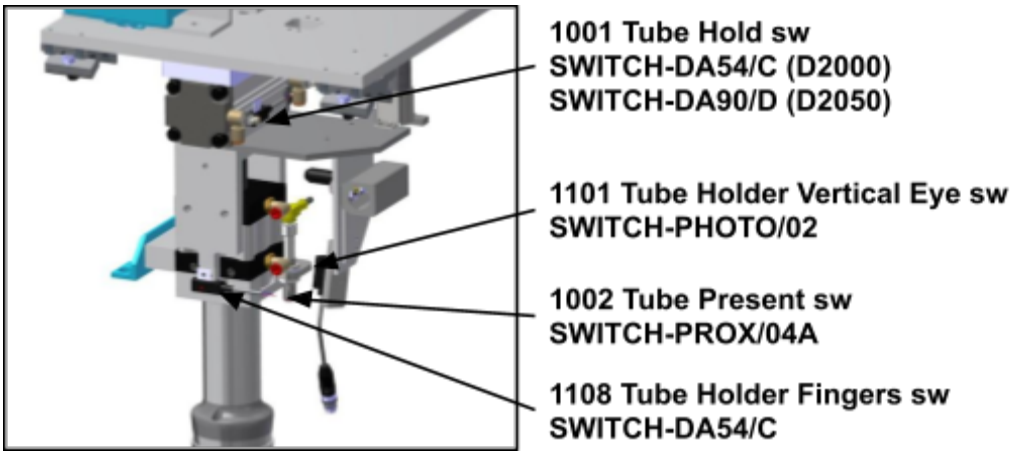
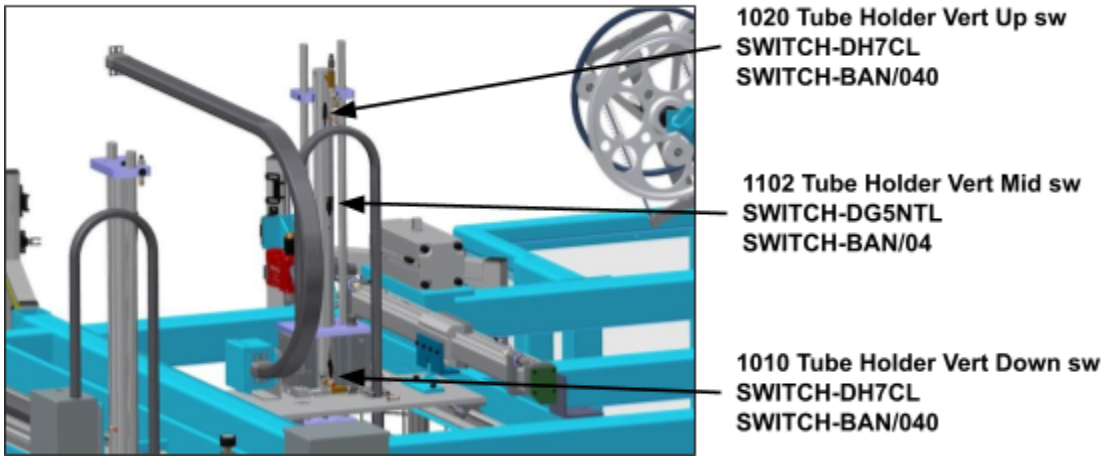


Figure 10 - Tube Holder Vertical Cylinder



Node 2

Figure 1 - Spindle Table

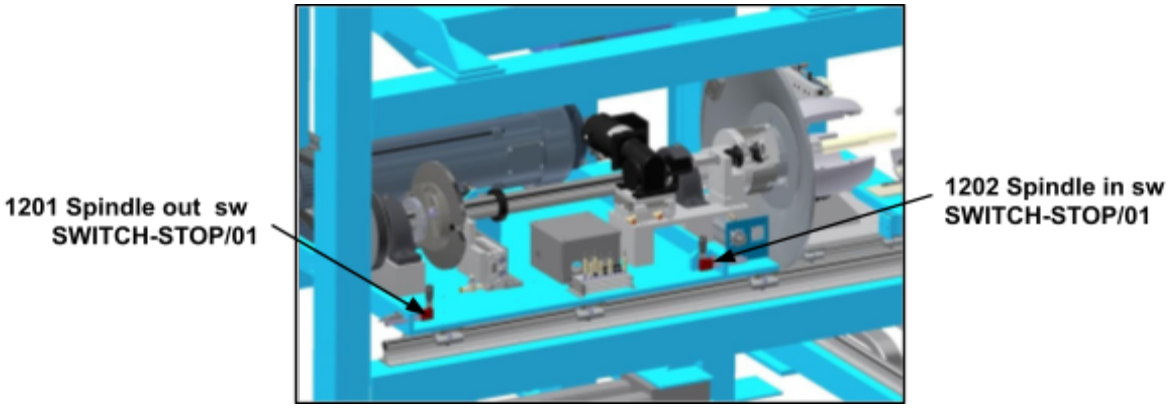


Figure 7 - Spindle Mandrel

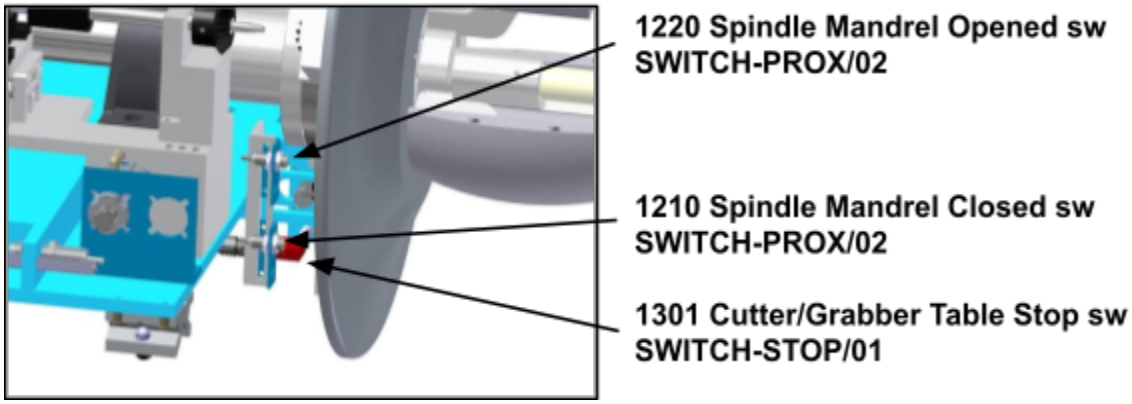
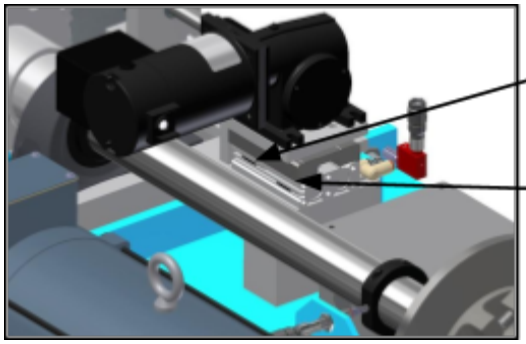
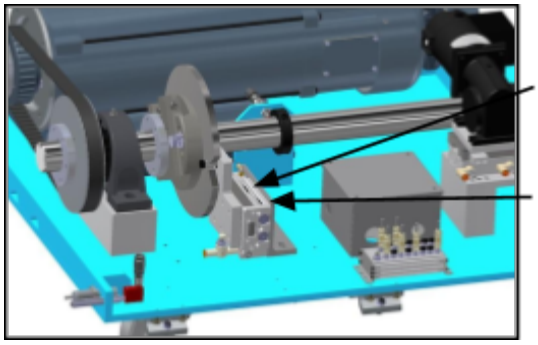


Figure 8 - Spindle Index, Spindle Gear Motor Engage/Disengage



1280 Spindle Gearmotor Engaged sw
SWITCH-DA90/C

1240 Spindle Gearmotor Disengaged sw
SWITCH-DA90/C



1208 Spindle Index Locked sw
SWITCH-DA90/C

1204 Spindle Index Unlocked sw
SWITCH-DA90/C

Node 3

Figure 2 - Endform/Turret Rotation

Rotation Stop for
Right Side
Winding

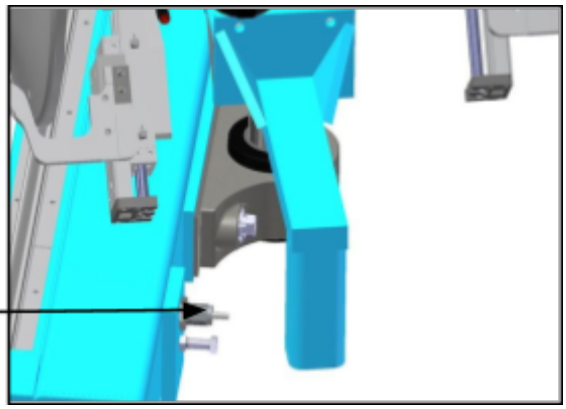
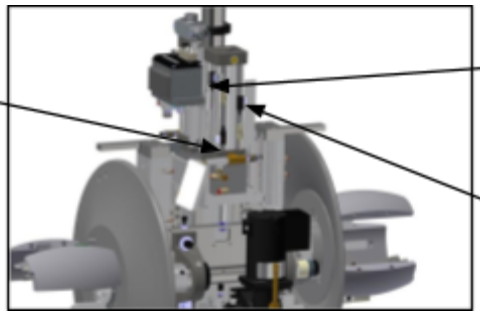


Figure 3 - Endform Cylinder

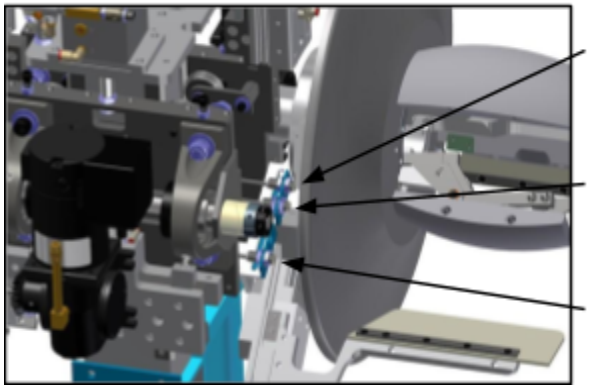
1580 Left Enform Down sw
1540 Right Endform Down sw
SWITCH-DA54/C(D2000)
SWITCH-DA54 (D2050)



1508 Left Endform Up sw
1504 Right Endform Up sw
SWITCH-D54/C (D2000)
SWITCH-D54 (D2050)

1520 Left Endform Mid sw
1510 Right Endform Mid sw
SWITCH-DA54

Figure 5 - Mandrel

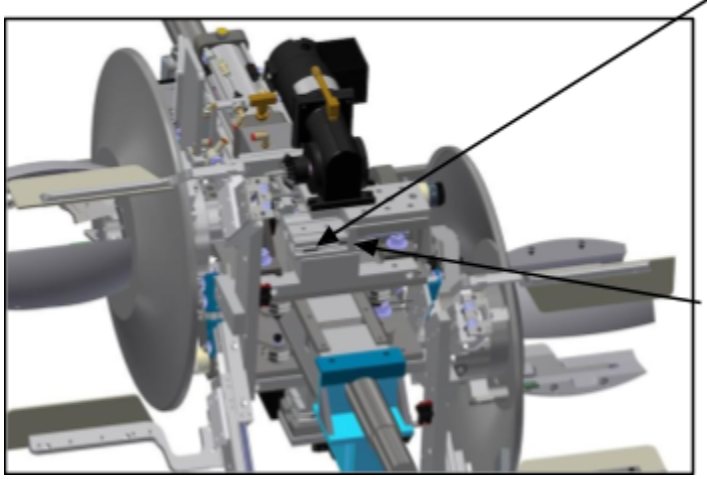


1502 Left Mandrel Opened sw
1501 Right Mandrel Opened sw
SWITCH-PROX/02

1420 Left Mandrel Mid sw
1410 Right Mandrel Mid sw
SWITCH-PROX/02

1402 Left Mandrel Closed sw
1401 Right Mandrel Closed sw
SWITCH-PROX/02

Figure 6 - Turret Gearmotor Engage/Disengage

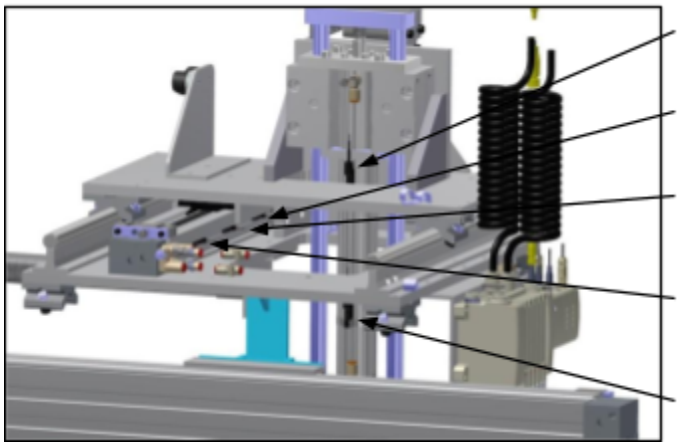


1408 Left Gear Motor Engaged sw
1404 Right Gear Motor Engaged sw
SWITCH-DA90/D

1480 Left Gear Motor Disengaged sw
1440 Right Gear Motor Disengaged sw
SWITCH-DA90/D

Node 4

Figure 12 - Cutter/Grabber L/R/Mid, Vertical Up/Down (D-2000 Only)



1680 Cutter/Grabber Vert Up sw
SWITCH-DH7CL

1602 Cutter/Grabber Horz Left sw
SWITCH-DY69BL/D

1608 Cutter/Grabber Left-Right Mid sw
SWITCH-DY69BL/D
(See DWG. 18036 SWITCH-LATCH/K1)

1610 Cutter/Grabber Horz Right sw
SWITCH-DY69BL/D

1601 Cutter/Grabber Vert Down sw
SWITCH-DH7CL
SWITCH-BAN/040

Figure 13 - Cutter/Grabber Horizontal In/Out (D-2000 Only)

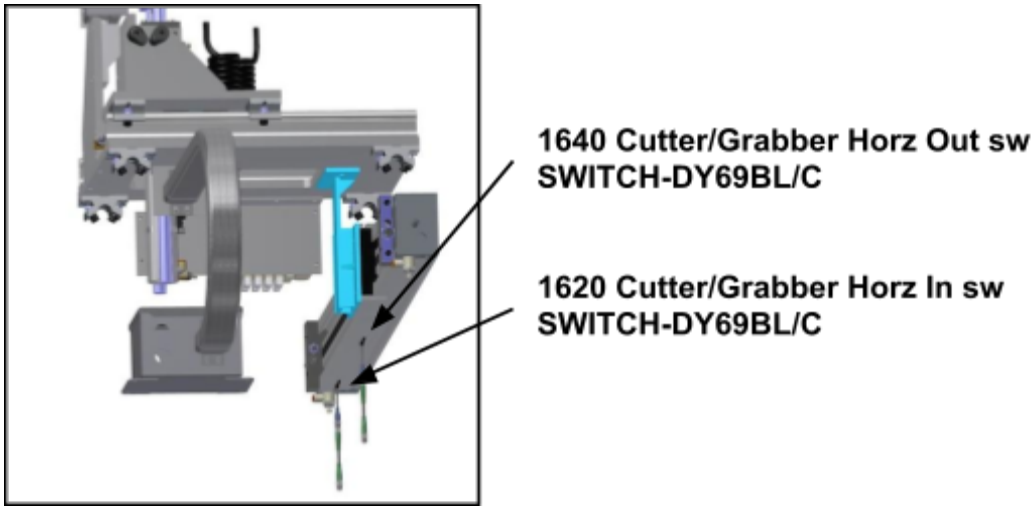


Figure 23 - Robot Arm (D-2050 Only)

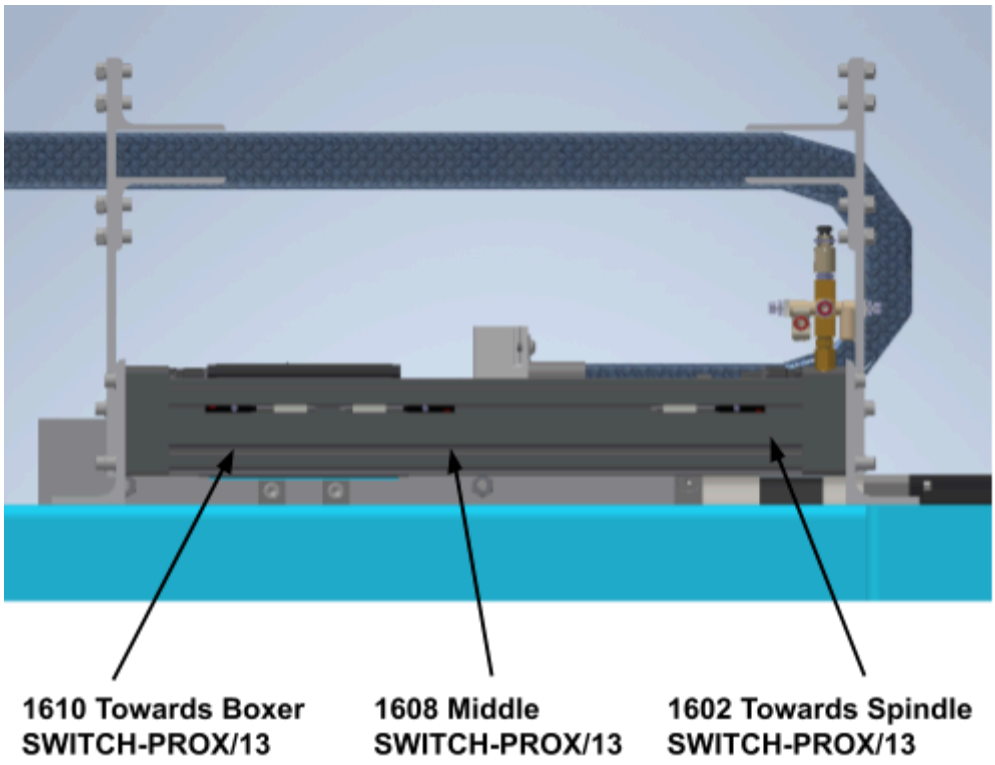
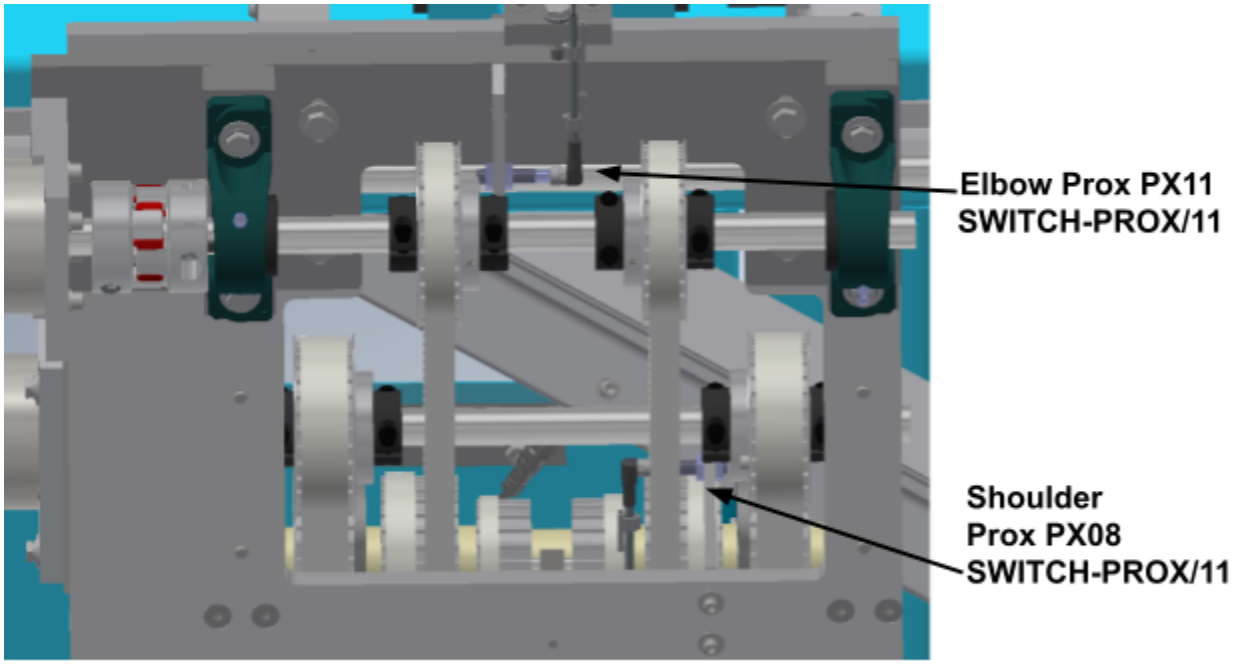


Figure 24 - Robot Arm Shoulder/Elbow (D-2050 Only)



Node 5

Figure 14 - Box Load Horizontal Cylinder

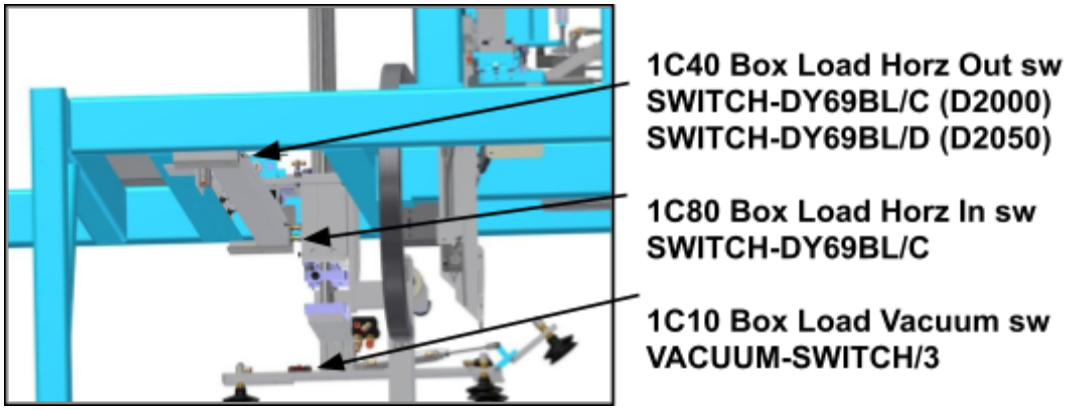


Figure 15 - Box Load Vertical Cylinder

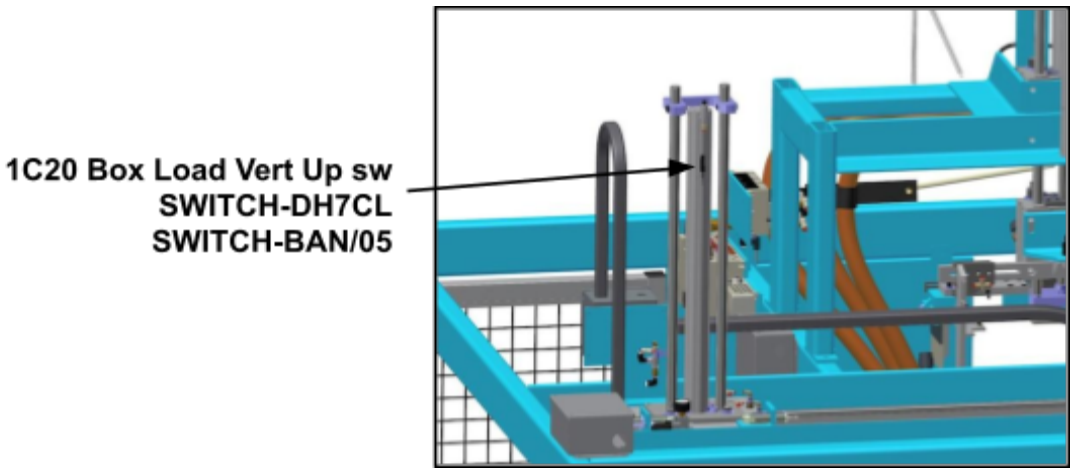
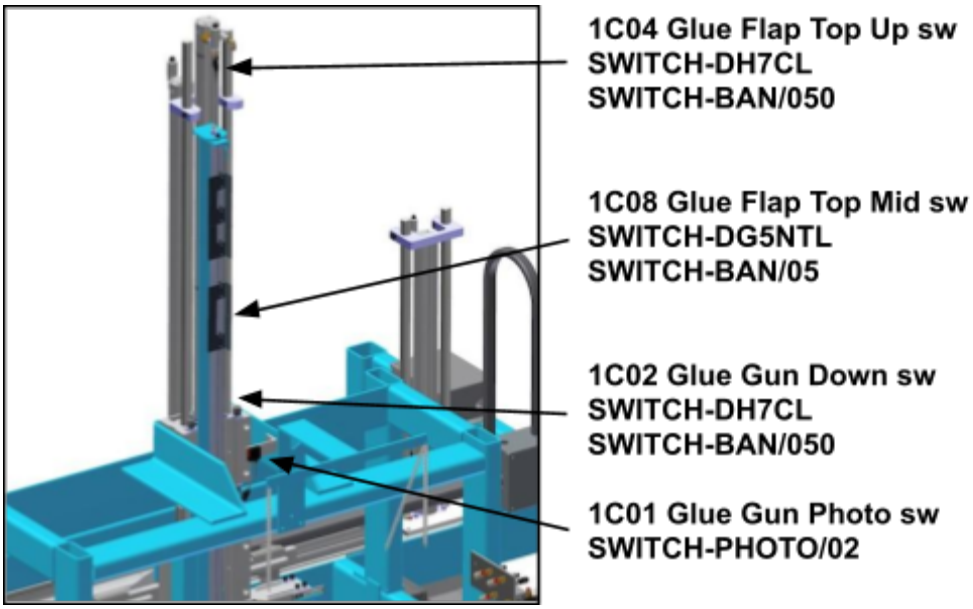
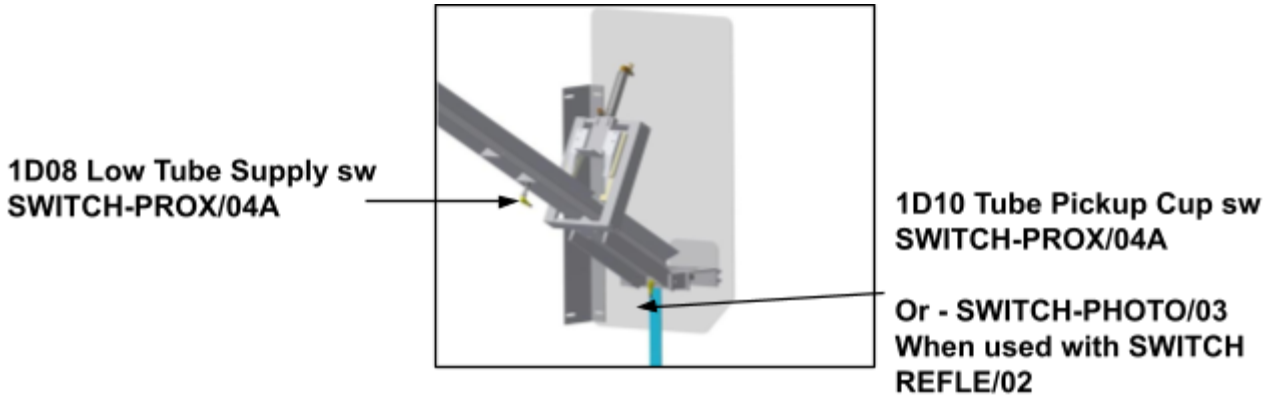


Figure 16 - Box Fold Top/Glue Nozzles



Node 5

Figure 11 - Tube Pickup Cup



Node 6

Figure 18 - Box Fold Back/Table Box Hold Vacuum Switch

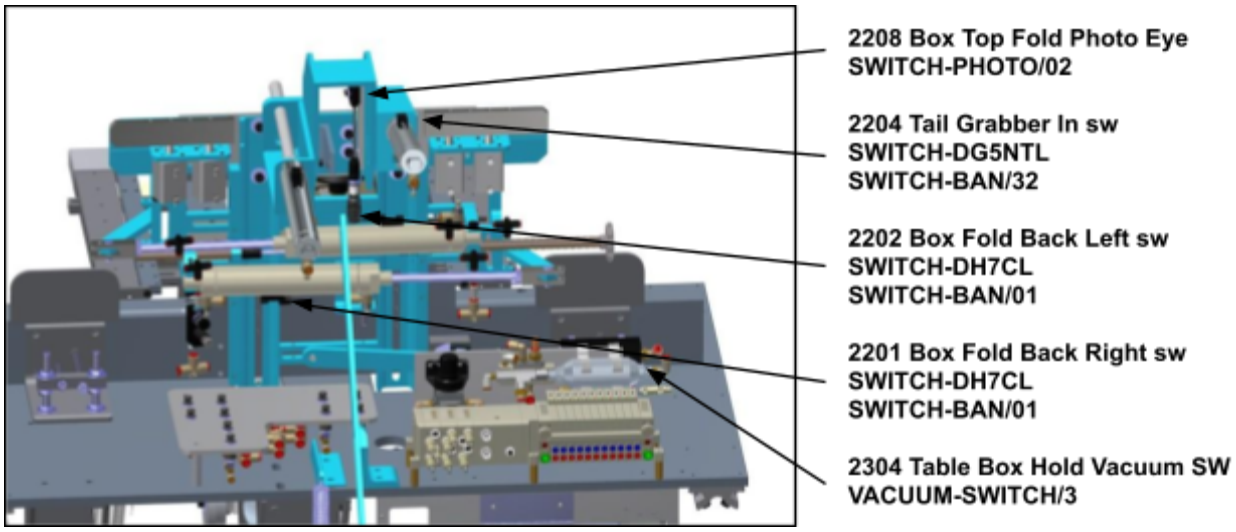


Figure 19 - Box Fold Bottom

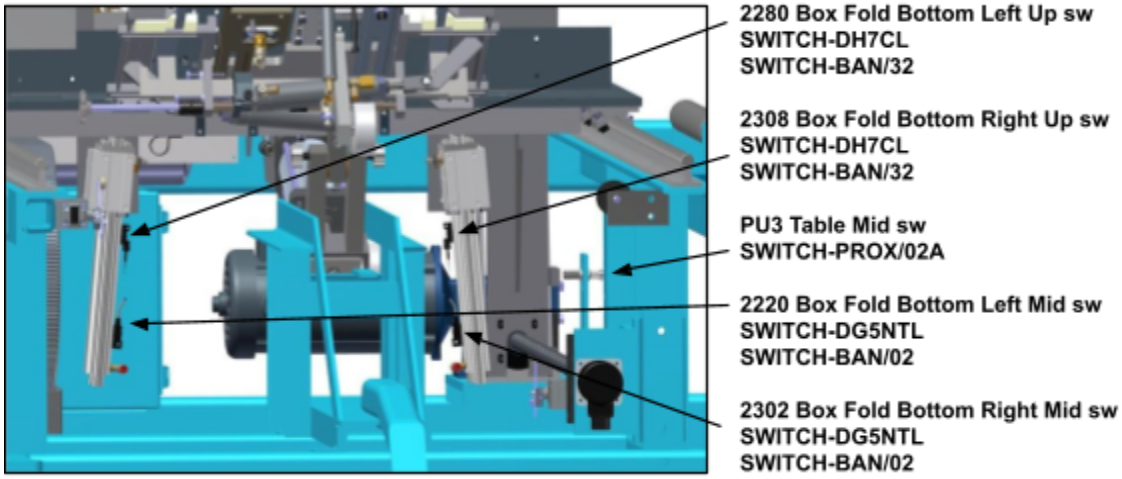


Figure 21 - Compression Cylinder

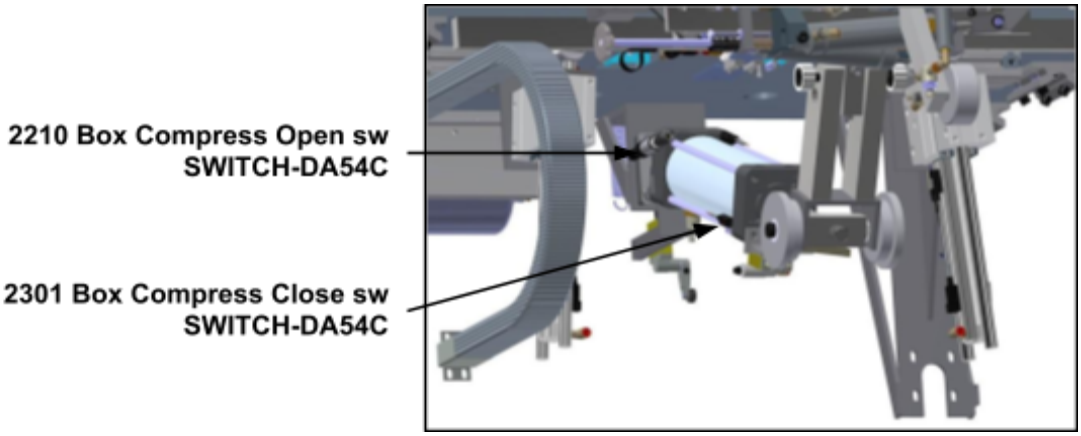


Figure 22 - Conveyor