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Introduction

The Purpose of this document is to give additional information for the instructional videos. Please click on the Table of Content to jump to the desired information.

G Code List

G code list						Group	Function	Section
2	3	4	5	6	7			
ΔG00	ΔG00	ΔG00	ΔG00	ΔG00	ΔG00	01	Positioning	6.1
ΔG01	ΔG01	ΔG01	ΔG01	ΔG01	ΔG01	01	Linear interpolation	6.2
G02	G02	G02	G02	G02	G02	01	Circular interpolation CW / Helical interpolation CW	6.3 6.4 6.7
G03	G03	G03	G03	G03	G03	01	Circular interpolation CCW / Helical interpolation CCW	6.3 6.4 6.7
G02.3	G02.3	G02.3	G02.3	G02.3	G02.3	01	Exponential interpolation CW	6.11
G03.3	G03.3	G03.3	G03.3	G03.3	G03.3	01	Exponential interpolation CCW	6.11
G04	G04	G04	G04	G04	G04	00	Dwell	8.1
				G07.1 G107	G07.1 G107	19	Cylindrical interpolation	6.9
G09	G09	G09	G09	G09	G09	00	Exact stop check	7.10
G10	G10	G10	G10	G10	G10	00	Parameter/Compensation data input by program/ Tool life management data registration	12.5 13.15
G11	G11	G11	G11	G11	G11	00	Program parameter input / Tool life management data registration mode cancel	12.5 13.15
				G12.1 G112	G12.1 G112	19	Polar coordinate interpolation ON	6.10
				G13.1 G113	G13.1 G113	19	Polar coordinate interpolation cancel	6.10
G12.1	G12.1	G12.1	G12.1			19	Milling interpolation ON	6.8
*G13.1	*G13.1	*G13.1	*G13.1			19	Milling interpolation cancel	6.8
*G14	*G14	*G14	*G14			18	• Balance cut OFF	13.18
G15	G15	G15	G15			18	• Balance cut ON	13.18

G code list						Group	Function	Section
2	3	4	5	6	7			
G16	G16	G16	G16			02	Milling interpolation plane selection Y-Z cylindrical plane	6.8.3
ΔG17	ΔG17	ΔG17	ΔG17	ΔG17	ΔG17	02	Plane selection X-Y	6.5
ΔG18	ΔG18	ΔG18	ΔG18	ΔG18	ΔG18	02	Plane selection Z-X	6.5
ΔG19	ΔG19	ΔG19	ΔG19	ΔG19	ΔG19	02	Plane selection Y-Z	6.5
ΔG20	ΔG20	ΔG20	ΔG20	ΔG20	ΔG20	06	Inch command	5.3
ΔG21	ΔG21	ΔG21	ΔG21	ΔG21	ΔG21	06	Metric command	5.3
G22	G22	G22	G22			04	Barrier check ON	15.1
*G23	*G23	*G23	*G23			04	Barrier check OFF	15.1
				G22	G22	00	Soft limit ON	15.2
				G23	G23	00	Soft limit OFF	15.2
G27	G27	G27	G27	G27	G27	00	Reference position return check	14.9
G28	G28	G28	G28	G28	G28	00	Automatic reference position return	14.7
G29	G29	G29	G29	G29	G29	00	Return from reference position	14.7
G30	G30	G30	G30	G30	G30	00	2nd, 3rd and 4th reference position return	14.8
G30.1	G30.1	G30.1	G30.1	G30.1	G30.1	00	Tool change position return 1	13.17
G30.2	G30.2	G30.2	G30.2			00	Tool change position return 2	13.17
G30.3	G30.3	G30.3	G30.3			00	Tool change position return 3	13.17
G30.4	G30.4	G30.4	G30.4			00	Tool change position return 4	13.17
G30.5	G30.5	G30.5	G30.5			00	Tool change position return 5	13.17
G31	G31	G31	G31	G31	G31	00	Skip function/Multiple-step skip function 2	16.2 16.4
G31.1	G31.1	G31.1	G31.1	G31.1	G31.1	00	Multiple-step skip function 1-1	16.3
G31.2	G31.2	G31.2	G31.2	G31.2	G31.2	00	Multiple-step skip function 1-2	16.3
G31.3	G31.3	G31.3	G31.3	G31.3	G31.3	00	Multiple-step skip function 1-3	16.3
G32	G33	G32	G33	G32	G33	01	Thread cutting	6.6.1 6.6.2
G34	G34	G34	G34	G34	G34	01	Variable lead thread cutting	6.6.4
G35	G35	G35	G35	G35	G35	01	Circular thread cutting CW	6.6.5
G36	G36	G36	G36	G36	G36	01	Circular thread cutting CCW	6.6.5
G37	G37	G36/G37	G36/G37	G36/G37 G37.1 G37.2	G36/G37 G37.1 G37.2	00	Automatic tool length measurement	16.1
*G40	*G40	*G40	*G40	*G40	*G40	07	Tool nose R compensation cancel	12.4
G41	G41	G41	G41	G41	G41	07	Tool nose R compensation left	12.4
G42	G42	G42	G42	G42	G42	07	Tool nose R compensation right	12.4
G46	G46	G46	G46	G46	G46	07	Tool nose R compensation (direction automatically selected) ON	12.4

G code list						Group	Function	Section
2	3	4	5	6	7			
G43.1	G43.1	G43.1	G43.1	G43.1	G43.1	20	1st spindle control mode	10.12.2
G44.1	G44.1	G44.1	G44.1	G44.1	G44.1	20	Selected spindle control mode	10.12.2
G47.1	G47.1	G47.1	G47.1	G47.1	G47.1	20	All spindles simultaneous control mode	10.12.2
G50	G92	G50	G92	G50	G92	00	Spindle clamp speed setting	10.5
							Coordinate system setting	14.6
*G50.2	*G50.2	*G50.2	*G50.2			11	Scaling cancel	
G51.2	G51.2	G51.2	G51.2			11	Scaling ON	
				G50.2	G50.2	00	Polygon machining mode cancel (spindle-tool axis synchronization)	10.9
				G51.2	G51.2	00	Polygon machining mode ON (spindle-tool axis synchronization)	10.9
				G250	G250			
				G251	G251			
G52	G52	G52	G52	G52	G52	00	Local coordinate system setting	14.11
G53	G53	G53	G53	G53	G53	00	Basic machine coordinate system selection	14.5
*G54	*G54	*G54	*G54	*G54	*G54	12	Workpiece coordinate system selection 1	14.10
G55	G55	G55	G55	G55	G55	12	Workpiece coordinate system selection 2	14.10
G56	G56	G56	G56	G56	G56	12	Workpiece coordinate system selection 3	14.10
G57	G57	G57	G57	G57	G57	12	Workpiece coordinate system selection 4	14.10
G58	G58	G58	G58	G58	G58	12	Workpiece coordinate system selection 5	14.10
G59	G59	G59	G59	G59	G59	12	Workpiece coordinate system selection 6	14.10
G54.1	G54.1	G54.1	G54.1	G54.1	G54.1	12	Workpiece coordinate system 48 sets expanded	14.10
G61	G61	G61	G61	G61	G61	13	Exact stop check mode	7.11
G62	G62	G62	G62	G62	G62	13	Automatic corner override	7.13
G63	G63	G63	G63	G63	G63	13/19	Tapping mode	7.14
*G64	*G64	*G64	*G64	*G64	*G64	13/19	Cutting mode	7.15
G65	G65	G65	G65	G65	G65	00	User macro call	13.9.1
G66	G66	G66	G66	G66	G66	14	User macro modal call A	13.9.1
G66.1	G66.1	G66.1	G66.1	G66.1	G66.1	14	User macro modal call B	13.9.1
*G67	*G67	*G67	*G67	*G67	*G67	14	User macro modal call cancel	13.9.1
G68	G68	G68	G68			15	Mirror image for facing tool posts ON	13.10
G69	G69	G69	G69			15	Mirror image for facing tool posts OFF	13.10
				G68	G68	15	Mirror image for facing tool posts ON or balance cut mode ON	13.10
				*G69	*G69	15	Mirror image for facing tool posts OFF or balance cut mode cancel	13.10
G70	G70	G70	G70	G70	G70	09	Finishing cycle	13.3.4
G71	G71	G71	G71	G71	G71	09	Longitudinal rough cutting cycle	13.3.1
G72	G72	G72	G72	G72	G72	09	Face rough cutting cycle	13.3.2
G73	G73	G73	G73	G73	G73	09	Formed material rough cutting cycle	13.3.3
G74	G74	G74	G74	G74	G74	09	Face cut-off cycle	13.3.5
G75	G75	G75	G75	G75	G75	09	Longitudinal cut-off cycle	13.3.6
G76	G76	G76	G76	G76	G76	09	Compound thread cutting cycle	13.3.7

G code list						Group	Function	Section
2	3	4	5	6	7			
G76.1	G76.1	G76.1	G76.1	G76.1	G76.1	09	• 2-part system synchronous thread-cutting cycle (1)	13.20.2
G76.2	G76.2	G76.2	G76.2	G76.2	G76.2	09	• 2-part system synchronous thread-cutting cycle (2)	13.20.3
G90	G77	G90	G77	G90	G77	09	Longitudinal cutting fixed cycle	13.1.1
G92	G78	G92	G78	G92	G78	09	Thread cutting fixed cycle	13.1.2
G94	G79	G94	G79	G94	G79	09	Face cutting fixed cycle	13.1.3
*G80	*G80	*G80	*G80	*G80	*G80	09	Fixed cycle for drilling cancel	13.5 13.5.5 13.6
G81	G81	G81	G81	G81	G81	09	Fixed cycle (drill/spot drilling)	13.6
G82	G82	G82	G82	G82	G82	09	Fixed cycle (drill/counter boring)	13.6
G79	G83.2	G79	G83.2	G79	G83.2	09	Deep hole drilling cycle 2	13.5.4
G83	G83	G83	G83	G83	G83	09	Deep hole drilling cycle (Z axis)/ Small-diameter deep-hole drilling cycle	13.5 13.5.1
G83.1	G83.1	G83.1	G83.1	G83.1	G83.1	09	Stepping cycle	13.6
G84	G84	G84	G84	G84	G84	09	Tapping cycle (Z axis)	13.5 13.5.2
G85	G85	G85	G85	G85	G85	09	Boring cycle (Z axis)	13.5 13.5.3
G87	G87	G87	G87	G87	G87	09	Deep hole drilling cycle (X axis)	13.5 13.5.1
G88	G88	G88	G88	G88	G88	09	Tapping cycle (X axis)	13.5 13.5.2
G89	G89	G89	G89	G89	G89	09	Boring cycle (X axis)	13.5 13.5.3
G84.1	G84.1	G84.1	G84.1	G84.1	G84.1	09	Reverse tapping cycle (Z axis)	13.5.2
G84.2	G84.2	G84.2	G84.2	G84.2	G84.2	09	Synchronous tapping cycle	13.6
G88.1	G88.1	G88.1	G88.1	G88.1	G88.1	09	Reverse tapping cycle (X axis)	13.5.2
G50.3	G92.1	G50.3	G92.1	G50.3	G92.1	00	Workpiece coordinate preset	14.12
ΔG96	ΔG96	ΔG96	ΔG96	ΔG96	ΔG96	17	Constant surface speed control ON	10.4
ΔG97	ΔG97	ΔG97	ΔG97	ΔG97	ΔG97	17	Constant surface speed control OFF	10.4
ΔG98	ΔG94	ΔG98	ΔG94	ΔG98	ΔG94	05	Feed per minute (Asynchronous feed)	7.4
ΔG99	ΔG95	ΔG99	ΔG95	ΔG99	ΔG95	05	Feed per revolution (Synchronous feed)	7.4
–	ΔG90	–	ΔG90	–	ΔG90	03	Absolute value command	5.1
–	ΔG91	–	ΔG91	–	ΔG91	03	Incremental value command	5.1
–	*G98	–	*G98	–	*G98	10	Fixed cycle initial return	13.6 13.6.1
–	G99	–	G99	–	G99	10	Fixed cycle R point return	13.6.1

G code list						Group	Function	Section
2	3	4	5	6	7			
G113	G113	G113	G113			00	Spindle synchronization cancel Polygon machining (spindle-spindle synchronization) mode cancel	10.7 10.8
G114.1	G114.1	G114.1	G114.1			00	Spindle synchronization	10.7.1
G114.2	G114.2	G114.2	G114.2			00	Polygon machining (spindle-spindle synchronization) mode ON	10.8
G114.3	G114.3	G114.3	G114.3			00	Tool spindle synchronization II (Hobbing)	10.11
G115	G115	G115	G115	G115	G115	00	• Start point designation synchronization Type 1	13.19.2
G116	G116	G116	G116	G116	G116	00	• Start point designation synchronization Type 2	13.19.3
G117	G117	G117	G117	G117	G117	00	• Miscellaneous function output during axis movement	

M Code List

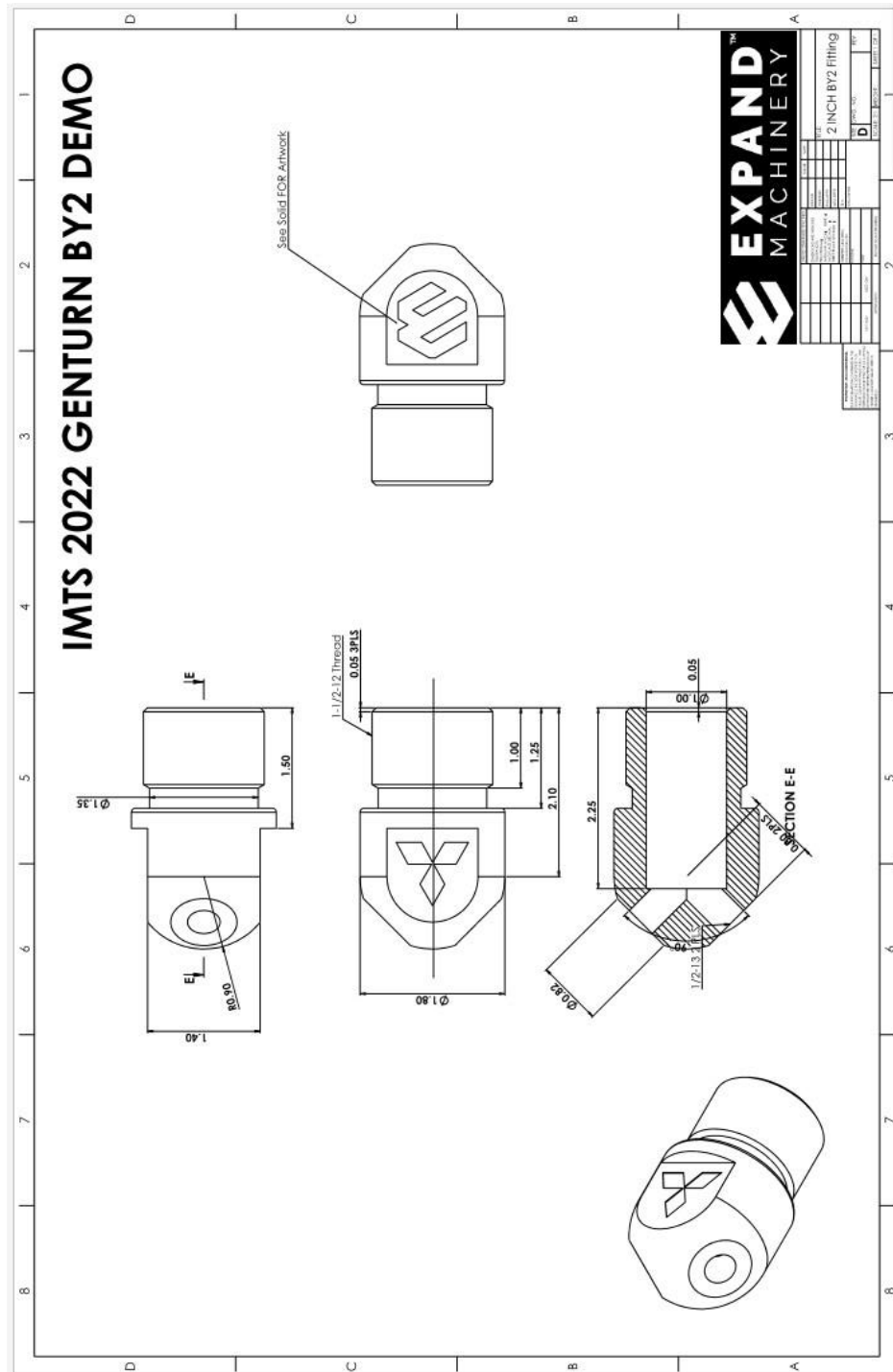
Spindle \$1	Sub Spindle \$2	Description
M00		Program stop
M01		Optional stop
M02		End of program
M03	M203	Spindle forward
M04	M204	Spindle reverse
M05	M205	Spindle stop
M08	M208	Coolant ON
M09	M209	Coolant OFF
M10	M210	Chuck clamp
M 11	M 2 11	Chuck unclamp
M13	M213	Spindle forward &Coolant ON
M14	M214	Spindle reverse &Coolant ON
M15	M215	Spindle stop &Coolant OFF
M19	M219	Spindle orientation
M27		B1 axis Brake
M28		B1 axis Brake release
M30		Program End & Rewind
M31	M231	Increase Spindle rpm limit to 500 when chuck open
M32	M232	Spindle rpm limit increase Canceled when chuck open
M34		Parts Catcher Forward
M35		Parts Catcher Backward
M36	M236	Spindle Air Blow ON
M37	M237	Spindle Air Blow OFF

Spindle \$1	Sub Spindle \$2	Description
M38	M238	Spindle Internal Coolant ON
M39	M239	Spindle Internal Coolant OFF
M43	M243	B1/B2 Live Tooling CW
M44	M244	B1/B2 Live Tooling CCW
M45	M245	B1/B2 Live Tooling Stop
M46	M246	B1/B2 Live Tooling Orientation
M47 (Call O9020)		High Pressure Coolant ON
M48	M248	Y1/Y2 Coolant ON
M49	M249	Y1/Y2 Coolant OFF
M50	M250	Spindle C Axis On
M51	M251	Spindle C Axis OFF
M53	M253	Spindle C Axis Brake ON 100%
M54	M254	Spindle C Axis Brake OFF
M57	M257	Spindle Air Blow ON
M58	M258	Spindle Air Blow OFF
M259		Part ejector Forward
M260		Part ejector Backward
M70		Chuck Open Allow When Spindle Synchronization ON
M71		Chuck Open Allow When Spindle Synchronization OFF
M72		Base and Synchronization Spindle Clamp Same parts ON
M73		Base and Synchronization Spindle Clamp Same parts OFF
M74		Spindle Synchronization Error Offset Dwell ON
M75		Spindle Synchronization Error Offset Dwell OFF

Spindle \$1	Sub Spindle \$2	Description
M76		Spindle Synchronization Check Ready
M77		Ignore Spindle Synchronization Finish Signal Available
M78		Spindle Speed Synchronization Finish Check
M79		Spindle Phrase Synchronization Finish Check
M80		Bar Feeder Auto ON
M81		Bar Feeder Auto OFF
M82		Bar Feeder Feeding Allow ON
M83		Bar Feeder Feeding Allow OFF
M84		Bar Feeder Back Allow ON
M85		Bar Feeder Back Allow OFF
M86		Wait Bar Feeder Change Bar ON
M87		Wait Bar Feeder Change Bar OFF
M89		Work Parts Counter
M90		Tool life group count Restart
M91		Tool Life Count Check
M92		Tool Life Count Pause (G10 L3)
M98		Call Sub Program
M99		Return to Main Program
M128	M328	Y1/Y2 Tool Internal coolant 1 ON
M129	M329	Y1/Y2 Tool Internal coolant 1 OFF
M138	M338	Y1/Y2 Tool Internal coolant 2 ON
M139	M339	Y1/Y2 Tool Internal coolant 2 OFF

Spindle \$1	Sub Spindle \$2	Description
M133		Chip Conveyor Forward
M134		Chip Conveyor Backward
M135		Chip Conveyor Stop
M146		Tool coolant checking ON
M147		Tool coolant checking OFF
M148		Coolant Inspection ON
M149		Coolant Inspection OFF
M150		Electric Current Limit OFF
M151		Electric Current Limit ON (when reach limit, G31 ON)
M152		Electric Current Limit ON (when reach limit, Feed Hold)
M170		Call OFF Machining Spindle
M171		Main Spindle As Machining Spindle
M172		Sub Spindle As Machining Spindle
M173		Spindle 3 As Machining Spindle
M174		Spindle 4 As Machining Spindle
M225		Finished Parts Conveyor ON
M226		Finished Parts Conveyor OFF
M2000		System Exchange OFF
M6000		Spindle Synchronization OFF
M6212		Spindle Synchronization (Speed)
M8212		Spindle Synchronization (Speed and C Axis)
! L1~! L99		Program waiting code

Sample Part



Sample Program

\$1
(2 INCH PORT DEMO IMTS 2022)
(BAR OUT 4.0)
!L1

N21(Turn R.03)
M170
M171
M136
G0G53X0
G97S2000M3
T2121
G54
G0Z.1
X2.Y0
G50S3500
G96S365M3
G71U.05R.05
G71P100Q200U.06W.01F.0080
N100G0X0
G1Z0F.005
G3X1.8Z-.9R.9
N200G1Z-3.2
G70P100Q200
G0Z.1
G97
M5
G0G53X0
M1

(FLATS)

N3
G69.1(END MILL 3/8")
M170
M173

G0G53Z-1.5
G53X-1.
G0G53B0.
T0303
G97S2000M44
M50
G54
G28C0.
G0C-90.
G0Y-1.3222Z-.1875
X2.
G1G98X1.4F20.57
Y1.3222
X1.6
G0X2.
Y-1.7420Z-.4688
G1X1.4
Y1.7420
X1.6
G0X2.
Y-1.9206Z-.75
G1X1.4
Y1.9206
X1.6
G0X2.
Y-1.9438Z-1.0313
G1X1.4
Y1.9438
X1.6
G0X2.
Y-1.9438Z-1.3125
G1X1.4
Y1.9438
X1.6
G0X2.1
G0C90.
G0Y-1.3222Z-.1875
X2.
G1G94X1.4F20.57
Y1.3222
X1.6
G0X2.
Y-1.7420Z-.4688
G1X1.4
Y1.7420

X1.6
G0X2.
Y-1.9206 Z-.75
G1 X1.4
Y1.9206
X1.6
G0 X2.
Y-1.9438Z-1.0313
G1X1.4
Y1.9438
X1.6
G0X2.
Y-1.9438Z-1.3125
G1X1.4
Y1.9438
X1.6
G0X2.
M51
G18
G0G53Z-1.M45
G53X0
M1

(LOGOS)

N6
G69.1(ENGRAVING TOOL)
M170
M173
G0G53Z-1.5
G53X-1.
G0G53B0.
G97S2000M44
T0202
M50
G28C0.
G0C-90.
G54
(MITSUBISHI LOGO)
G0Y0.2842Z-.9417
X2.0
G1G98X1.38F29.03
Y0.8474Z-.7741F11.61
Z-.6739
Y0.6162Z-.6065

Y-0.2282Z-.849
Y-0.4852Z-.7741
Y0.3428Z-.5363
Y-0.0264Z-.4287
Y-0.8448Z-.6723
Z-.8843
Y-0.6018Z-.9552
Y-0.8448Z-1.025
Z-1.1483
Y-0.0702Z-1.3685
Y0.0810
Y0.8474Z-1.1483
Z-.9216
Y-0.0264Z-1.183
Y-0.2788Z-1.1094
Y0.2842Z-.9417
X1.5F29.03
G0X2.1
G0C90.
G0Y0.5856Z-1.3256
X2.0
G1G98X1.38F29.03
Y0.9026F11.61
Y0.6108Z-1.0537
Y0.0202
Y0.3112Z-.8057
Y0.0000Z-.5392
Y-0.3014Z-.8038
Y-0.0284Z-1.0537
Y-0.5860
Y-0.8956Z-1.3256
Y-0.2988
Y-0.0050Z-1.0751
Y0.2686Z-1.3256
Y0.5856
G0X2.5
G99
M51
G53G0X0
G53G0Z-1.
M1

(PORTS)

N9
(END MILL 3/8" PORT FLAT)
M170
M173
G0G53Z0.0
G53X0
G0G53B45.
T0909
G97S2000M43
G56
G0Y0
M50
G28C0.
G0C0.(1ST PORT FLAT)
G68.2X1.1312Z-.3343P1J45.
G0Z.5M8

X1.2714Y.6325
G1G98Z0.0F15.03
X-.5909
G3G17X-.5909Y.07I0J-.1407
G1X.5909
G2X.5909Y-.4925I0J-.1406
G1X-1.3052
Z.3

G0C180.(2ND PORT FLAT)

G0Z.3M8
X1.2714Y.6325
G1G98Z0.0F15.03
X-.5909
G3G17X-.5909Y.07I0J-.1407
G1X.5909
G2X.5909Y-.4925I0J-.1406
G1X-1.3052
Z.1
G69.1
M45
G0G53Z0.0
G0G53X0
M1

N7
(.4056 DRILL PORTS)

M170
M173
G0G53Z-1.
G53X0.0
G0G53B45.
T0707
G97S2000M43
M50
G56
G28C0.
G0C0.
G68.2X1.1312Z-.3343P1J45.

(1ST DRILL PORT)
G0X0Y0
G0Z.5
G0Z.1
G98
G83Z-1.Q.2F15.
G80
G0Z.5

(2ND DRILL PORT)

G0C180.
G0Z.1
X0Y0
G98
G83Z-1.Q.1F15.
G80
G0Z.5
G69.1
M45
M51
G0G53Z-1.
G0G53X0Y0
M1

N12
(3/8 SPOT DRILL)
M170
M173
G0G53Z-1.
G53X0.0
G0G53B135.

T1212
G97S2000M43
M50
G56
G0Y0
G28C0.
G0C0.
G68.2X1.1312Z-.3343P1J45.
G0X0Z1.M8
Z.1
G98
G1G17Z-.04F13.
G41X-.1584Y.1152F12.
X-.3542Y.0296
G3X-.3712Y.0125R.025
X-.372Y0R.186F12.
X.372R.186
X-.372R.186
X-.3712Y-.0125R.186
X-.3542Y-.0296R.025
G40G1X-.1584Y-.1152
G0Z.1
G0Z.5
C180.

G1Z-.04F13.
G41X-.1584Y.1152F12.
X-.3542Y.0296
G3X-.3712Y.0125R.025
X-.372Y0R.186F12.
X.372R.186
X-.372R.186
X-.3712Y-.0125R.186
X-.3542Y-.0296R.025
G40G1X-.1584Y-.1152
G0Z.1
G0Z.5
G18
G99
G69.1
M45
M51
G0G53Z-1.
G0G53X0
M1

N8
(1/5-13 THREAD MILL PORTS)
M170
M173
G0G53Z-1.
G53X0.0
G0G53B45.
T0808
G97S2000M43
G56
M50
G28C0.
G0C0.
Y0
G68.2X1.1312Z-.3343P1J45.

(THREADMILL 1ST PORT)

G0X0Z1.
Z.1
G98
G1Z-.6096F30.8
G41X.0412Y-.0206F12.
G3X.0824Y0R.0206
X-.0824R.0412
X.0824R.0412
X-.0667Y.0242R.0412
X.0255Y-.0392R.0412
X.0519Y-.0132R.0206
G40G1X0Y0Z-.4519
G0Z.1
G1Z-.6096F94.8
G41X.0512Y-.0256F12.0
G3X.1024Y0R.0256
X-.1024R.0512
X.1024R.0512
X-.0828Y.0301R.0512
X.0316Y-.0487R.0512
X.0645Y-.0164R.0256
G40G1X0Y0Z-.4519
G0Z1.
Z.1
G1Z-.6096F30.0
G41X.0612Y-.0306F12.

G3X.1224Y0R.0306
X-.1224R.0612
X.1224R.0612
X-.099Y.036R.0612
X.0378Y-.0582R.0612
X.0771Y-.0196R.0306
G40G1X0Y0Z-.4519
G0Z1.

(THREADMILL 2ND PORT)

G0C180.
G0X0Z1.
Z.1
G1Z-.6096F30.0
G41X.0412Y-.0206F12.
G3X.0824Y0R.0206
X-.0824R.0412
X.0824R.0412
X-.0667Y.0242R.0412
X.0255Y-.0392R.0412
X.0519Y-.0132R.0206
G40G1X0Y0Z-.4519
G0Z.1
G1Z-.6096F94.8
G41X.0512Y-.0256F12.0
G3X.1024Y0R.0256
X-.1024R.0512
X.1024R.0512
X-.0828Y.0301R.0512
X.0316Y-.0487R.0512
X.0645 Y-.0164 R.0256
G40 G1 X0 Y0 Z-.4519
G0 Z1.
Z.1
G1 Z-.6096 F94.8
G41 X.0612 Y-.0306 F12.
G3 X.1224 Y0 R.0306
X-.1224 R.0612
X.1224 R.0612
X-.099 Y.036 R.0612
X.0378 Y-.0582 R.0612
X.0771 Y-.0196 R.0306
G40 G1 X0 Y0 Z-.4519
G0 Z1.

G69.1
G99
M45
M51
G0G53Z0.0
G0G53X0Y0
M1

N800(***TRANSFER***)
!L2
G54
M50
G28C0
G0C0.
G53X0
G53Y0
G53Z-6.5
!L100
(GRAB PART)
!L21
M51
!L3

M170
M171
M3S0
G4X0.5
!L10

!L11
M3S3000
(M8)
T2525
G0Y0.
Z0.015
X2.05
M76
G1X.6F0.0025
X-0.06F0.003
G53G0X0.0
!L5
!L21
M05

G4X1.
M89
!L20
!L6
G4X0.5
G97
!L8
G53G0X0.
M9
G53Z0.M49
!L7
M30

\$2
!L1

!L77
M1(M0)
!L78
!L10
N41(80 DEG R.015)
G53X0Y0Z0
T4141
M172
(M208)
(M248)
G97S1500M203
G99G0Y0
G0 X4.2 Y0
Z.1
G50 S4000
G96 S285
G18
X1.8
Z.11
X1.4
G1 G95 Z0
X1.5 Z-.05
Z-.9567
X1.35 Z-1.0638
Z-1.25
X1.7

G18

G2 X1.8 Z-1.3 R.05

G0 X4.2

Z.1

M1

N42(1.5-13 OD THREAD)

G53G0Z0

T4242

M172

G97S1500M204

G99G0Y0

X1.5

Z.3

G76P010060Q.002R.002

G76X1.3959Z-1.1P.052Q.015F.0769

G53Z0

M1

N45(1.0" DRILL)

G53G0Z0

T4545

M172

G97S1800M203

G99G0Y0

X0

G83Z-2.25Q.2F.005

G80

G53Z0

M1

N46(3/4" BB FINSH)

G53G0Z0

T4646

M172

G97S1500M203

G99G0Y0

X.9661

Z.1

G1Z0F.002

X.8662,R.05

Z-.1

X.6

G0Z1.5

G53Z0

M205

M1

N38(Part catcher Out)

G53G0X0.

M09

M209

G53G0Z-0.3937Y-0.3937

M34 (PART CATCHER FWD)

G53G0Z-6.0

G53G0Z-7.7

M211

M259 (PART EJECT FWD)

G4X1.

M260 (PART EJECT BACK)

G4X1.

M35(PART CATCHER BACK)

G53G0Z-0.39

M237

M1

N800(TRANSFER)

!L2

M250

G28C0

G0C0.

G4X0.5

G0G53Z0.

T3737

G53G0Y0.0

!L100

M257

(M236)

X0.

M77

M211

M70

M258

Z0.1

G98G1Z-1.6F500.

M237

M210

G4X1.0

M11

G4X1.0

G1G98W3.148F100.

M10

G4X0.5

!L21

M251

!L3

M6212

!L10

M210

M72

!L11

!L5

!L21

!L20

M73

M6000

G4X0.2

!L6

G53G0Z0.

!L8

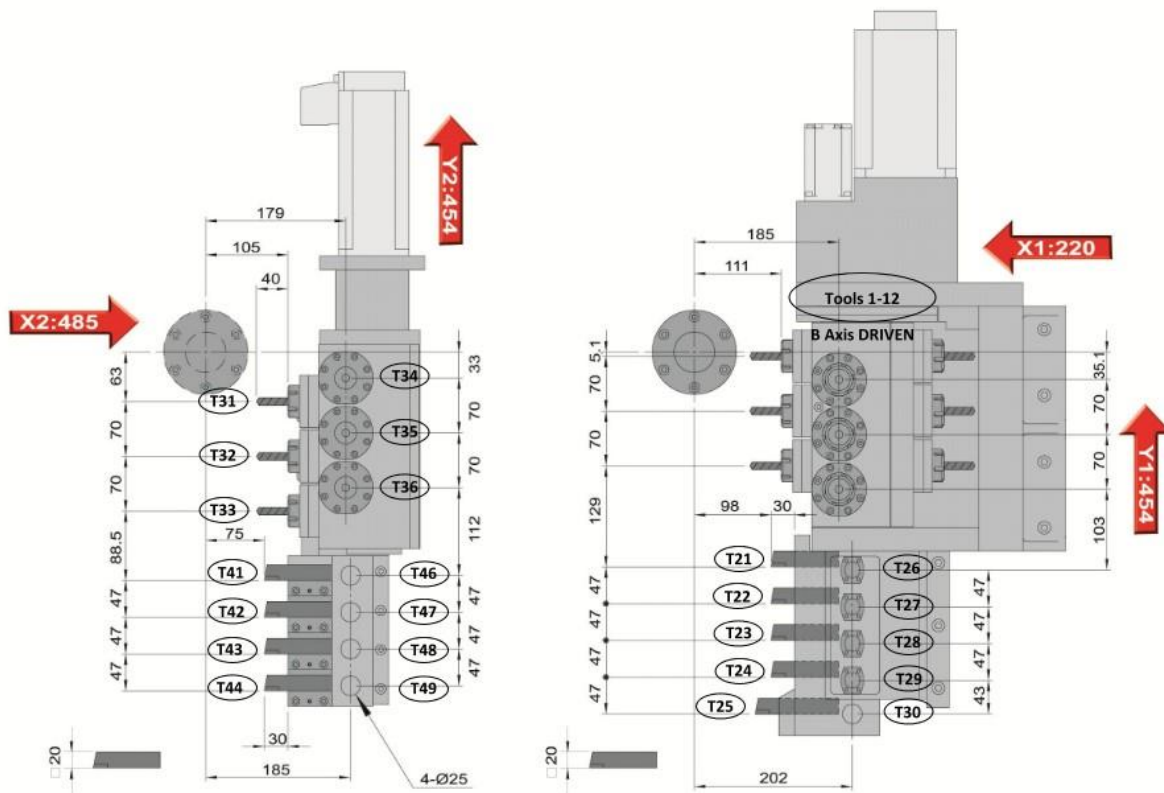
G53G0X0.0

G99

!L7

M30

Tool Layout



How To Take Z Axis Tool Offsets

1. Place the mode select switch in Hand-wheel.
2. Using the handwheel make a face cut
3. Go to the setup page on the control
4. Press the Tool Measure soft key
5. Press the Length Offset key
6. Cursor to the desired offset number and highlight the Z axis offset
7. Press the Zero Point offset key(This value is the current location on the tool in relation to the part zero)
8. If this face is going to be the part zero, then Press zero and input
9. If this face is going to be the rough face then input the rough facing allowance. Such as .015"
10. Now press the Measure Memory Key(Note the value of the Machine Position Counter will now be displayed in the Measure Position at the top of the screen)

11. Now press write offset to place the calculated Z offset value in the tool offset for Z

How To Take X Axis Tool Offsets

1. Manually take a turning cut on the material using the handwheel.(Make sure you take enough material to cut all the way around the stock)
2. Move off the work in Z but leave the tool at the position you took the cut in X
3. Turn off the spindle (Reset will stop the spindle)
4. Measure the cut diameter (You should still be on the tool measure screen)
5. Cursor over to the X offset
6. Press the Zero Point offset key (This is the current diameter you measured)
(In this case we measured .973")
7. Enter .973 and press input (Note the value .973 shows up in the Program Zero Offset area)
8. Now press the Measure Memory Key (Note the value of the Machine Position will now be displayed in the Measure Position at the top of the screen)
9. Press write offset to place the calculated X offset value in the tool offset for X

Notes on Taking Tool Offsets

To find the center of an ID bushing holder use an indicator to sweep in the center of the holder.

Use the same method that we used to pick up the X axis offset on tool 1 only place a zero in the Program Part Zero area instead of the .973

Z can be found after installing the tool in the holder using a gauge pin to touch off the end of the drill or ID tool

Use the same method we used for tool one and place the value of the gauge pin in the Program Zero Offset area by pressing Zero Point Offset entering the gauge value and press input and Press Offset Write

The sub spindle tools touch off the same. Make sure that you are on the correct system before taking the offsets. \$1 for the main spindle and \$2 for the sub spindle.

Tool numbers will have separate offsets for each side. You can have a tool one on the main and the sub and control the offsets independently.