



# SHOP NOTES

**Pocket Guide and Reference Charts  
for CNC Machinists**

**– Made in the U.S.A. –**



## WHAT'S INSIDE THIS BOOKLET?

Decimal Equivalent Chart / Millimeter to Inch Chart  
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Haas Lathe G-Codes / Haas Lathe M-Codes  
Abbreviations and Measurement Units  
Mill and Lathe Formulas  
Tapping and Threading Formulas  
Tap Drill Calculation  
Drill Point Depth & Countersink Formulas  
Degree Formulas



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Haas operator's manuals and other information may be downloaded for free from the Haas website ([www.HaasCNC.com](http://www.HaasCNC.com)). From the Haas home page, click on **Resource Center**, and then select **Manuals & Documentation**. Haas manuals and information are listed for you to access and download. Information is updated as necessary.



# DECIMAL EQUIVALENT CHART .0059 – .0980

# DECIMAL EQUIVALENT CHART .0995 – .2969



Decimal Equiv.	Drill Size	mm	Tap Sizes	Decimal Equiv.	Drill Size	mm	Tap Sizes	Decimal Equiv.	Drill Size	mm	Tap Sizes	Decimal Equiv.	Drill Size	mm	Tap Sizes
.0059	97	0.150		.0320	67	0.813		.0995	39	2.527		.1875	3/16	4.763	#12-32
.0063	96	0.160		.0330	66	0.838		.1015	38	2.578	#5-40	.1890	12	4.801	
.0067	95	0.170		.0350	65	0.889		.1040	37	2.642	#5-44	.1910	11	4.851	
.0071	94	0.180		.0360	64	0.914		.1065	36	2.705	#6-32	.1935	10	4.915	
.0075	93	0.191		.0370	63	0.940		.1094	7/64	2.778		.1960	9	4.978	
.0079	92	0.201		.0380	62	0.965		.1100	35	2.794		.1990	8	5.055	
.0083	91	0.211		.0390	61	0.991		.1110	34	2.819		.2010	7	5.105	1/4-20
.0087	90	0.221		.0400	60	1.016		.1130	33	2.870	#6-40	.2031	13/64	5.159	
.0091	89	0.231		.0410	59	1.041		.1160	32	2.946		.2040	6	5.182	
.0095	88	0.241		.0420	58	1.067		.1200	31	3.048		.2055	5	5.220	
.0100	87	0.254		.0430	57	1.092		.1250	1/8	3.175		.2090	4	5.309	
.0105	86	0.267		.0465	56	1.181		.1285	30	3.264		.2130	3	5.410	1/4-28
.0110	85	0.279		.0469	5/64	1.191	#0-80	.1360	29	3.454	#8-32 • #8-36	.2188	7/32	5.556	1/4-32
.0115	84	0.292		.0520	55	1.321		.1405	28	3.569		.2210	2	5.613	
.0120	83	0.305		.0550	54	1.397		.1406	9/64	3.572		.2280	1	5.791	
.0125	82	0.318		.0595	53	1.511	#1-64 • #1-72	.1440	27	3.658		.2340	A	5.944	
.0130	81	0.330		.0625	1/16	1.588		.1470	26	3.734		.2344	15/64	5.953	
.0135	80	0.343		.0635	52	1.613		.1495	25	3.797	#10-24	.2380	B	6.045	
.0145	79	0.368		.0670	51	1.702		.1520	24	3.861		.2420	C	6.147	
.0156	1/64	0.397		.0700	50	1.778	#2-56 • #2-64	.1540	23	3.912		.2460	D	6.248	
.0160	78	0.406		.0730	49	1.854		.1563	5/32	3.969		.2500	1/4&E	6.350	
.0180	77	0.457		.0760	48	1.930		.1570	22	3.988		.2570	F	6.528	5/16-18
.0200	76	0.508		.0781	5/64	1.984		.1590	21	4.039	#10-32	.2610	G	6.629	
.0210	75	0.533		.0785	47	1.994	#3-48	.1610	20	4.089		.2656	17/64	6.747	
.0225	74	0.572		.0810	46	2.057		.1660	19	4.216		.2660	H	6.756	
.0240	73	0.610		.0820	45	2.083	#3-56	.1695	18	4.305		.2720	I	6.909	5/16-24
.0250	72	0.635		.0860	44	2.184		.1719	11/64	4.366		.2770	J	7.036	
.0260	71	0.660		.0890	43	2.261	#4-40	.1730	17	4.394		.2810	K	7.137	
.0280	70	0.711		.0935	42	2.375	#4-48	.1770	16	4.496	#12-24	.2813	9/32	7.144	5/16-32
.0292	69	0.742		.0938	3/32	2.381		.1800	15	4.572		.2900	L	7.366	
.0310	68	0.787		.0960	41	2.438		.1820	14	4.623	#12-28	.2950	M	7.493	
.0313	1/32	0.794		.0980	40	2.489		.1850	13	4.699		.2969	19/64	7.541	



Tap drill sizes above based on approximately 75% full thread

Tap # Sizes #0 = .060 #1 = .073 #2 = .086 #3 = .099 #4 = .112

Tap # x .013 + .060 = Thread # OD



Tap drill sizes above based on approximately 75% full thread

Tap # Sizes #5 = .125 #6 = .138 #8 = .164 #10 = .190 #12 = .216

Tap # x .013 + .060 = Thread # OD



Decimal Equiv.	Drill Size	mm	Tap Sizes	Decimal Equiv.	Drill Size	mm	Tap Sizes	Tap Thread Size	Approx. inside Dia.	Approx. outside Dia.	Tap Drill
.3020	N	7.671		.5625	9/16	14.288	5/8-18				
.3125	5/16	7.938	3/8-16	.5781	37/64	14.684	5/8-24	1/8 - 27	1/4	3/8	11/32
.3160	O	8.026		.5938	19/32	15.081		1/4 - 18	3/8	17/32	7/16
.3230	P	8.204		.6094	39/64	15.478	11/16-12	3/8 - 18	1/2	11/16	37/64
.3281	21/64	8.334		.6250	5/8	15.875		1/2 - 14	5/8	13/16	23/32
.3320	Q	8.433	3/8-24	.6406	41/64	16.272	11/16-20 • 11/16-24	3/4 - 14	13/16	1	59/64
.3390	R	8.611		.6563	21/32	16.669	3/4-10	1 - 11 1/2	1 1/16	1 5/16	1 5/32
.3438	11/32	8.731	3/8-32	.6719	43/64	17.066		1 1/4 - 11 1/2	1 3/8	1 5/8	1 1/2
.3480	S	8.839		.6875	11/16	17.462	3/4-16	1 1/2 - 11 1/2	1 5/8	1 7/8	1 47/64
.3580	T	9.093		.7031	45/64	17.859	3/4-20	2 - 11 1/2	2 1/16	2 3/8	2 7/32
.3594	23/64	9.128		.7188	23/32	18.256		2 1/2 - 8	2 9/16	2 7/8	2 5/8
.3680	U	9.347	7/16-14	.7344	47/64	18.653	13/16-12				
.3750	3/8	9.525		.7500	3/4	19.050	13/16-16				
.3770	V	9.576		.7656	49/64	19.447	13/16-20 • 7/8-9				
.3860	W	9.804		.7813	25/32	19.844					
.3906	25/64	9.922	7/16-20	.7969	51/64	20.241	7/8-14				
.3970	X	10.084		.8125	13/16	20.637					
.4040	Y	10.262	7/16-28	.8281	53/64	21.034	7/8-20				
.4063	13/32	10.319		.8438	27/32	21.431					
.4130	Z	10.490		.8594	55/64	21.828	15/16-12				
.4219	27/64	10.716	1/2-13	.8750	7/8	22.225	15/16-16 • 1.0-8				
.4375	7/16	11.113		.8906	57/64	22.622	15/16-20				
.4531	29/64	11.509	1/2-20	.9063	29/32	23.019					
.4688	15/32	11.906	1/2-28	.9219	59/64	23.416	1.0-12				
.4844	31/64	12.303	9/16-12	.9375	15/16	23.813					
.5000	1/2	12.700	9/16-18	.9531	61/64	24.209	1.0-20				
.5156	33/64	13.097	9/16-24	.9688	31/32	24.606					
.5313	17/32	13.494	5/8-11	.9844	63/64	25.003					
.5469	35/64	13.891		1.000	1	25.400					

Pipe sizes are generally determined by the inside diameter of the pipe. The chart above gives nominal and approximate actual dimensions of commonly used sizes of standard threaded pipe.



**Tap drill sizes above based on approximately 75% full thread**  
**A decimal equivalent chart can be displayed on a Haas control by pressing the HELP/CALC button, and then selecting the Drill Table tab. Use the jog handle or cursor keys to scroll through the chart.**



**Spindle Command:** You can stop or start the spindle with CW or CCW (FWD and REV on a lathe) any time you're at a Single Block stop or a Feed Hold. When you restart the program with CYCLE START, the spindle will be turned back on to the previously defined speed.



# MILLIMETER TO INCH CHART 0.01 – 12.5

# MILLIMETER TO INCH CHART 12.6 – 25.4



mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
0.01	.0004	2.6	.1024	6.0	.2362	9.4	.3701	12.6	.4961	15.9	.6260	19.2	.7559	22.5	.8858
0.02	.0008	2.7	.1063	6.1	.2402	9.5	.3740	12.7	.5000	16.0	.6299	19.3	.7598	22.6	.8898
0.03	.0012	2.8	.1102	6.2	.2441	9.6	.3780	12.8	.5039	16.1	.6339	19.4	.7638	22.7	.8937
0.04	.0016	2.9	.1142	6.3	.2480	9.7	.3819	12.9	.5079	16.2	.6378	19.5	.7677	22.8	.8976
0.05	.0020	3.0	.1181	6.4	.2520	9.8	.3858	13.0	.5118	16.3	.6417	19.6	.7717	22.9	.9016
0.06	.0024	3.1	.1220	6.5	.2559	9.9	.3898	13.1	.5157	16.4	.6457	19.7	.7756	23.0	.9055
0.07	.0028	3.2	.1260	6.6	.2598	10.0	.3937	13.2	.5197	16.5	.6496	19.8	.7795	23.1	.9094
0.08	.0032	3.3	.1299	6.7	.2638	10.1	.3976	13.3	.5236	16.6	.6535	19.9	.7835	23.2	.9134
0.09	.0035	3.4	.1339	6.8	.2677	10.2	.4016	13.4	.5276	16.7	.6575	20.0	.7874	23.3	.9173
0.1	.0039	3.5	.1378	6.9	.2717	10.3	.4055	13.5	.5315	16.8	.6614	20.1	.7913	23.4	.9213
0.2	.0079	3.6	.1417	7.0	.2756	10.4	.4094	13.6	.5354	16.9	.6654	20.2	.7953	23.5	.9252
0.3	.0118	3.7	.1457	7.1	.2795	10.5	.4134	13.7	.5394	17.0	.6693	20.3	.7992	23.6	.9291
0.4	.0157	3.8	.1496	7.2	.2835	10.6	.4173	13.8	.5433	17.1	.6732	20.4	.8031	23.7	.9331
0.5	.0197	3.9	.1535	7.3	.2874	10.7	.4213	13.9	.5472	17.2	.6772	20.5	.8071	23.8	.9370
0.6	.0236	4.0	.1575	7.4	.2913	10.8	.4252	14.0	.5512	17.3	.6811	20.6	.8110	23.9	.9409
0.7	.0276	4.1	.1614	7.5	.2953	10.9	.4291	14.1	.5551	17.4	.6850	20.7	.8150	24.0	.9449
0.8	.0315	4.2	.1654	7.6	.2992	11.0	.4331	14.2	.5591	17.5	.6890	20.8	.8189	24.1	.9488
0.9	.0354	4.3	.1693	7.7	.3031	11.1	.4370	14.3	.5630	17.6	.6929	20.9	.8228	24.2	.9528
1.0	.0394	4.4	.1732	7.8	.3071	11.2	.4409	14.4	.5669	17.7	.6968	21.0	.8268	24.3	.9567
1.1	.0433	4.5	.1772	7.9	.3110	11.3	.4449	14.5	.5709	17.8	.7008	21.1	.8307	24.4	.9606
1.2	.0472	4.6	.1811	8.0	.3150	11.4	.4488	14.6	.5748	17.9	.7047	21.2	.8346	24.5	.9646
1.3	.0512	4.7	.1850	8.1	.3189	11.5	.4528	14.7	.5787	18.0	.7087	21.3	.8386	24.6	.9685
1.4	.0551	4.8	.1890	8.2	.3228	11.6	.4567	14.8	.5827	18.1	.7126	21.4	.8425	24.7	.9724
1.5	.0591	4.9	.1929	8.3	.3268	11.7	.4606	14.9	.5866	18.2	.7165	21.5	.8465	24.8	.9764
1.6	.0630	5.0	.1969	8.4	.3307	11.8	.4646	15.0	.5906	18.3	.7205	21.6	.8504	24.9	.9803
1.7	.0669	5.1	.2008	8.5	.3346	11.9	.4685	15.1	.5945	18.4	.7244	21.7	.8543	25.0	.9843
1.8	.0709	5.2	.2047	8.6	.3386	12.0	.4724	15.2	.5984	18.5	.7283	21.8	.8583	25.1	.9882
1.9	.0748	5.3	.2087	8.7	.3425	12.1	.4764	15.3	.6024	18.6	.7323	21.9	.8622	25.2	.9921
2.0	.0787	5.4	.2126	8.8	.3465	12.2	.4803	15.4	.6063	18.7	.7362	22.0	.8661	25.3	.9961
2.1	.0827	5.5	.2165	8.9	.3504	12.3	.4843	15.5	.6102	18.8	.7402	22.1	.8701	25.4	1.0
2.2	.0866	5.6	.2205	9.0	.3543	12.4	.4882	15.6	.6142	18.9	.7441	22.2	.8740		
2.3	.0906	5.7	.2244	9.1	.3583	12.5	.4921	15.7	.6181	19.0	.7480	22.3	.8780		
2.4	.0945	5.8	.2283	9.2	.3622			15.8	.6220	19.1	.7520	22.4	.8819		
2.5	.0984	5.9	.2323	9.3	.3661										



Setting 9 on a Haas allows you to change between **inch** and **millimeter** dimensioning.



When in EDIT or MEM mode, you can select and **display another program** from Memory quickly by entering the program number (0nnnnn) and pressing the down arrow key.



Tap Sizes	MM Tap Drill	Drill Dia. in Inches	Tap Sizes	MM Tap Drill	Drill Dia. in Inches	Metric Thd. Pitch	Thd. Pitch in Inches	Threads Per In.	Basic Height
M1 x 0.25	0.75	.0295	M14 x 2	12.00	.4724	.25	.00984	101.6002	.00639
M1.1 x 0.25	0.85	.0335	M14 x 1.5	12.50	.4921	.30	.01181	84.6668	.00767
M1.2 x 0.25	0.95	.0374	M16 x 2	14.00	.5512	.35	.01378	72.5716	.00895
M1.4 x 0.3	1.10	.0433	M16 x 1.5	14.50	.5709	.40	.01575	63.5001	.01023
M1.6 x 0.35	1.25	.0492	M18 x 2.5	15.50	.6102				
M1.8 x 0.35	1.45	.0571	M18 x 1.5	16.50	.6496	.45	.01772	56.4446	.01151
M2 x 0.4	1.60	.0630	M20 x 2.5	17.50	.6890	.50	.01969	50.8001	.01279
M2.2 x 0.45	1.75	.0689	M20 x 1.5	18.50	.7283	.60	.02362	42.3334	.01534
M2.5 x 0.45	2.05	.0807	M22 x 2.5	19.50	.7677	.70	.02756	36.2858	.01790
M3 x 0.5	2.50	.0984	M22 x 1.5	20.50	.8071				
M3.5 x 0.6	2.90	.1142	M24 x 3	21.00	.8268	.75	.02953	33.8667	.01918
M4 x 0.7	3.30	.1299	M24 x 2	22.00	.8661	.80	.03150	31.7501	.02046
M4.5 x 0.75	3.70	.1457	M27 x 3	24.00	.9449	.90	.03543	28.2228	.02301
M5 x 0.8	4.20	.1654	M27 x 2	25.00	.9843	1.00	.03937	25.4000	.02557
M6 x 1	5.00	.1969	M30 x 3.5	26.50	1.0433				
M7 x 1	6.00	.2362	M30 x 2	28.00	1.1024	1.25	.04921	20.3200	.03196
M8 x 1.25	6.75	.2657	M33 x 3.5	29.50	1.1614	1.50	.05906	16.9334	.03836
M8 x 1	7.00	.2756	M33 x 2	31.00	1.2205	1.75	.06890	14.5143	.04475
M10 x 1.5	8.50	.3346	M36 x 4	32.00	1.2598	2.00	.07874	12.7000	.05114
M10 x 1.25	8.75	.3445	M36 x 3	33.00	1.2992				
M12 x 1.75	10.20	.4016	M39 x 4	35.00	1.3780	2.50	.09843	10.1600	.06393
M12 x 1.25	10.80	.4252	M39 x 3	36.00	1.4173	3.00	.11811	8.4667	.07671
						3.50	.13780	7.2572	.08950
						4.00	.15748	6.3500	.10229
						4.50	.17717	5.6445	.11508
						5.00	.19685	5.0800	.12785
						6.00	.23622	4.2333	.15344



**Tap drill sizes based on 77% full metric thread**

Metric tap and drill sizes can be displayed on a Haas control by pressing the HELP/ CALC button twice, and then selecting the Drill Table tab.



**Clearing Current Commands Values:** On a Haas, the values in the CURNT COMDS display pages for Tool Life, Tool Load, and Timer registers can be cleared by cursor-selecting the one you wish to clear and pressing ORIGIN. To clear everything in a column, cursor to the top of that column (onto the title) and press ORIGIN.



Code	Description	Group	Code	Description	Group
G00*	Rapid Motion Positioning	01	G54*	Select Work Coordinate System #1	12
G01	Linear Interpolation Motion	01	G55	Select Work Coordinate System #2	12
G02	Circular Interpolation Motion CW	01	G56	Select Work Coordinate System #3	12
G03	Circular Interpolation Motion CCW	01	G57	Select Work Coordinate System #4	12
G04	Dwell	00	G58	Select Work Coordinate System #5	12
G09	Exact Stop	00	G59	Select Work Coordinate System #6	12
G10	Set Offsets	00	G60	Uni-Directional Positioning	00
G12	Circular Pocket Milling CW	00	G61	Exact Stop Mode	15
G13	Circular Pocket Milling CCW	00	G64*	G61 Cancel	15
G17*	XY Plane Selection	02	G65	Macro Subroutine Call Option	00
G18	XZ Plane Selection	02	G68	Rotation	16
G19	YZ Plane Selection	02	G69*	Cancel G68 Rotation	16
G20	Select Inches	06	G70	Bolt Hole Circle	00
G21	Select Metric	06	G71	Bolt Hole Arc	00
G28	Return To Machine Zero Point	00	G72	Bolt Holes Along an Angle	00
G29	Return From Reference Point	00	G73	High-Speed Peck Drilling Canned Cycle	09
G31	Feed Until Skip	00	G74	Reverse Tap Canned Cycle	09
G35	Automatic Tool Diameter Measurement	00	G76	Fine Boring Canned Cycle	09
G36	Automatic Work Offset Measurement	00	G77	Back Bore Canned Cycle	09
G37	Automatic Tool Offset Measurement	00	G80*	Canned Cycle Cancel	09
G40*	Cutter Compensation Cancel	07	G81	Drill Canned Cycle	09
G41	2D Cutter Compensation Left	07	G82	Spot Drill Canned Cycle	09
G42	2D Cutter Compensation Right	07	G83	Normal Peck Drilling Canned Cycle	09
G43	Tool Length Compensation + (Add)	08	G84	Tapping Canned Cycle	09
G44	Tool Length Compensation - (Subtract)	08	G85	Boring Canned Cycle	09
G47	Text Engraving	00	G86	Bore and Stop Canned Cycle	09
G49*	G43/G44/G143 Cancel	08	G87	Bore In and Manual Retract Canned Cycle	09
G50*	Cancel Scaling	11	G88	Bore In, Dwell, Manual Retract Canned Cycle	09
G51	Scaling	11	G89	Bore In, Dwell, Bore Out Canned Cycle	09
G52	Set Work Coordinate System	00 or 12	G90*	Absolute Position Command	03
G53	Non-Modal Machine Coordinate Selection	00	G91	Incremental Position Command	03

\* default

\* default



**Complete descriptions of all Haas G- and M-codes** are available from the Haas website ([www.HaasCNC.com](http://www.HaasCNC.com)). From the Haas home page, click on Resource Center, and then select Manuals & Documentation > G- and M-Codes.



In the Offset display on a Haas, you can **zero all offsets** at once by pressing ORIGIN, and following the simple on-screen commands. **You can't undo this.**



Code	Description	Group	Code	Description	Group
G92	Set Work Coordinate Systems Shift Value	00	G166	5-Axis Bore and Stop Canned Cycle	09
G93	Inverse Time Feed Mode	05	G169	5-Axis Bore and Dwell Canned Cycle	09
G94*	Feed Per Minute Mode	05	G174	CCW Non-Vertical Rigid Tap	00
G95	Feed per Revolution	05	G184	CW Non-Vertical Rigid Tap	00
G98*	Canned Cycle Initial Point Return	10	G187	Setting the Smoothness Level	00
G99	Canned Cycle R Plane Return	10	G188	Get Program From PST	00
G100	Cancel Mirror Image	00	G234	Tool Center Point Control (TCP)	08
G101	Enable Mirror Image	00	G254	Dynamic Work Offset (DWO)	23
G102	Programmable Output to RS-232	00	G255	Cancel Dynamic Work Offset (DWO)	23
G103	Limit Block Buffering	00			
G107	Cylindrical Mapping	00			
G110-G129	Coordinate System #7 - #26	12			
G136	Automatic Work Offset Center Measurement	00			
G141	3D+ Cutter Compensation	07			
G143	5-Axis Tool Length Compensation +	08			
G150	General Purpose Pocket Milling	00			
G153	5-Axis High Speed Peck Drilling Canned Cycle	09			
G154	Select Work Coordinates P1-P99	12			
G155	5-Axis Reverse Tap Canned Cycle	09			
G161	5-Axis Drill Canned Cycle	09			
G162	5-Axis Spot Drill Canned Cycle	09			
G163	5-Axis Normal Peck Drilling Canned Cycle	09			
G164	5-Axis Tapping Canned Cycle	09			
G165	5-Axis Boring Canned Cycle	09			

\* default



You can edit programs on a Haas while a program is running, using **Background (BG) Edit**. When running a program in MEM mode from the Program display, hit the EDIT button until the Background Editor pane appears on the right side of the screen. Press SELECT PROG to see a list of Memory programs you can BG Edit. Changes will take effect the next time the program is opened. You can select entire blocks of code to edit/copy/delete by pressing F2 on the first and last lines you want to highlight, and then using the INSERT, ALTER, DELETE, and UNDO commands. If you need to press the Cycle Start button for an M00/M01 while you're editing, just hit the MEM button to return to the active program. For older controls (mill software 15.xx and lathe software 8.xx and earlier), you can access BG Edit by entering the number of the program you want to edit (0nnnn) and pressing F4.



**To Zero the POS-OPER Display:** This display is used for reference only. Each axis can be zeroed out independently, to then show its position relative to where you selected to zero that axis. To zero out a specific axis, press HAND JOG, and then press POSIT. When you Handle Jog the X, Y, or Z axis and then press ORIGIN, the axis that is selected will be zeroed. Or, you can press an X, Y, or Z letter key and then ORIGIN to zero that axis display. You can also press the X, Y, or Z key and enter a number (X2.125), then press ORIGIN to enter the number in that axis display.





<b>M00</b>	Stop Program	<b>M49</b>	Set Status of Pallet
<b>M01</b>	Optional Program Stop	<b>M50</b>	Execute Pallet Change
<b>M02</b>	Program End	<b>M51-M58</b>	Set Optional User M-codes
<b>M03</b>	Spindle Commands	<b>M59</b>	Set Output Relay
<b>M04</b>	Spindle Commands	<b>M61-M68</b>	Clear Optional User M-codes
<b>M05</b>	Spindle Commands	<b>M69</b>	Clear Output Relay
<b>M06</b>	Tool Change	<b>M75</b>	Set G35 or G136 Reference Point
<b>M07</b>	Shower Coolant On	<b>M76</b>	Control Display Inactive
<b>M08</b>	Coolant On	<b>M77</b>	Control Display Active
<b>M09</b>	Coolant Off	<b>M78</b>	Alarm if Skip Signal Found
<b>M10</b>	Engage 4th Axis Brake	<b>M79</b>	Alarm if Skip Signal Not Found
<b>M11</b>	Release 4th Axis Brake	<b>M80</b>	Auto Door Open
<b>M12</b>	Engage 5th Axis Brake	<b>M81</b>	Auto Door Close
<b>M13</b>	Release 5th Axis Brake	<b>M82</b>	Tool Unclamp
<b>M16</b>	Tool Change	<b>M83</b>	Auto Air Gun On
<b>M17</b>	Unclamp APC Pallet and Open APC Door	<b>M84</b>	Auto Air Gun Off
<b>M18</b>	Clamp APC Pallet and Close Door	<b>M86</b>	Tool Clamp
<b>M19</b>	Orient Spindle	<b>M88</b>	Through-Spindle Coolant On
<b>M21-M28</b>	Optional User M Function with M-Fin	<b>M89</b>	Through-Spindle Coolant Off
<b>M30</b>	Program End and Reset	<b>M95</b>	Sleep Mode
<b>M31</b>	Chip Conveyor Forward	<b>M96</b>	Jump If No Input
<b>M33</b>	Chip Conveyor Stop	<b>M97</b>	Local Sub-Program Call
<b>M34</b>	Coolant Increment	<b>M98</b>	Sub-Program Cal
<b>M35</b>	Coolant Decrement	<b>M99</b>	Sub-Program Return or Loop
<b>M36</b>	Pallet Part Ready	<b>M109</b>	Interactive User Input
<b>M39</b>	Rotate Tool Turret		
<b>M41</b>	Low Gear Override		
<b>M42</b>	High Gear Override		
<b>M46</b>	Jump if Pallet Loaded		
<b>M48</b>	Check Validity of Current Program		



When **Setting 32** on a Haas machine is set to **IGNORE**, then all commands for turning coolant on or off will be ignored. The coolant can still be turned on and off manually with the **COOLNT** button.



**Jog Keys:** You can select an axis for jogging on a Haas by entering the axis letter on the input line and then pressing the **HANDLE JOG** button.



Code	Description	Group	Code	Description	Group
<b>G00*</b>	Rapid Motion Positioning	01	<b>G59</b>	Coordinate System #6 FANUC	12
<b>G01</b>	Linear Interpolation Motion	01	<b>G61</b>	Exact Stop Modal	15
<b>G02</b>	CW Circular Interpolation Motion	01	<b>G64*</b>	Exact Stop Cancel G61	15
<b>G03</b>	CCW Circular Interpolation Motion	01	<b>G65</b>	Macro Subroutine Call Option	00
<b>G04</b>	Dwell	00	<b>G70</b>	Finishing Cycle	00
<b>G09</b>	Exact Stop	00	<b>G71</b>	O.D./I.D. Stock Removal Cycle	00
<b>G10</b>	Set Offsets	00	<b>G72</b>	End Face Stock Removal Cycle	00
<b>G14</b>	Secondary Spindle Swap	17	<b>G73</b>	Irregular Path Stock Removal Cycle	00
<b>G15</b>	Secondary Spindle Cancel	17	<b>G74</b>	End Face Grooving Cycle	00
<b>G17</b>	XY Plane Selection	00	<b>G75</b>	O.D./I.D. Grooving Cycle	00
<b>G18*</b>	XZ Plane Selection	02	<b>G76</b>	Threading Cycle, Multiple Pass	00
<b>G19</b>	YZ Plane Selection	02	<b>G80*</b>	Canned Cycle Cancel	09
<b>G20</b>	Select Inches	06	<b>G81</b>	Drill Canned Cycle	09
<b>G21</b>	Select Metric	06	<b>G82</b>	Spot Drill Canned Cycle	09
<b>G28</b>	Return To Machine Zero Point	00	<b>G83</b>	Normal Peck Drilling Canned Cycle	09
<b>G29</b>	Return From Reference Point	00	<b>G84</b>	Tapping Canned Cycle	09
<b>G31</b>	Skip Function	00	<b>G85</b>	Boring Canned Cycle	09
<b>G32</b>	Thread Cutting	01	<b>G86</b>	Bore and Stop Canned Cycle	09
<b>G40*</b>	Tool Nose Compensation Cancel	07	<b>G87</b>	Bore and Manual Retract Canned Cycle	09
<b>G41</b>	Tool Nose Compensation (TNC) Left	07	<b>G88</b>	Bore and Dwell and Manual Retract Canned Cycle	09
<b>G42</b>	Tool Nose Compensation (TNC) Right	07	<b>G89</b>	Bore and Dwell Canned Cycle	09
<b>G50</b>	Set Global coordinate Offset FANUC, YASNAC	00	<b>G90</b>	O.D./I.D. Turning Cycle	01
<b>G51</b>	Cancel Offset (YASNAC)	00	<b>G92</b>	Threading Cycle	01
<b>G52</b>	Set Local Coordinate System FANUC	00	<b>G94</b>	End Facing Cycle	01
<b>G53</b>	Machine Coordinate Selection	00	<b>G95</b>	Live Tooling Rigid Tap (Face)	09
<b>G54*</b>	Coordinate System #1 FANUC	12	<b>G96</b>	Constant Surface Speed On	13
<b>G55</b>	Coordinate System #2 FANUC	12	<b>G97*</b>	Constant Surface Speed Off	13
<b>G56</b>	Coordinate System #3 FANUC	12	<b>G98</b>	Feed Per Minute	10
<b>G57</b>	Coordinate System #4 FANUC	12	<b>G99*</b>	Feed Per Revolution	10
<b>G58</b>	Coordinate System #5 FANUC	12	<b>G100</b>	Disable Mirror Image	00

\* default

\* default



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Setting 22 on a Haas, **Can Cycle Delta Z**, defines the distance above the previous peck that a tool will rapid back to during a mill and lathe G83 peck drill or the amount it pulls back in a G74 and G75 lathe grooving cycle. It also defines the distance the tool retracts to break the chip in a mill G73 peck drill canned cycle.



Code	Description	Group			
G101	Enable Mirror Image	00	<b>M00</b>	Stop Program	
G102	Programmable Output to RS-232	00	<b>M01</b>	Stop Program	
G103	Limit Block Lookahead	00	<b>M02</b>	Program End	
G105	Servo Bar Command	09	<b>M03</b>	Spindle On Fwd	
G110	Coordinate System #7	12	<b>M04</b>	Spindle On Rev	
G111	Coordinate System #8	12	<b>M05</b>	Spindle Stop	
G112	XY to XC interpretation	04	<b>M08</b>	Coolant On	
G113	Cancel G112	04	<b>M09</b>	Coolant Off	
G114-G129	Coordinate System #9 - #24	12	<b>M10</b>	Chuck Clamp	
G154	Select Work Coordinates P1-99	12	<b>M11</b>	Chuck Unclamp	
G159	Background Pickup / Part Return		<b>M12</b>	Auto Jet Air Blast On (Optional)	
G160	APL Axis Command Mode Only		<b>M13</b>	Auto Jet Air Blast Off (Optional)	
G161	APL Axis Command Mode Off		<b>M14</b>	Main Spindle Brake On (Optional C-Axis)	
G184	Reverse Tapping Canned Cycle For Left Hand Threads	09	<b>M15</b>	Main Spindle Brake Off (Optional C-Axis)	
G186	Reverse Live Tool Rigid Tap (For Left Hand Threads)	10	<b>M17</b>	Turret Rotation Fwd	
G187	Accuracy Control	00	<b>M18</b>	Turret Rotation Rev	
G195	Forward Live Tool Radial Tapping (Diameter)	00	<b>M19</b>	Orient Spindle (Optional)	
G196	Reverse Live Tool Radial Tapping (Diameter)	00	<b>M21</b>	Tailstock Advance (Optional)	
G198	Disengage Synchronous Spindle Control	00	<b>M22</b>	Tailstock Retract (Optional)	
G199	Engage Synchronous Spindle Control	00	<b>M23</b>	Chamfer Out of Thread On	
G200	Index on the Fly	00	<b>M24</b>	Chamfer Out of Thread Off	
G211	Manual Tool Setting		<b>M30</b>	End of Program and Reset	
G212	Auto Tool Setting		<b>M31</b>	Chip Auger Forward (Optional)	
G241	Radial Drill Canned Cycle	09	<b>M33</b>	Chip Auger Stop (Optional)	
G242	Radial Spot Drill Canned Cycle	09	<b>M36</b>	Parts Catcher On (Optional)	
G243	Radial Normal Peck Drilling Canned Cycle	09	<b>M37</b>	Parts Catcher Off (Optional)	
G245	Radial Boring Canned Cycle	09	<b>M38</b>	Spindle Speed Variation On	
G246	Radial Bore and Stop Canned Cycle	09	<b>M39</b>	Spindle Speed Variation Off	
G247	Radial Bore and Manual Retract Canned Cycle	09	<b>M41</b>	Low Gear (Optional)	
G248	Radial Bore and Dwell and Manual Retract Canned Cycle	09	<b>M42</b>	High Gear (Optional)	
G249	Radial Bore and Dwell Canned Cycle	09			



**Transferring Simple Calculations:** In the Haas Calculator display, the number in the simple calculator box (upper left corner) can be transferred to any cursor-selected data line on the page in either EDIT or MDI. Cursor to the register to which you wish to transfer the calculator number, and press F3.



On a Haas, you can use the **DIST-TO-GO** screen to quickly zero out the Position display for a reference move. When in Handle Jog mode and in the Position display, press any other operation mode key (EDIT, MEM, etc.), and then go back to Handle Jog. This will zero out all axes on the DIST-TO-GO display, and begin showing the distance moved.



<b>M43</b>	Turret Unlock (Service Use Only)
<b>M44</b>	Turret Lock (Service Use Only)
<b>M51-M58</b>	User M Turn On (Optional)
<b>M59</b>	Set Output Relay
<b>M61-M68</b>	User M Turn Off (Optional)
<b>M69</b>	Clear Output Relay
<b>M76</b>	Display Disable
<b>M77</b>	Display Enable
<b>M78</b>	Alarm if Skip Signal Found
<b>M79</b>	Alarm if Skip Signal Not Found
<b>M85</b>	Automatic Door Open (Optional)
<b>M86</b>	Automatic Door Close (Optional)
<b>M88</b>	High-Pressure Coolant On (Optional)
<b>M89</b>	High-Pressure Coolant Off (Optional)
<b>M95</b>	Sleep Mode
<b>M96</b>	Jump If No Signal
<b>M97</b>	Local Subprogram Call
<b>M98</b>	Subprogram Call
<b>M99</b>	Subprogram Return Or Loop

<b>M104</b>	Probe Arm Extend (Optional)
<b>M105</b>	Probe Arm Retract (Optional)
<b>M109</b>	Interactive User Input
<b>M110</b>	Secondary Spindle Chuck Clamp (Optional)
<b>M111</b>	Secondary Spindle Chuck Unclamp (Optional)
<b>M112</b>	Secondary Spindle Air Blast On (Optional)
<b>M113</b>	Secondary Spindle Air Blast Off (Optional)
<b>M114</b>	Secondary Spindle Brake On (Optional)
<b>M115</b>	Secondary Spindle Brake Off (Optional)
<b>M119</b>	Secondary Spindle Orient (Optional)
<b>M121-M128</b>	User M-codes (Optional)
<b>M133</b>	Live Tool Fwd (Optional)
<b>M134</b>	Live Tool Rev (Optional)
<b>M135</b>	Live Tool Stop (Optional)
<b>M143</b>	Secondary Spindle Forward (Optional)
<b>M144</b>	Secondary Spindle Reverse (Optional)
<b>M145</b>	Secondary Spindle Stop (Optional)
<b>M154</b>	C-Axis Engage (Optional)
<b>M155</b>	C-Axis Disengage (Optional)



On a Haas, it's easy to **transfer a program from MDI** and save it to your list of programs. In the MDI display, make sure that the cursor is at the beginning of the MDI program. Enter a program number (Onnnnn) that's not being used. Then press **ALTER** and this will transfer the MDI data into your **List of Programs** under that program number.



**To Rapid an Axis Home:** You can rapid *all* axes to machine zero by pressing the **HOME G28** key. You can also send just one axis (X, Y, Z, A, or B) to machine zero in rapid motion. Enter the letter X, Y, Z, A, or B, then press **HOME G28** and that axis alone will rapid home. **CAUTION!** There is no warning to alert you of any possible collision!



°C = Degrees Celsius

**DIA** = Diameter

**d** = Depth of Cut

**F** = Feed in Inches or mm Per Minute (F)

°F = Degrees Fahrenheit

**FPR** = Feed Per Revolution (F)

**FPT** = Feed Per Tooth

**IPM** = Inches Per Minute

**IPR** = Inches Per Revolution

**L** = Length of Cut

**MRR** = Metal Removal Rate (cubic in./min.)

**RPM** = Revolutions Per Minute

**SFM** = Surface Feed Per Minute

**SMPM** = Surface Meters Per Minute

**MMPR** = Millimeters Per Revolution

**T** = Number of Teeth in a Cutter

**TCm** = Time Cutting in Minutes

**TCs** = Time Cutting in Seconds

**TPI** = Threads Per Inch

**W** = Width of Cut

Cutting Speed (surface feet/min.)

**SFM** =  $0.262 \times \text{DIA} \times \text{RPM}$

Revolutions Per Minute

**RPM** =  $3.82 \times \text{SFM} \div \text{DIA}$

Feed Rate (in/min.)

**IPM** =  $\text{FPT} \times \text{T} \times \text{RPM}$

Feed Per Revolution

**FPR** =  $\text{IPM} \div \text{RPM}$

Feed Per Tooth (in)

**FPT** =  $\text{IPM} \div (\text{RPM} \times \text{T})$

Metal Removal Rate

**MRR** =  $\text{W} \times \text{d} \times \text{F}$

Converting IPR to IPM

**IPM** =  $\text{IPR} \times \text{RPM}$

Converting IPM to IPR

**IPR** =  $\text{IPM} \div \text{RPM}$

Converting SFM to SMPM

**SMPM** =  $\text{SFM} \times .3048$

Converting IPR to MMPR

**MMPR** =  $\text{IPR} \times 25.40$

Distance over Time (in minutes)

**L** =  $\text{IPM} \times \text{TCm}$

Time Cutting over Distance (Mill) (minutes)

**TCm** =  $\text{L} \div \text{IPM}$

Time Cutting over Distance (Mill) (seconds)

**TCs** =  $\text{L} \div \text{IPM} \times 60$

Time Cutting over Distance (Lathe) (seconds)

**TCs** =  $\text{L} \div (\text{IPR} \times \text{RPM}) \times 60$

## INCH METRIC CONVERSION

mm x 0.03937 = in.

in. x 25.4 = mm

m x 39.37 = in.

in. x 0.0254 = m

m x 3.2808 = ft

ft x 0.3048 = m

m x 1.0936 = yd

yd x 0.9144 = m

km x 0.621 = mi

mi x 1.6093 = km

Celsius to Fahrenheit

(°C x 1.8) + 32 = °F

Fahrenheit to Celsius

(°F - 32) ÷ 1.8 = °C



**Chip Conveyor** - The chip conveyor on a Haas can be turned on or off when a program is running, either manually using the control keys or in the program using M-codes. The M-code equivalent to CHIP FWD is M31, and CHIP STOP is M33. You can set the Conveyor Cycle time (in minutes) with Setting 114, and the Conveyor On-Time (in minutes) with Setting 115.



**Setting 36 PROGRAM RESTART:** When it is ON, you are able to start a program from the middle of a tool sequence. You cursor to the line on which you want to start and press CYCLE START. It will scan the entire program to ensure the tools, offsets, G codes, and axes positions are set correctly before starting and continuing at the block where the cursor is positioned. Although you can leave this setting ON all the time, it may cause the machine to perform certain activities unnecessarily, so it's best to turn it OFF when you're done using it.



## INCH TAPS

$$\text{Tap Drill Size (inch)} = \text{Thread Diameter} - \frac{0.01299 \times \% \text{ of Full Thread}}{\text{Number of TPI}}$$

$$\% \text{ of Full Thread (inch)} = \text{Number of TPI} \times \frac{\text{Major DIA of Thread} - \text{Drilled DIA}}{0.01299}$$

$$\text{IPM (Mill Tapping Feed Rate)} = \text{RPM} \div \text{TPI}$$

$$\text{IPR (Lathe Threading)} = 1 \div \text{TPI}$$

$$\text{Form Tap Drill Size} = \text{Basic Tap DIA} - \frac{0.0068 \times \% \text{ of Full Thread}}{\text{Number of TPI}}$$

Recommended 65% form thread:

$$\text{Form Tap Drill Size} = \text{Basic Tap DIA} - \frac{0.442}{\text{Number of TPI}}$$

## METRIC TAPS

$$\text{Tap Drill Size (metric)} = \text{Thread Diameter (mm)} - \frac{\% \text{ of Full Thread} \times \text{MM Pitch}}{147.06}$$

$$\% \text{ of Full Thread (metric)} = \frac{147.06}{\text{MM Pitch}} \times [\text{Thread DIA (mm)} - \text{Drilled Hole DIA (mm)}]$$

$$\text{SMPM} = \text{RPM} \times \text{Metric Pitch}$$

Recommended 65% form thread:

$$\text{Form Tap Drill Size (metric)} = \text{Basic Tap DIA} - (.75 \times \text{pitch (in metric)} \times .65)$$



**Memory Lock Keyswitch:** This is a Haas machine feature that prevents operators from editing or deleting programs, and from altering settings. Since the keyswitch locks the settings, it also allows you to lock areas within the settings. Setting 7 locks parameters; Parameters 57, 209, and 278 lock other features. Setting 8 locks all programs. Setting 23 locks 09xxx programs. Setting 119 locks offsets. Setting 120 locks macro variables. In order to edit or change these areas, the keyswitch must be unlocked and its setting turned off.



**Tool Life Management:** In the CURNT COMDS display on a Haas you can PAGE DOWN to the Tool Life Management page. On this page, the Tool Usage register indexes by one every time that tool is called up in the spindle. You enter the number of times you want that tool to be used in the Alarm column. When the Usage number for that tool reaches the number of uses in the Alarm column, it will stop the machine with an alarm. This will help you monitor tools to prevent them from breaking, and prevent parts being scrapped.

## FIND TAP DRILL SIZES ON ANY BASIC SIZE THREAD

for an Approximate 75% Thread

NC/NF INCH & ISO METRIC

Major dia. less thread pitch = Tap drill size

Note: thread pitch = 1.0 inch divided by threads per inch (TPI)

Inch Example:

$$(1 \div 16 = .0625)$$

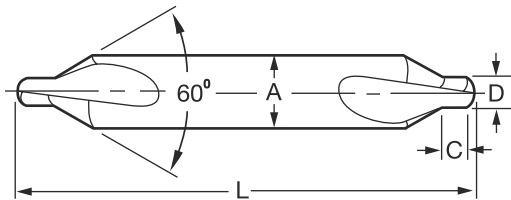
$$3/8 - 16 = .375 - .0625 = .3125 \text{ tap drill}$$

Metric Example:

$$M10 - 1.5 = 10 - 1.5 = M8.5 \text{ tap drill}$$



STANDARD 60° CENTERDRILL



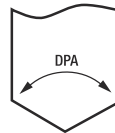
Size	Body Dia (A)	Drill Dia (D)	Drill Length (C)	OAL (L)
00	1/8	0.025	0.030	1 1/8
0	1/8	1/32	0.038	1 1/8
1	1/8	3/64	3/64	1 1/4
2	3/16	5/64	5/64	1 7/8
3	1/4	7/64	7/64	2
4	5/16	1/8	1/8	2 1/8
5	7/16	3/16	3/16	2 3/4
6	1/2	7/32	7/32	3
7	5/8	1/4	1/4	3 1/4
8	3/4	5/16	5/16	3 1/2

To calculate drill tip depth for a chamfer diameter, or drill point depth for a required drilling depth:

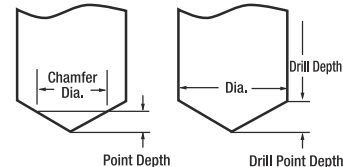
Drill Point Angle (DPA)	Factor
60°	0.866 x Dia. = Point Depth
82°	0.575 x Dia. = Point Depth
90°	0.500 x Dia. = Point Depth
118°	0.300 x Dia. = Point Depth
120°	0.288 x Dia. = Point Depth
135°	0.207 x Dia. = Point Depth

Example: To calculate for a 118-degree drill tip depth, multiply the dia. by 0.3  
i.e., 0.250 drill diameter x .3 = 0.075 drill tip depth

DRILL POINT ANGLE



CHAMFERING or DRILLING



**Setting 103: CYC START / FH SAME KEY.** This is good to use when you're carefully running through a program on a Haas. When this setting is on, the CYCLE START button functions as the Feed Hold key as well. When CYCLE START is pressed and held in, the machine will run through the program; when it's released, the machine will stop in a Feed Hold. This gives you much better control when testing a new program. When you're done using this feature, turn it off. This setting can be changed while running a program. It cannot be on when Setting 104 is on; when one of these settings is turned on, the other will automatically turn off.



**Setting 104: JOG HANDL TO SNGL BLK.** When Setting 104 is on and a program is running in MEM mode in the Program or Graphics display, pressing the SINGLE BLOCK key allows you to cycle through your program one line at a time, whether the machine is running or you're in Graphics. First press the CYCLE START button, and then each counterclockwise click of the jog handle will step you through the program line by line. Turning the handle clockwise will cause a Feed Hold. This setting can be changed while running a program. It cannot be on when Setting 103 is on; when one of these settings is turned on, the other will automatically turn off.



### CONVERT MINUTES OF A DEGREE TO A DECIMAL:

Divide minutes by 60

degree minutes to convert:  $30^{\circ} 42'$   
 divide minutes by 60:  $42 \div 60 = 0.7$   
 bring down degrees:  $30.7^{\circ}$

### CONVERT MINUTES AND SECONDS TO DECIMAL:

Divide seconds, then minutes by 60

degree minutes and seconds to convert:  $30^{\circ} 41' 15''$   
 divide seconds by 60:  $15 \div 60 = 0.25$   
 divide decimal minutes by 60:  $41.25 \div 60 = 0.6875$   
 bring down degrees:  $30.6875^{\circ}$

### CONVERT A DECIMAL DEGREE TO MINUTES:












Multiply decimal by 60

decimal degree to convert:  $30.7^{\circ}$   
 multiply decimal degree by 60:  $0.7 \times 60 = 42'$   
 bring down degrees:  $30^{\circ} 42'$

### CONVERT DECIMAL TO MINUTES AND SECONDS:

Multiply decimal by 60

decimal degree to convert:  $30.6875^{\circ}$   
 multiply the degree decimal by 60:  $0.6875 \times 60 = 41.25'$   
 multiply decimal minutes by 60:  $0.25 \times 60 = 15''$   
 bring down degrees:  $30^{\circ} 41' 15''$

	When in the EDIT mode, pressing SELECT PROG will bring up the list of programs in the active (highlighted) window.
	Press F2 to begin SELECTING A PROGRAM BLOCK to be copied, moved, or deleted. Scroll down to last line of program block. Press either F2 or the WRITE/ENTER key to select block.
	Press EDIT to SWITCH BACK AND FORTH between the left and right sides of the Edit display when editing programs on both sides of the Advanced Editor.
	Press INSERT to copy a selected (highlighted) program block to the line after the one the cursor is on.
	Press ALTER to move a selected (highlighted) program block to the line after the one the cursor is on.
	Press DELETE to delete a selected program block that is highlighted.
	Press UNDO to deselect a highlighted program block. UNDO will simply exit the block definition and return the cursor function back to normal. It will not undo any edits done in block edit.
	F4 will swap the inactive program for the active program in the Advanced Editor.
	Displays help information.
	Press F1 to access the pop-up menu for easy access to editor functions: HELP, MODIFY, SEARCH, EDIT, and PROGRAM.
	The ERASE PROG key will bring up a program list (with the header "Delete Program From List") on the inactive side of the Edit display. You can then cursor to a program and delete it by pressing WRITE.



**Advanced Editor Quick Cursor Arrow:** You can call up a cursor arrow with which to scroll through your program quickly, line by line, when you're in the Advanced Editor. For the quick cursor arrow, press F2 once; then you can use the jog handle to scroll line by line through the program. To get out of this quick-cursor mode and remain where you are in the program, just press the UNDO key.



**Duplicating a Program in LIST PROG:** In the LIST PROG mode, you can duplicate an existing program by cursor-selecting the program number you wish to duplicate, typing in a new program number (0nnnnn), and then pressing F2 (on older machines, press F1). You can also go to the Advanced Editor menu to duplicate a program, using the PROGRAM menu and the DUPLICATE ACTIVE PROGRAM item.



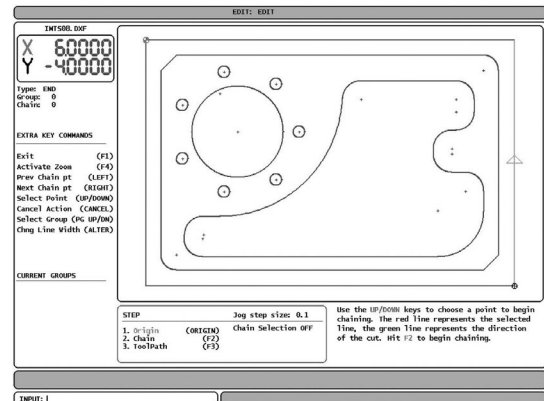
## SAVING ENERGY MEANS SAVING MONEY

- Auto Power-Off by setting the number of minutes of idle time after which the control will turn itself off
- Power-Off at M30 sets the control to start a 30-second timer that will turn off all power unless interrupted
- Coolant pump shutoff setting
- Screen saver delay setting
- LCD display shutoff setting
- Conveyor shutoff setting
- Servo and hydraulics shutoff setting



**greener. innovation.**

- Import DXF data directly into the Haas mill or lathe control and create cutting toolpaths using the Haas Intuitive Programming System
- Simplifies programming of basic part features
- Program multi-tool processes in one simple step:
  - Spot drill, drill & tap
  - Drill for pocket entry and cut pocket
  - Rough and finish lathe contours
- Automatic and manual chaining capability
- Program output is fully editable G-code





The Haas Wireless Intuitive Probing System (WIPS) – with optical transmission for part setting, tool setting and inspection – consists of the following elements:

- Spindle Probe Module (work probe)
- Tool Setter Module (tool probe)
- Intuitive Probing System Software

The Haas Wireless Intuitive Probing System makes probing easy to understand and use through simple language, a graphical interface and clear instructions.

- Records feedrate and spindle-speed override adjustments while the machine is in cycle
- Records coolant on/off and P-COOL position
- Records notes while in cycle for later use

After the program is finished, one press of the F4 key will display the adjustments and show where they were made. When you choose to accept the changes, Program Optimizer will edit your program with the new speeds, feeds and notes, while displaying the original values in parentheses.

- Simplifies editing for easy program alterations
- Easy optimization of speeds and feeds

**Additional information** about the Haas Wireless Intuitive Probing System is available from the Haas website ([www.HaasCNC.com](http://www.HaasCNC.com)). From the Haas home page, click on **Resource Center**, and then enter WIPS in the Search function.

**Additional information** about the Program Optimizer is available from the Haas website ([www.HaasCNC.com](http://www.HaasCNC.com)). From the Haas home page, click on **Resource Center**, and then enter Program Optimizer in the Search function.



**Tool Load Management:** Press the PAGE UP or PAGE DOWN key in CURNT COMDS to page to the Tool Load page. Spindle load condition can be defined for a particular tool, and the machine will stop if it reaches the spindle load limit defined for that tool. A tool overload condition can result in one of four actions by the control. The action is determined by Setting 84. ALARM will generate an alarm when overload occurs; FEED HOLD will stop with a Feed Hold when overload occurs; BEEP will sound an audible alarm when overload occurs; or AUTOFEED will automatically decrease the feedrate. This will also help you monitor tools.



**Leaving Messages:** You can enter a message in the MESSAGES display for the next operator, or for yourself. It will be the first display shown when you power up the machine, if there are no alarms other than the usual 102 SERVOS OFF alarm. If the machine was powered down using EMERGENCY STOP, the MESSAGES display will not show up when you turn the machine on again. Instead, the control will display the active alarm generated by the emergency stop. In this case, you would have to press the ALARM/MESSAGES key to view a message. It is not necessary to hit EMERGENCY STOP when you power down a Haas machine.



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**At the Resource Center**, you'll find a library of valuable information – searchable by machine type and topic – like maintenance, how-to videos, manuals, simple repair procedures, and lots more. Go to HaasCNC.com and click on Resource Center.

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**HaasParts.com**  
Your source for genuine OEM Haas parts.  
The official Haas Automation CNC parts website.

**Start your search**

Machine Serial Number

Search by Part Number

A machine serial number will quickly narrow your search. Without it, you'll be searching through hundreds of parts.

**How does this site work?**

1. Enter the Haas machine serial number.
2. Find the parts you need.
3. Place your order.
4. Your local HFO will contact you to finalize payment and delivery.

Find Your Local HFO

**At HaasParts.com**, you can find typical service parts and maintenance items, like filters, bulbs, and lubricants – all with up-front pricing. Use your machine serial number to focus on only those parts that will fit. No need to look through hundreds of parts to find the ones that fit your machine – the HaasParts database takes care of it for you.



**Send and Receive Offsets, Settings, Parameters, Macro Variables, Programs, and more to/from Disk.** Offsets, settings, parameters, macro variables, ATM information, IPS information, alarm history, keystroke history, linear screw compensation, pallet information, and programs can be saved to a storage device. Press LIST PROG, then select the device to save to or load from. Press F4 and select the appropriate function, then press WRITE.



**Send and Receive Offsets, Settings, Parameters, and Macro Variables to/from Disk.** For controls using software versions M15.xx and L8.xx and older, offsets, settings, parameters, and macro variables can be saved to or loaded from a storage device. Press LIST PROG, select DESTINATION, and then select an OFFSET, SETNG, PARAM, or Macro Variables (PAGE DOWN from CURNT COMDS) display page. Type in a file name, and then press F2 to write to, or F3 to read from disk.



January						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

March						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

January						
S	M	T	W	T	F	S
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February						
S	M	T	W	T	F	S
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29					

March						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

April						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May						
S	M	T	W	T	F	S
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

April						
S	M	T	W	T	F	S
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

May						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

June						
S	M	T	W	T	F	S
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

July						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August						
S	M	T	W	T	F	S
					1	
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

July						
S	M	T	W	T	F	S
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

August						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

September						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

November						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

October						
S	M	T	W	T	F	S
				1		
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

November						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

December						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31



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