

OPERATION

Cut Charts

The following Cut Charts show the consumable parts, cutting speed and the gas and torch settings required for the specific process.

The HD4070 system will automatically select and adjust the power and gas (including amperage, gas type and gas flow rate) required for the material and thickness to be cut.

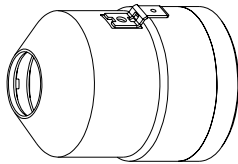
If the Hypertherm Integrated Command THC option is installed, the HD4070 system will also automatically adjust torch settings required for the specific process, including arc volts, torch standoff, initial pierce height and pierce time delay.

The numbers shown in the Cut Charts are the HD4070's default values and should provide high quality cuts with minimal dross. Because of differences between installations and material composition, adjustments may be required to obtain desirable results.

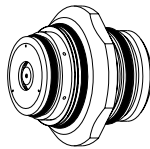
Marking

N₂ or H5 Plasma / N₂ Shield

O-Ring Colors: Black/Black (see page 4-14)



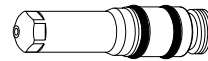
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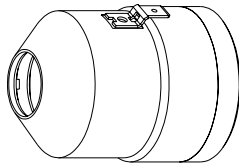
Material	Test Preflow Rate (%)				Test Cutflow Rate (%)				Marking Amps	Arc Voltage	Torch-to-work distance		Cutting Speed	
	Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m
	Gas	Rate	Gas	Rate	Gas	Rate	Gas	Rate						
Mild Steel	N ₂	25	N ₂	80	N ₂	20	N ₂	80	7	153	.09	2.3	250	6350
Stainless Steel	H5	50	N ₂	80	H5	40	N ₂	80	7	84	.09	2.3	120	3050
Aluminum	H5	50	N ₂	80	H5	20	N ₂	80	10	80	.09	2.3	175	4450

Note: Any of the mild steel consumable sets can also be used for marking. The mild steel consumables will not have the same performance characteristics as the dedicated marking consumables and may not be suitable for all applications. The settings in the table above are for all marking uses.

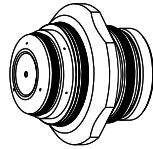
Mild Steel

O₂ Plasma / O₂-N₂ Shield
30A Cutting

O-Ring Color: Black/Red (see page 4-14)



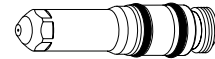
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Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness gauge/inch	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor %	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂								
10	16	10	60	40	0	10	0	26/.018	114	.05	1.25	215	5500	170	0
								24/.024	114			200	5100		0
								22/.030	115			170	4350		0
								20/.036	116			155	3950		0
								18/.048	117			110	2800		0
10	16	10	60	28	0	10	0	16/.060	119	.05	1.25	85	2150	170	.1
								14/.075	120			60	1500		.3
								12/.105	122			50	1200		.4
								10/.135	123			40	1000		.5
								3/16	128			30	800		.6
								1/4	128			.06	1.5		25

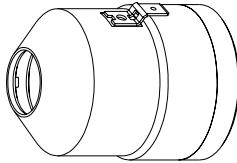
Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor %	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂								
10	16	10	60	40	0	10	0	1	117	1.25	.05	3356	140	170	0
								2	120			1524	60		.3
								3	122			1270	50		.4
								4	124			940	37		.5
								5	128			737	29		.7
								6	128			1.5	.06		635

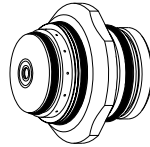
Pierce height = Torch-to-work distance X Pierce height factor

Stainless Steel
N₂ Plasma / N₂ Shield
45A Cutting

O-Ring Color: Gray/Red (see page 4-14)



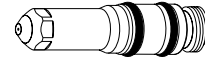
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Test Preflow Rate (%)		Test Cutflow Rate (%)		Material Thickness gauge/inch	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma	Shield	Plasma	Shield			in	mm	ipm	mm/m		
N ₂	N ₂	N ₂	N ₂							%	
30	75	40	75	20/.038	110	.1	2.5	220	5588	180	0.0
				18/.050				210	5334		0.1
				16/.063				180	4572		0.2
				14/.078				155	3937		0.2

Pierce height = Torch-to-work distance X Pierce height factor

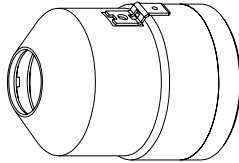
Test Preflow Rate (%)		Test Cutflow Rate (%)		Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma	Shield	Plasma	Shield			mm	in	mm/m	ipm		
N ₂	N ₂	N ₂	N ₂							%	
30	75	40	75	1	110	2.5	.1	5461	215	180	0.0
				2				3937	155		0.2

Pierce height = Torch-to-work distance X Pierce height factor

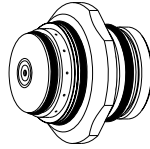
Aluminum

**Air Plasma / Air Shield
30A Cutting**

O-Ring Color: White/Red (see page 4-14)



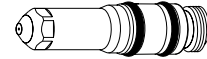
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Test Preflow Rate (%)		Test Cutflow Rate (%)		Material Thickness gauge/Inch	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma	Shield	Plasma	Shield			in	mm	ipm	mm/m		
Air	Air	Air	Air								
30	50	30	50	18/.048 16/.06	112	.04	1	71 47	1800 1200	150	0 .1

Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)		Test Cutflow Rate (%)		Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma	Shield	Plasma	Shield			mm	in	mm/m	ipm		
Air	Air	Air	Air								
30	50	30	50	1	112	1	.04	2030	80	150	0

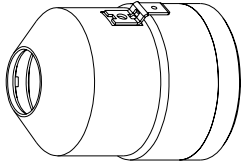
Pierce height = Torch-to-work distance X Pierce height factor

OPERATION

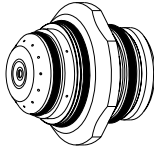
Mild Steel

O₂ Plasma / O₂-N₂ Shield
70A Cutting

O-Ring Color: Black/Yellow (see page 4-14)



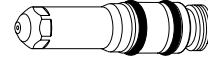
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Test Preflow Rate (%)				Test Cutoff Rate (%)				Material Thickness gauge/ inch	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂							%	
10	38	80	30	40	0	30	10	16/.060	108	.04	1	280	7100	200	.1
								14/.075	108			230	5800		
								12/.105	112			80	2000		
								10/.135	116			70	1800		
								3/16	118			55	1400		
								1/4	126	.06	1.5	35	875	250	.5
								5/16	132	.08	2.0	27.5	700		
								3/8	137	.10	2.0	20	500	1	

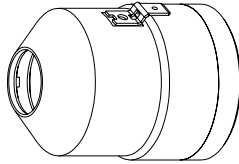
Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)				Test Cutoff Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂							%	
10	38	80	30	40	0	30	10	2	108	1	.04	5700	225	200	.1
								3	112			1900	75		
								4	117			1500	60		
								5	119			1000	40		
								6	125			900	36		
								8	132	2.0	.08	700	28	250	.8
								10	138	2.5	.10	450	18		

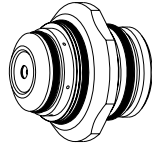
Pierce height = Torch-to-work distance X Pierce height factor

Stainless Steel
H35-N₂ Plasma / N₂ Shield
70A Cutting

O-Ring Color: Gray/Yellow (see page 4-14)



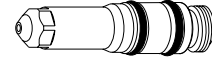
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Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness gauge/ inch	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂							%	
0	30	0	75	0	30	0	75	16/.063	123	.06	1.5	380	9652	200	0
								14/.078				350	8890		
								12/.109				140	3556		
								10/.141				130	3302		
12	17	0	65	12	17	0	45	3/16	141	.12	3.0	80	2032	200	.3
								1/4	144			50	1270		.4
								5/16	145			45	1143		.5
								3/8	146			40	1016		.6

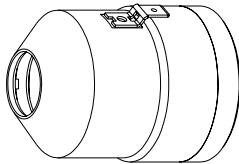
Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂							%	
0	30	0	75	0	30	0	75	2	123.0	1.5	.06	8890	350	200	0
								3	148.0	5.0	.20	3429	135	100	.2
								4				3048	120		
12	17	0	65	12	17	0	45	5	141.5	3.0	.12	1879	74	200	.4
								6	143.5			1270	50		
								8	145.0			1143	45		

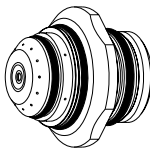
Pierce height = Torch-to-work distance X Pierce height factor

Aluminum
Air Plasma / CH₄ Shield
70A Cutting

O-Ring Color: White/Yellow (see page 4-14)



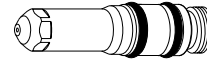
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Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness gauge/inch	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
CH ₄	Air	CH ₄	Air	CH ₄	Air	CH ₄	Air								
0	50	0	60	0	37	20	10	18/.048	162.5	.12	3	130	3302	170	.1
							0	16/.06	160			125	3175		.2
								14/.075	165			115	2921		.2
							30	12/.105	174			95	2413		.3
								1/8	174.5			90	2286		.4
								10/.135	175			85	2159		.4
						3/16		176	60	1524	.5				
						1/4		176	45	1143	.5				
						5/16		177	40	1016	.6				
							3/8	178	35	889	.6				

Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
CH ₄	Air	CH ₄	Air	CH ₄	Air	CH ₄	Air								
0	50	0	60	0	37	20	0	2	165	30	.12	2921	115	170	.2
								3	174	48	.19	2337	92	110	.4
								4	175			1905	75		.4
								5	176			1448	57		.5
								6	176			1143	45		.5
								8	177			1016	40		.6

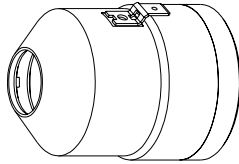
Pierce height = Torch-to-work distance X Pierce height factor

Mild Steel

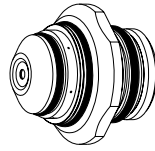
O₂ Plasma / O₂-N₂ Shield

100A Cutting

O-Ring Color: Black/Green (see page 4-14)



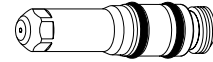
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Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (inch)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂							%	
15	40	40	10	37	0	40	10	1/4	128	.08	2.0	145	3700	200	.3
		35	10	45		35	10	5/16	129	.09	2.25	110	2800		.4
		12	33	45		12	33	3/8	130	.10	2.5	95	2400		.5
		35	10	50		35	10	7/16	135	.12	3.0	80	2000		.6
		35	10	50		35	10	1/2	141	.14	3.5	65	1700		.7

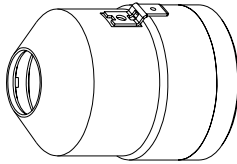
Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂							%	
15	40	40	10	37	0	40	10	6	128	2.0	.08	3700	145	200	.3
		35		45		35		8	132	2.25	.09	2800	110		.4
		12		45		10		10	136	2.5	.10	2500	100		.5
		35		50		12		140	3.5	.14	1850	73	.7		

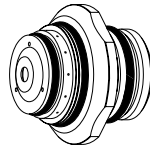
Pierce height = Torch-to-work distance X Pierce height factor

Stainless Steel
H35-N₂ Plasma / N₂ Shield
100A Cutting

O-Ring Color: Gray/Green (see page 4-14)



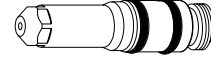
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Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (inch)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂							%	
17	20	0	75	17	20	0	45	1/4	123	.10	2.5	65	1651	200	.6
							60	5/16				60	1524		
					75		3/8	55				1397			
					16		60	7/16	126	.11	2.8	48	1219	210	.7
				13	75	1/2	128	.12	3.0	40	1016	220	.8		

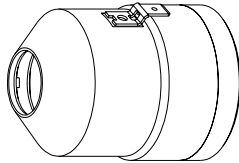
Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂							%	
17	20	0	75	17	20	0	45	6	123	.10	2.5	1651	65	200	.6
							60	8				1524	60		
					75		10	1397				55			
					13		75	12	128	.12	3.0	1016	40	220	.8

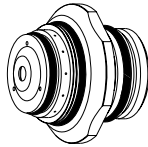
Pierce height = Torch-to-work distance X Pierce height factor

Aluminum
H35-N₂ Plasma / N₂ Shield
100A Cutting

O-Ring Color: White/Green (see page 4-14)



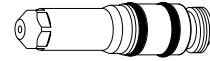
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Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (inch)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂								
17	20	0	75	17	20	0	75	1/4	136.5	.16	4.1	65	1651	170	.6
							30	3/8	136.0	.17	4.3	55	1397	160	.7
							30	1/2	142.0	.18	4.6	40	1016	150	.8

Pierce height = Torch-to-work distance X Pierce height factor

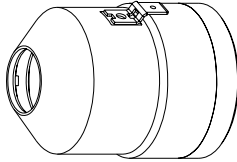
Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂								
17	20	0	75	17	20	0	75	6	136.5	.16	4.1	1651	65	170	.6
							45	8	136.0	.17	4.3	1524	60	160	
								10	137.0			1346	53		
							30	12	142.0	.18	4.6	1016	40	150	.8

Pierce height = Torch-to-work distance X Pierce height factor

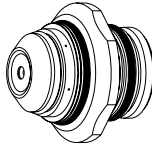
OPERATION

Mild Steel O₂ Plasma / O₂-N₂ Shield 200A Cutting

O-Ring Color: Black/Blue (see page 4-14)



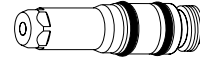
120907



120692



120691



120690

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (inch)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂								
5	45	13	60	71	0	15	57	3/8	142.0	.16	4.0	130	3302	200	.30
								7/16	143.0			110	2794		.40
								1/2	144.5			90	2286		.50
								9/16	144.0			84	2134		.50
								5/8	144.0			77	1956		.60
								3/4	144.0			65	1651		.75
								7/8	149.0			50	1270		.90
								1	153.5			35	889		1.0
								.18	4.5	50	1270				
								.20	5.0	35	889				

Pierce height = Torch-to-work distance X Pierce height factor

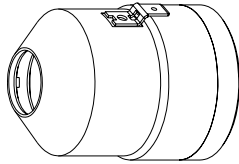
Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
O ₂	N ₂	O ₂	N ₂	O ₂	N ₂	O ₂	N ₂								
5	45	13	60	71	0	15	57	10	142.0	4	.16	3175	125	200	.3
								12	144.0			2515	99		.5
								15	144.0			2057	81		.6
								20	144.0			1651	65		.8
								25	153.5			889	35		1
										5	.20	889	35		

Pierce height = Torch-to-work distance X Pierce height factor

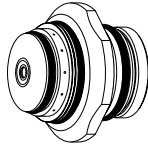
Stainless Steel

H35-N₂ Plasma / N₂ Shield
200A Cutting

O-Ring Color: Gray/Blue (see page 4-14)



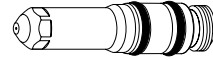
120907



120727



120726



120725

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (inch)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂							%	
31	0	0	80	31	45	0	80	3/8	160	.16	4.0	80	2032	150	.5
								7/16	161			78	1981		.6
								1/2	162			75	1905		.6
								9/16	163	.17	4.5	70	1778		.7
								5/8	164			.18	62		1575
								3/4	166	.20	5.0	50	1270		1

Pierce height = Torch-to-work distance X Pierce height factor

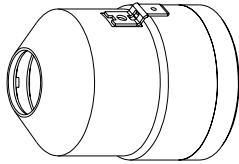
Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂							%	
31	0	0	80	31	45	0	80	10	160.0	4.0	.16	2032	80	150	.5
								12	161.5	4.0	.16	1905	75		.6
								15	163.5	4.5	.18	1651	65		.8
								20	166.5	5.0	.20	1270	50		1

Pierce height = Torch-to-work distance X Pierce height factor

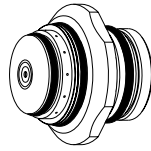
OPERATION

Aluminum H35-N₂ Plasma / N₂ Shield 200A Cutting

O-Ring Color: White/Blue (see page 4-14)



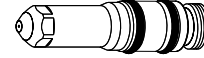
120907



120762



120761



120760

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (inch)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				in	mm	ipm	mm/m		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂								
31	0	0	70	31	45	0	70	3/8	153.5	.25	6.25	120	3048	150	.5
			50				1/2	154.5	100			2540	.6		
							5/8	159.5	80			2032	.8		
							3/4	163.5	60			1524	1		

Pierce height = Torch-to-work distance X Pierce height factor

Test Preflow Rate (%)				Test Cutflow Rate (%)				Material Thickness (mm)	Arc Voltage	Torch-to-work distance		Cutting Speed		Pierce Height Factor	Pierce Delay Time
Plasma		Shield		Plasma		Shield				mm	in	mm/m	ipm		
H35	N ₂	H35	N ₂	H35	N ₂	H35	N ₂								
31	0	0	70	31	45	0	70	10	153.5	6.25	.25	2997	118	150	.5
			50				12	154.5	2667			105	.6		
							15	158.0	2159			85	.8		
							20	164.0	1524			60	1		

Pierce height = Torch-to-work distance X Pierce height factor