

SELECTING A PUNCH

The following information is provided as a convenient general reference guide for metal punching operations.

HOLE SIZE VS. MATERIAL THICKNESS

Punching holes in metal is the fast, economical way to get precise hole size, smoothness and minimum burr. Compressive strength of the punch steel determines that the thickness of the metal being punched must not exceed the diameter of the punch. This relationship varies with the type of material. For example: the minimum hole diameter will be 1/4" in 1/4" mild steel, 1/4" in 3/16" stainless steel, and 1/4" in 5/16" aluminum.

MAXIMUM RATED CAPACITY

All punching tools have their maximum capacity for safe, dependable operation over a long life span. The hydraulic punches listed in this catalog have a "rated capacity" based on their design strength. Before selecting a tool, use the following charts to determine the specific tonnage required to punch the size and shape holes through the type and gauge metal considered.

DETERMINING TONNAGES FOR ROUND HOLES

To determine tonnages for hot rolled mild steel (typically used in bar size angle iron, channels, tees and zeos) with a 50,000 PSI shear strength, read directly from chart #1. Example: To punch a 3/8" diameter hole thru 3/8" thick mild steel, chart #1 shows 11.1 tons are required. For ASTM A-36 steel (typically used for structural size wide flange, H and I beams, tees and zeos) with a 60,000 PSI shear strength, read direct from chart #2. Example: To punch a 1/4" round hole in 1/4" thick A-36 steel, chart #2 shows 5.9 tons of force is needed.

CHART #1		TONS OF PRESSURE REQUIRED TO PUNCH MILD STEEL												TONS OF PRESSURE	
Material		Round Hole Diameter													
Thickness		1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"		
Gauge	Inches														
20	1/32	.4	.5	.7	.9	1.1	1.2	1.4	1.6	1.8	1.9	2.1	2.3		
18	3/64	.5	.7	.9	1.2	1.4	1.6	1.9	2.1	2.4	2.6	2.8	3.1		
16	1/16	.6	.9	.6	1.5	1.8	2.1	2.3	2.6	2.9	3.2	3.5	3.8		
14	5/64	.7	1.1	1.2	1.8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8		
12	7/64	1.0	1.5	1.5	2.6	3.1	3.6	4.1	4.6	5.1	5.7	6.2	6.7		
11	1/8	1.2	1.8	2.1	2.9	3.5	4.1	4.7	5.1	5.9	6.2	7.1	7.6		
10	9/64	1.3	2.0	2.4	3.3	4.0	4.6	5.3	5.9	6.6	7.3	7.9	8.6		
3/16"	3/16	—	2.8	2.6	4.6	5.5	6.4	7.4	8.3	9.2	10.1	11.0	12.0		
1/4"	1/4	—	—	3.7	6.1	7.4	8.6	9.8	11.1	12.3	13.5	14.7	16.0		
5/16"	5/16	—	—	4.9	7.8	9.2	10.7	12.3	13.9	15.4	17.0	18.5	20.0		
3/8"	3/8	—	—	—	—	11.1	12.8	14.8	16.5	18.5	20.2	22.1	23.8		
1/2"	1/2	—	—	—	—	—	—	19.7	22.0	24.6	26.9	29.5	31.8		

TONS OF PRESSURE	CHART #2 TONS OF PRESSURE REQUIRED TO PUNCH ASTM-A36 STRUCTURAL STEEL													
	Material		Round Hole Diameter											
	Thickness		1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"
	Gauge	Inches												
	12	7/64	1.2	1.9	2.5	3.1	3.7	4.3	4.9	5.6	6.2	6.8	7.4	8.0
	11	1/8	1.4	2.1	2.8	3.5	4.2	4.9	5.7	6.4	7.1	7.8	8.5	9.2
	10	9/64	—	2.4	3.2	4.0	4.8	5.6	6.4	7.2	7.9	8.7	9.5	10.3
	3/16"	3/16	—	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11.0	12.1	13.2	14.3
	1/4"	1/4	—	4.4	5.9	7.4	8.6	10.3	11.8	13.2	14.7	16.2	17.7	19.1
	5/16"	5/16	—	—	7.4	9.2	11.0	12.9	14.7	16.5	18.4	20.2	22.0	24.0
3/8"	3/8	—	—	8.8	11.0	13.3	15.5	17.7	19.9	22.1	24.3	26.5	28.7	
1/2"	1/2	—	—	—	—	—	—	23.6	26.5	29.4	32.4	35.3	38.3	