

# TMC SPECIFICATION

NO. S 951

REV: 0 A B

COMPILED: WNJ, FRD

CHECKED: *Jordan ZRD* APPD: *MM 4/27/65*

SHEET 1 OF 4

TITLE:

typed by vab

4/27/65

## STANDARD

### DESIGN STANDARDS FOR SHEET METAL FABRICATIONS

1565

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- A. See also S-904 "Gauges, Wire & Metal"
- B. The following clearance hole diameters for machine screws should be used to insure mating of pieces misaligned by a maximum of 1/32 inch.

SCREW SIZE	FINE OR COARSE	MAJOR DIAM.	HEAD DIAM.	CLEARANCE HOLE DIAM.
2-56	C	.086	.167	7/64
3-48	C	.099	.193	1/8
4-40	C	.112	.219	9/64
6-32	C	.138	.270	11/64
8-32	C	.164	.322	13/64
10-24	C	.190	.373	15/64
10-32	F	.190	.373	15/64
1/4-20	C	.250	.492	9/32

- C. In sheet metal work, external tooth lockwashers (LWE) are to be used exclusively. The one exception is on the front of front panels where internal tooth lockwashers (LWI) shall be used when required.
- D. To allow for greater play between mating parts, swage nuts (NT129) or tapped holes shall be used ~~only~~ where a hex nut (NTH) would not be accessible or where frequent separation of mating pieces is expected.
- E. Countersunk screw holes should be used only where functionally required. A countersink limits the amount of play between mating parts.
- F. A countersunk hole should never be mated with a swage nut as there is zero play allowed in this type of construction.
- G. With the standard tolerance on fractional dimensions as  $\pm 1/64$ , the use of a 64th dimension should be avoided.
- H. Holes on mating pieces should be referenced from the same points. See the drawing on the next page.

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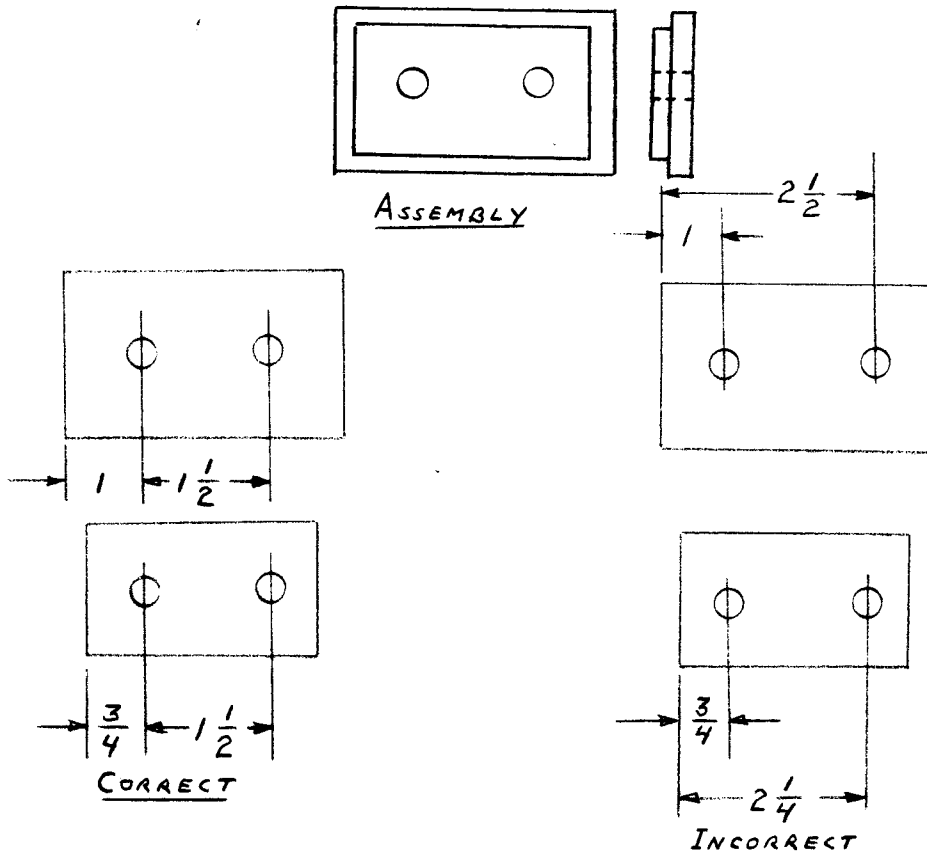
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TITLE: **DESIGN STANDARD FOR SHEET METAL FABRICATIONS**

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- I. Handles should be placed on front panels  $1 \frac{3}{8}$  inches from each edge. This leaves  $16 \frac{1}{4}$  inches between handles.
- J. In order to insure proper operation of slides, the outside width of the basic unit (exclusive of the front panel & inclusive of the side plates) should be  $17 \frac{1}{64}$  inches.
- K. The following type and tempers of aluminum should be specified and used wherever possible:

2024-T3 High strength and hardness, screw machine products.  
 5052-H32 General sheet metal work, zero bend radius.  
 6061-T351 Heavy duty structures.  
 6063-T5 Extrusions and tubing.

- L. Nominal weight of aluminum-Pounds per lineal foot:

<u>THICKNESS</u> <u>INCHES</u>	<u>WIDTH IN INCHES</u>					
	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>	<u>12</u>
.032	.075	.150	.226	.301	.376	.452
.064	.150	.301	.452	.601	.752	.904
.081	.190	.381	.571	.762	.952	1.14
.125	.294	.588	.882	1.18	1.47	1.76

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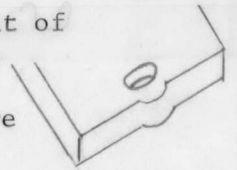
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TITLE: DESIGN STANDARDS FOR SHEET METAL FABRICATIONS

THICKNESS INCHES	WIDTH IN INCHES					
	2	4	6	8	10	12
.188	.442	.884	1.33	1.77	2.21	2.65
.250	.587	1.17	1.76	2.34	2.94	3.53

M. Not enough distance between part edge and hole. If the amount of stock between the part edge and a hole is less than the metal thickness, piercing will produce a bulge on the part edge.  
 Correction: Move hole; alter the blank profile to allow more metal, or use a notch instead of a hole.



N. Problem: Holes too close to a bend.  
 Rule: Minimum distance from a hole edge to a bend is 1.5 times material thickness plus the bend radius.



P. Problem: Failure to provide relief notches for bend within blank profile. (As shown)

Solution: Change blank profile to provide necessary relief.

Q. The following chart is for recommended hole sizes for Type F thread cutting tapping screws in sheet metal and structural steel.



SCREW DIAM.	SHEET STEEL, STRUCTURAL STEEL, STAINLESS STEEL, MONEL METAL, BRASS, ALUMINUM ALLOY			SCREW DIAM.	SHEET STEEL, STRUCTURAL STEEL, STAINLESS STEEL, MONEL METAL, BRASS, ALUMINUM ALLOY			
	Metal Thickness	Drilled or Clean-Punched Hole			Metal Thickness	Drilled or Clean-Punched Hole		
		HOLE REQ.	Drill Size No.			HOLE REQ.	Drill Size No.	
No. <b>2-56</b>	.048"	.073"	49	No. <b>10-32</b>	.048"	.159"	21	
	.060"	.073"	49		.060"	.161"	20	
	.075"	.076"	48		.075"	.166"	19	
	.105"	.078"	47		.105"	.169"	18	
	to .156"				.125"	.169"	18	
No. <b>4-40</b>	.048"	.093"	42		.135"	.169"	18	
	.060"	.096"	41		.164"	.173"	17	
	.075"	.096"	41		.187"	.177"	16	
	.105"	.099"	39		to .500"			
	to .156"				.060"			.166"
No. <b>6-32</b>	.048"	.111"	34	No. <b>10-24</b>	.075"	.169"	18	
	.060"	.113"	33		.105"	.169"	18	
	.075"	.116"	32		.125"	.173"	17	
	.105"	.120"	31		.135"	.173"	17	
	to .375"				.164"	.173"	17	
No. <b>8-32</b>	.048"	.140"	28		.187"	.177"	16	
	.060"	.144"	27		to .500"			
	.075"	.144"	27		.060"			.213"
	.105"	.147"	26		1/4"-20	.075"	.221"	2
	.125"	.147"	26			.105"	.221"	2
	.135"	.147"	26	.125"		.228"	1	
	.164"	.149"	25	.135"		.228"	1	
	to .375"			.187"		.234"	1 5/64"	
				.250"		.238"	Letter B	
				to .625"				

**IMPORTANT:** For satisfactory results holes must be neither too large nor too small. Size of hole depends upon kind of material, its hardness, uniformity, etc. In most cases hole sizes shown are suitable. If material is very hard a size larger drill might be necessary; if material is very soft a size smaller drill should be used.

