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Dragon Tooth® Insulation Piercing Connectors

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Dragon Tooth® Insulation Piercing Connectors

Thomas & Betts

United States
Tel: 901.252.8000
800.816.7809
Fax: 901.252.1354

Technical Services
Tel: 888.862.3289

www.tnb.com

Dragon Tooth®

Overview

Splice, tap and terminate magnet wire quickly and easily!

The tough, high-temperature insulation on magnet wire used by electrical motor and transformer manufacturers creates problems in splicing and terminating. The durability of magnet wire insulation has made dip-soldering or brazing extremely difficult without stripping the insulation.

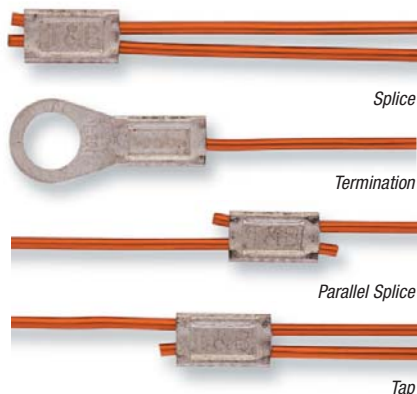
Another splicing and terminating challenge involves the use of aluminum for magnet applications. A manufacturer connecting aluminum magnet wire to copper is faced with the problem of the different coefficients of thermal expansion of the two metals, galvanic corrosion, cold flow, and the rapid formation of oxide film on the wire surface.

T&B offers a solution for a highly reliable connection method for magnet wire. It eliminates welding, no longer requires removal of insulation, and it can be installed in seconds. No special operator skills are needed. The connector and matching tooling do the entire job. To meet the essential requirements of magnet wire connections, T&B offers the insulation piercing Dragon Tooth® compression connector.



Transformer manufacturers depend on Dragon Tooth® connectors for reliable magnet wire applications.

Typical Applications



Dragon Tooth® Magnet Wire Connectors

Thomas & Betts Dragon Tooth® connectors and installing tools are designed to splice, tap, and terminate magnet wire from 32 AWG to 460,000 CMA copper and from 20 AWG to 460,000 CMA aluminum conductors in motor and transformer applications. Dragon Tooth® Magnet Wire Connectors penetrate the insulation and oxide layers to make electrical contact on magnet wiring. The result is permanent, low-resistance electrical connections, capable of maintaining contact integrity throughout the life of the connection.

- Designed to penetrate magnet wire insulation during application, eliminating the need for stripping, brazing, welding, or other methods of joining magnet wire
- Can be installed in seconds
- Requires minimal training for installation
- Made of copper alloy, tin plated, with teeth on the inner surface
- Splices and taps have an open side enabling easy access to wire and making internal coil tapping possible
- For aluminum to copper, aluminum to aluminum, or copper to copper magnet wire connections
- Supplied with bolt holes to accommodate No. 6 through 1/2" studs and includes male and female .250 x .032" disconnects
- Splices and fork terminals accommodate wire sizes 24 AWG to 12 AWG in a variety of combinations, including combining magnet wire with stripped wire lead. For solid or stranded wire #20 to #4/0 AWG
- Larger connectors accommodate circular mil range from 50,000 to 460,000 cm
- Connector and matching tooling do the entire job

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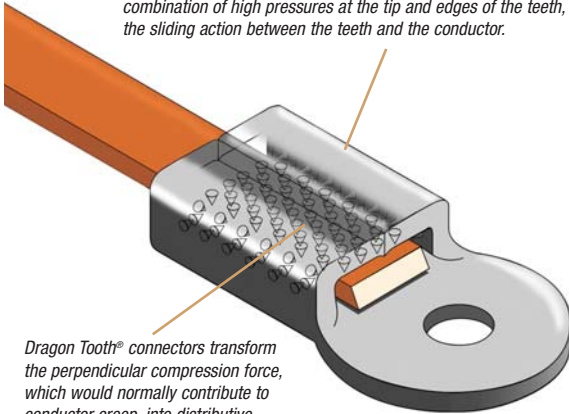
Tel: 888.862.3289

Overview

Dragon Tooth® connectors transform the perpendicular compression force, which would normally contribute to conductor creep, into distributive forces that effectively resist cold flow, as indicated by the illustration **below**.

These connectors are made of copper alloy, tin plated, with a number of teeth on the inner surface. When compressed onto an insulated magnet wire, the sharp, hardened teeth penetrate both the insulation and oxide and bite into the conductor. An electrically sound, low-resistance connection is established as a result of the combination of high pressures at the edges of the teeth, and the sliding action between the teeth and the conductor. The open barrel design permits midspan splicing and tapping.

These connectors are made of copper alloy, tin plated, with a number of teeth on the inner surface. When the connector is compressed onto an insulated magnet wire, the sharp, hardened teeth penetrate the insulation and the oxide and bite into the conductor. An electrically sound, low-resistance connection is established as a result of the combination of high pressures at the tip and edges of the teeth, and the sliding action between the teeth and the conductor.



Dragon Tooth® connectors transform the perpendicular compression force, which would normally contribute to conductor creep, into distributive forces that effectively resist cold flow.

For wire sizes and combinations other than shown, contact Thomas & Betts Technical Services at 800-888-0211, ext. 8324.

Formula for Calculating Circular Mil Area (CMA)

For square or rectangular wire:

$$\text{Thickness} \times \text{Width} \times 1.273 \times 10^6 = \text{CMA}$$

For round wire:

$$\text{Diameter}^2 \times 10^6 = \text{CMA}$$

(or see chart on p. K-8)



How to Select a Connector

- 1 Determine total circular mil area (CMA). All wires to be installed in a connector barrel including stripped, stranded wire. For example, two #6 AWG = 52480CMA.
- 2 Refer to Circular Mil column of chart and find the connector series corresponding to the total CMA. For example, 204XXX.
- 3 Next, refer to either Round Wire column or Rectangular Wire column, depending on the type you are using, and check for any limitations, (such as max. wire width/height). If there are limitations, you may have to make a selection from the next larger size.
- 4 Select the tool and die appropriate for the application.



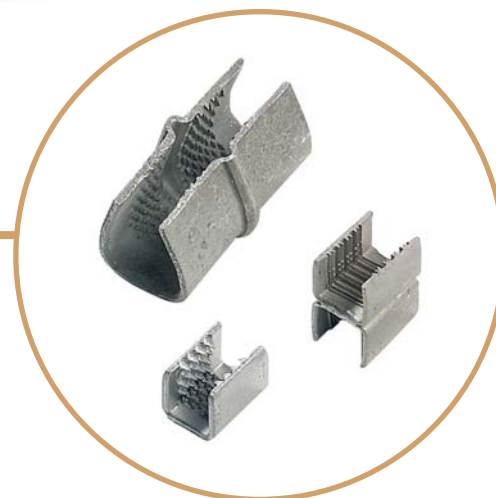
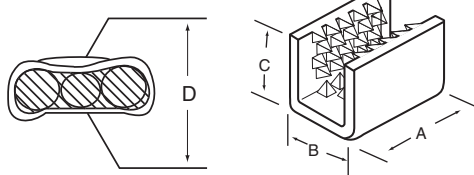
Dragon Tooth®

Insulating Piercing Connectors

Splices for copper and aluminum magnet wire!

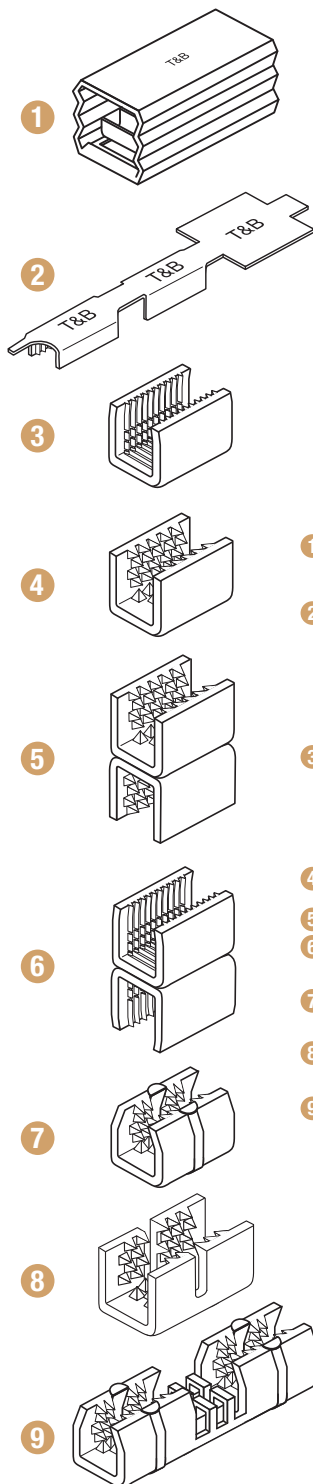
Splices

- Penetrate all standard copper and aluminum magnet wire insulations
- Perfect for heavy Formvar, poly-thermaleze, polyester, and polyurethane insulations



For special insulations, consult Technical Services.

Dragon Tooth® Insulation Piercing Connectors



CAT NO.	DIMENSIONS (IN.)				CIRCULAR MIL AREA	ROUND WIRE RANGE (AWG)		RECTANGULAR WIRE RANGE (IN.)		PKG. QTY.
	A	B	C	D*		MIN.	MAX.	THICKNESS	WIDTH	
1 214420	.43	.25	.22	.135	—	21 (4)	13 (2)	—	—	1000
220004	.17	.11	.08	.03	468 – 1,724	32	24**	—	—	†8400†
220001	.34	.17	.14	.09	1,277 – 4,205	26	17**	.02 - .04	.02 - .09	†3000†
2 220002-TB	.34	.25	.18	.09	2,985 – 6,687	24	14**	.02 - .05	.02 - .10	†3000†
220006	.47	.25	.19	.09	5,162 – 12,330	16	12	.05 - .08	.05 - .16	†2500†
22L004	.15	.11	.09	.03	128 – 2,028	32	24**	—	—	1000
22L001	.32	.16	.16	.10	808 – 5,162	26	17**	.02 - .04	.02 - .10	1000
22L002	.32	.25	.19	.10	2,048 – 9,110	24	15**	.02 - .05	.02 - .11	1000
3 22L006	.44	.25	.22	.13	2,580 – 12,330	16	12	.05 - .08	.05 - .16	1000
22L008	.70	.50	.35	.13	12,960 – 30,550	18	14	.04 - .06	.06 - .38	100
22L009	.70	.55	.46	.20	36,120 – 86,000	16	5	.08 - .18	.08 - .38	100
22L010	.70	.78	.71	.22	69,750 – 173,090 (f)	—	—	.10 - .23 (g), .10 - .18 (h)	.30 - .63	—
4 210214S	.63	.38	.37	.17	4,110 – 20,760	14(a)	10	.08 - .09	.08 - .18	250
204210S	.69	.53	.53	.25	10,380 – 52,480	12(b)	4(e)	.10 - .16	.10 - .26	100
5 204210SH	.69	.53	1.05	.48	20,760 – 104,960	12(c)	2(d)	.10 - .16	.10 - .26	100
6 22L009H	.70	.55	.93	.37	72,000 – 132,000	16	5	.08 - .18	.08 - .38	100
220015	1.50	.88	.77	(e)	50,000 – 115,000	10	6	.100 - .175	.300 - .625	50
7 220019	1.50	.88	.85	(e)	110,000 – 175,000	6	2	.175 - .250	.300 - .625	25
220023	1.75	.88	.93	(e)	165,000 – 230,000	2	1/0	.250 - .325	.300 - .625	25
8 314118S	.63	.38	.30	.14	3,260 – 12,330	15	13	.05 - .06	.05 - .18	250
220016	3.13	.88	.77	(e)	50,000 – 115,000	10	6	.100 - .175	.300 - .625	25
9 220020	3.13	.88	.85	(e)	110,000 – 175,000	6	2	.175 - .250	.300 - .625	25
220024	3.63	.88	.93	(e)	165,000 – 230,000	2	1/0	.250 - .325	.300 - .625	25

*Reference dimension. See installing die illustration for gauging.

** Not recommended for aluminum magnet wire finer than 21 gauge. (a) Four wires max. (b) Six wires max. (c) Six wires max. each barrel (d) Conductors heavier than 6 AWG require special dies. Contact Thomas & Betts for assistance.

(e) Crimping dies may not bottom. Connector height will depend on number and size of wires in barrel. Pump must deliver 9800 psi minimum. (f) Copper CMA, aluminum CMA=52,136–124,561.

† On a reel

(a) This space may be used for terminal tongue insert, stripped stranded copper wire, stripped copper magnet wire, or left empty.

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.

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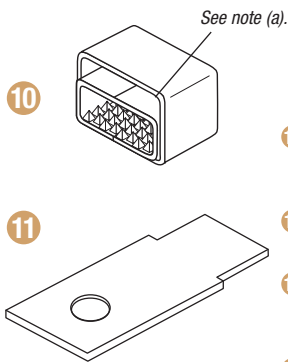
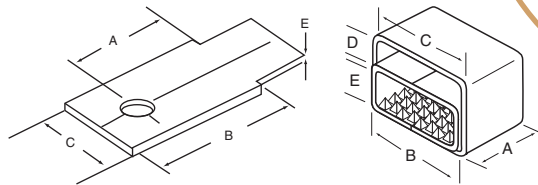
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Dragon Tooth®

Insulating Piercing Connectors

Splices (continued)



CAT. NO.	STUD SIZE	DIMENSIONS (IN.)					CIRCULAR MIL AREA	ROUND WIRE RANGE (AWG)	RECTANGULAR WIRE RANGE (IN.)		PKG. QTY.
		A	B	C	D	E			THICKNESS	WIDTH	
10 210214MT	—	.63	.63	.75	.25	.19	20,000 – 105,000	5 - 13	Lower Half .08 - .15 Upper Half .25 max	.08 - .49 .75 max.	250
11 210MT14	1/4	1.00	1.44	.81	—	.08		5 - 13	For Conn		25
11 210MT38	3/8	1.00	1.44	.81	—	.08		5 - 13	210214MT		25
10 204210MT	—	.69	.94	1.03	.25	.25	90,000 – 215,000	3 - 10	Lower Half .10 - .25 Upper Half .25 max	.10 - .92 1.03 max.	100
11 204MT14	1/4	1.00	1.44	.91	—	.10		3 - 10	For Conn		25
11 204MT38	3/8	1.00	1.44	.91	—	.10		3 - 10	204210MT		25

(a) This space may be used for terminal tongue insert, stripped stranded copper wire, stripped copper magnet wire, or left empty.

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.



Dragon Tooth® Insulating Piercing Connectors

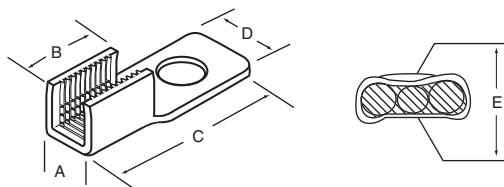
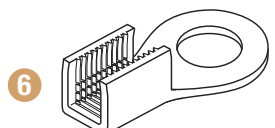
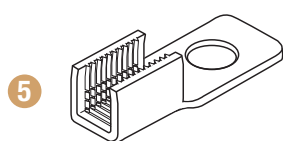
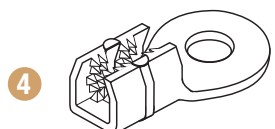
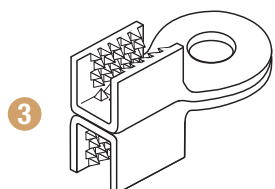
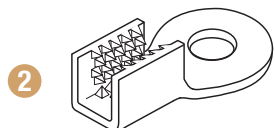
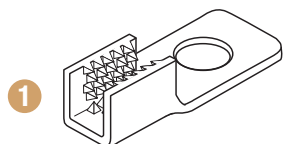
Dragon Tooth®

Insulating Piercing Connectors

Secure connections easily!

Dragon Tooth® Insulation Piercing Connectors

Ring Terminals



CAT. NO.	STUD SIZE	DIMENSIONS (IN.)					CIRCULAR MIL AREA	ROUND WIRE RANGE (AWG)	RECTANGULAR WIRE RANGE (IN.)		PKG. QTY.
		A	B	C	D	E*			THICKNESS	WIDTH	
314125	10	.38	.56	1.22	.41	.14	3,260 - 12,330	15 - 13	.05 - .06	.05 - .18	250
314123	1/4"	.38	.56	1.41	.41	.14	3,260 - 12,330	15 - 13	.05 - .06	.05 - .18	250
210219	8	.38	.56	1.22	.41	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
210217	10	.38	.56	1.22	.41	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
210216	1/4"	.38	.56	1.41	.41	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
204217	10	.53	.61	1.58	.50	.25	10,380 - 52,480	12(b) - 4(c)	.10 - .16	.10 - .26	100
204212	1/4"	.53	.61	1.58	.50	.25	10,380 - 52,480	12(b) - 4(c)	.10 - .16	.10 - .26	100
210214-1	1/4"	.38	.56	1.41	.69	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
210214-2	3/8"	.38	.56	1.41	.69	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
210214-3	3/8"	.38	.56	1.41	.69	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
204210-1	1/4"	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 4(c)	.10 - .16	.10 - .26	100
204210-2	3/8"	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 4(c)	.10 - .16	.10 - .26	100
204210-3	3/8"	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 4(c)	.10 - .16	.10 - .26	100
204210-5	1/2"	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 4(c)	.10 - .16	.10 - .26	100
204210-1H	1/4"	.53	.61	1.58	.81	.47	20,760 - 104,960	12(b) - 4(c)	.10 - .16	.10 - .26	100
204210-3H	3/8"	.53	.61	1.58	.81	.47	20,760 - 104,960	12(b) - 4(c)	.10 - .16	.10 - .26	100
220017	3/8"	.88	1.50	2.76	1.06	(d)	50,000 - 115,000	.100 - .175	-	.300 - .625	25
220018	1/2"	.88	1.50	2.76	1.06	(d)	50,000 - 115,000	.100 - .175	-	.300 - .625	25
220021	3/8"	.88	1.50	2.76	1.06	(d)	110,000 - 175,000	-	.175 - .250	.300 - .625	25
220022	1/2"	.88	1.50	2.76	1.06	(d)	110,000 - 175,000	-	.175 - .250	.300 - .625	25
220025	3/8"	.88	1.50	2.76	1.06	(d)	110,000 - 230,000	-	.175 - .325	.300 - .625	25
220026	1/2"	.88	1.50	2.76	1.06	(d)	110,000 - 230,000	-	.175 - .325	.300 - .625	25
22R061**	6	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22R081**	8	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22R101**	10	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22R086	8	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
22R106	10	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
22R146	1/4"	.25	.45	.95	.42	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
22L010*											

*Reference dimension. See installing die illustration for gauging. (a) Four wires max. (b) Six wires max. (c) Conductors heavier than 6 AWG require special dies. Contact Thomas & Betts for assistance. (d) Crimping dies may not bottom. Connector height will depend on number and size of wires in barrel. Pump must deliver 9800 psi minimum.

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.

**22-24 AWG and equivalent rectangular c.m.a., copper only.

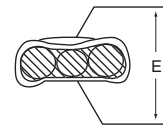
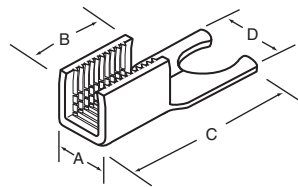
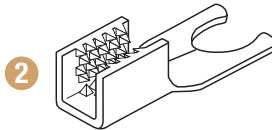
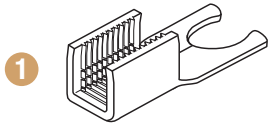
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Connectors for every application!

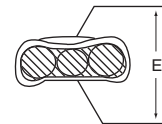
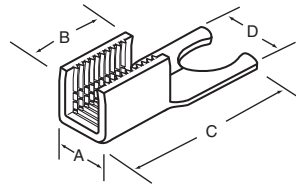
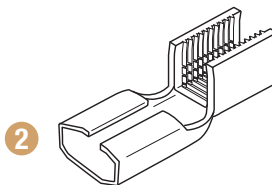
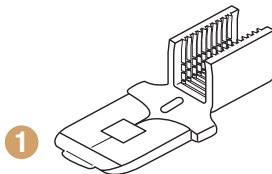
Fork Terminals



CAT. NO.	STUD SIZE	DIMENSIONS (IN.)					CIRCULAR MIL AREA	ROUND WIRE RANGE (AWG)	RECTANGULAR WIRE RANGE (IN.)		PKG. QTY.
		A	B	C	D	E*			THICKNESS	WIDTH	
22F061**	6	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22F081**	8	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22F101**	10	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22F066	6	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
22F086	8	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
22F106	10	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
210219F	6	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
210217F	8	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
210216F	10	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000

Durable and convenient!

Disconnects



CAT. NO.	TAB SIZE	DIMENSIONS (IN.)					CIRCULAR MIL AREA	ROUND WIRE RANGE (AWG)	RECTANGULAR WIRE RANGE (IN.)		PKG. QTY.
		A	B	C	D	E*			THICKNESS	WIDTH	
22LM01**	.250 x .032	.16	.32	.76	.25	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22LM06	.250 x .032	.25	.45	.91	.25	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
22LF01**	.250 x .032	.16	.32	.79	.25	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
22LF06	.250 x .032	.25	.45	.91	.25	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000

*Reference dimension. See installing die illustration for gauging. (a) Four wires max. (b) Six wires max. (c) Conductors heavier than 6 AWG require special dies. Contact Thomas & Betts for assistance. (d) Crimping dies may not bottom. Connector height will depend on number and size of wires in barrel.

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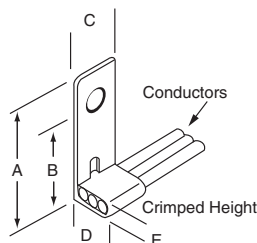
**22-24 AWG and equivalent rectangular c.m.a., copper only.

Dragon Tooth®

Insulating Piercing Connectors

Quick and easy connections!

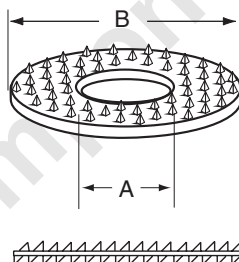
Taps



CAT. NO.	STUD SIZE (IN.)	DIMENSIONS (IN.)					CIRCULAR MIL AREA	RECTANGULAR WIRE RANGE (IN.)		PKG. QTY.
		A	B	C	D	E*		THICKNESS	WIDTH	
204T14	¼	1.62	1.22	.70	.50	.22	10,310 - 52,480	.090 - .114	.090 - .320	100
204T38	⅜	1.62	1.22	.70	.50	.22	10,310 - 52,480	.090 - .114	.090 - .320	100

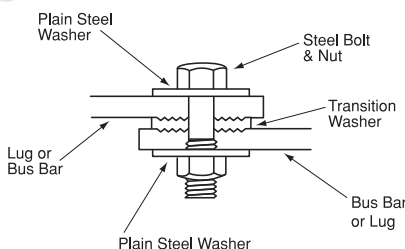
*Reference dimension. See installing die illustration for gauging.

Copper to aluminum connections!



Washers

- Teeth on the transition washers penetrate aluminum and copper oxides
- Enables copper to aluminum connections to be made in a bolted joint without the use of inhibiting compounds
- Accommodates the difference in thermal expansion between copper and aluminum, and enhances the efficiency of bolted grounding connections



CAT. NO.	BOLT SIZE, (IN.)	DIMENSIONS (IN.)		RECOMMENDED INSTALLING TORQUE IN-LBS.	PKG. QTY.
		A	B		
FPW14	¼	.27	.68	50 - 80	250
FPW516	⅜	.34	1.00	125 - 160	250
FPW38	⅜	.43	1.00	160 - 240	250
FPW12	½	.56	1.25	390 - 540	250
FPW58	⅝	.68	1.40	540 - 730	250

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.

Additional Magnet Wire Ordering Information

- For wire sizes and combinations other than shown, consult factory.
- Maximum of two layers of conductors in each connector.
- Consult factory for gauging other than shown.
- When terminating wires with an AWG size difference of four or more, samples should be tested in completed connections before using.

Conversion of AWG to Circular Mils

WIRE SIZE AWG	NOM. DIAMETER IN.	DIAMETER MM	CIRCULAR MILS
4/0	.4600	11.68	211600
3/0	.4096	11.40	167800
2/0	.3648	9.266	133100
1/0	.3249	8.52	105600
1	.2893	7.348	83690
2	.2576	6.543	66360
3	.2294	5.827	52620
4	.2043	5.189	41740
5	.1819	4.620	33090
6	.1620	4.115	26240
7	.1443	3.665	20820
8	.1285	3.264	16510
9	.1144	2.906	13090
10	.1019	2.588	10380
11	.0907	2.30	8230
12	.0808	2.05	6530
13	.0720	1.83	5180
14	.0641	1.63	4110
15	.0571	1.45	3260
16	.0508	1.29	2580
17	.0453	1.15	2050
18	.0403	1.02	1620
19	.0359	0.912	1290
20	.032	.813	1020
21	.0285	.724	812
22	.0253	.643	640
23	.0226	.574	511
24	.0201	.511	404

Decimal Equivalents

WIRE SIZE AWG	NOM. DIAMETER IN.	DIAMETER MM	CIRCULAR MILS
1/64	.0156	3/16	.1875
1/32	.0312	13/64	.2031
3/64	.0469	7/32	.2188
1/16	.0625	15/64	.2344
5/64	.0784	1/4	.25
3/32	.0938	—	—
7/64	.1094	17/64	.2656
1/8	.125	9/32	.2812
9/64	.1406	19/64	.2969
5/32	.1562	5/16	.3125
11/64	.1719	21/64	.3281
11/32	.3438	33/64	.5156
23/64	.3594	17/32	.5312
3/8	.375	35/64	.5469
25/64	.3906	9/16	.5625
13/32	.4062	37/64	.5781
27/64	.4219	19/32	.5938
7/16	.4375	39/64	.6094
29/64	.4531	5/8	.625
15/32	.4688	41/64	.6406
31/64	.4844	21/32	.6562
1/2	.5	43/64	.6719

NOTE: Multiply inches x 25.4 to get millimeters.
Example: 0.5" x 25.4 = 12.7 mm.

STUD SIZE	#6	#8	#10	1/4"	5/16"	3/8"	1/2"
Hole Dia.	.143	.169	.196	.260	.323	.386	.516

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Crimp with comfort!

Ergonomic Manual Installation Tools

- Fixed die tool
- Incorporates the ergonomically designed Comfort Crimp® tool handles, which distribute the force more evenly across the hand
- Shure-Stake® mechanism ensures a complete crimp cycle before the tool releases
- Rubberised thermoplastic handles combine maximum friction with a soft, comfortable feel that reduces muscle tension
- Two-piece movable die nest provides easy connector removal (ERG811 has single die nest)



Dragon Tooth® Insulation Piercing Connectors

T&B TOOL WARRANTY

You can choose Thomas & Betts tools with confidence, because we stand behind them with our warranty.

See page **B-101** for additional warranty information.

1 Year

- Cable Tie Installation Tools
- Printers
- Cable Cutters & Strippers
- Dies

2 Years

- Mechanical Hand Tools with Shure-Stake® Mechanism
- Pneumatic Tools
- Hydraulic Pumps
- Battery-Operated Tools

5 Years

- Mechanical Hand Tools without Shure-Stake® Mechanism
- Hydraulic Tools (self-contained and remote heads)

CAT. NO.	TOOL GAUGING	CONNECTOR	PKG. QTY.
ERG1801	.069 max.	22F, L, R-1 Series	1
ERG1802	.076 max.	22L002	1
ERG1804	.034 max.	22L004	1
ERG1806	.095 max.	22F, L, R-6 Series	1
ERG811	.103 max.	214420	1

Contact Customer Services for availability and most recent additions to the ergonomic tool series.

Dragon Tooth®

Battery-Powered Crimping Tools

1½ tons of grip that weighs less than three pounds!

Battery-Powered Crimping Tool — BAT22-6

T&B's newest battery-powered tool is fast and portable for making high-volume and difficult-to-reach terminal installations in a snap. The BAT22-6 delivers 1.5 tons of crimping force with an easy, pushbutton trigger. The lightweight, ergonomic design minimizes the risk of repetitive motion injuries that can occur with traditional hand crimping tools. And at less than three pounds, one-hand operation is easy while still packing enough power to crimp up to 6 AWG terminals in seconds.

- Interchangeable dies can be quickly changed to crimp non-insulated and insulated terminals up to 6 AWG
- Dies are the same as our hand tools—crimps will be exactly the same between Sta-Kon® hand tools such as our ERG-2001 and the new BAT22-6
- 360° rotating head gives the user the added flexibility when crimping hard-to-reach connections
- Short cycle time equates to crimping times of less than two seconds
- Quick, lightweight, and maneuverable
- NiCd battery operation provides long-lasting battery life to complete up to 150 crimps on a single charge
- Extra battery and charger are included with the tool, ensuring round-the-clock operation
- Battery charger provides full battery life in under an hour
- Linear crimping motion gives a symmetric, high-quality crimp every time

Easy to rotate with your wrist—delivers fast and effective crimping power.



Uses the exact dies of the Comfort Crimp line of ergonomic tools for Sta-Kon, Spec-Kon, and Dragon Tooth.

Specifications

Crimping Force — 2,900 lbs. max.

Crimps per Charge — 150

Wire Crimping Range —
Up to 6 AWG

Dimensions —
25.4" (645 mm) Length
3.1" (79 mm) Width
2.1" (53 mm) Height

Crimp Cycle Time — 2 seconds

Power Supply — 9.6V NiCd
battery

Tool Weight (With Battery) —
2½ lbs.

Recharging Time — 1 hour

Included Accessories

- Sturdy, plastic carrying case for portability
- Two 9.6V NiCd batteries and battery charger
- Sturdy tray for convenient storage of crimp dies

CAT. NO.	DESCRIPTION	PKG. QTY.
BAT22-6	Battery Crimping Tool 1.5 Ton with 120 VAC Charger	1
Crimp Dies*		
DIE1801	22 F,L,R-1 Series	1
DIE1802	22L002	1
DIE1804	22L004	1
DIE1806	22 F,L,R-6 Series	1

Tool purchase includes crimping tool, two 9V batteries, charger, and case.

*Dies sold separately.

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Perfect for high-speed installation!

BAIR22-6 — Heavy-Duty Bench-Top Air Crimp Tool

- Bench mounted for stability and operator control
- Compact size, all-metallic construction
- Delivers 1.8 tons of crimping force at 100 psi
- Heavy-duty and installs wide range of Dragon Tooth connectors

..... Specifications

Height — 12"
Operating Pressure — 85–100 psi
Base — 8" Square
Weight — 17 lbs.



BAIR22-6

CAT. NO.	DESCRIPTION
BAIR22-6	Equipped with Shure-Stake® Mechanism, Ensuring Full Crimp Cycle Before Release

Pneumatic power!

PAIR22-6 — Heavy-Duty Portable Air Crimp Tool

- Installs Dragon Tooth® terminals
- Hand actuated
- Delivers 1.25 tons of crimping force at 100 psi
- 3 interchangeable dies can crimp the 22xxx1, 22xxx2, and 22xxx6 series terminals

PAIR 22-6



..... Specifications

Overall Length — 14" **Operating Pressure** — 90–100 psi
Diameter — 2 1/4" **Weight** — 2.5 lbs.

CAT. NO.	DESCRIPTION
PAIR22-6	Open "C" Yoke; Hand Actuated

Installing Dies for BAIR22-6 and PAIR22-6

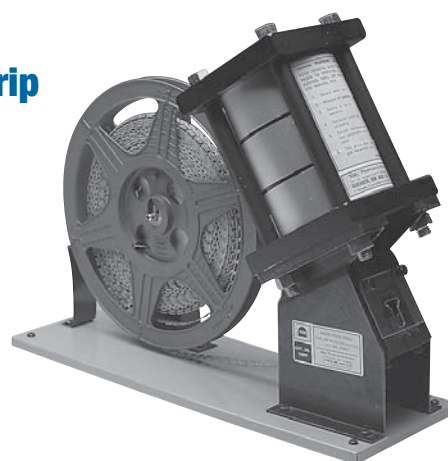
CAT. NO.	DESCRIPTION	PKG. QTY.
Crimp Dies*		
DIE1801	22 F,L,R-1 Series	1
DIE1802	22L002	1
DIE1804	22L004	1
DIE1806	22 F,L,R-6 Series	1

Continuous reel crimping!

Auto-Feed Tool for Magnet Wire Connectors on Strip

- Foot pedal contains T&B Shure-Stake® control mechanism, which ensures a full compression each time
- Includes foot valve, hoses, and air treatment system
- Insulation piercing connectors are fed on a continuous reel-mounted strip
- Pneumatic bench-mounted foot-operated tool for crimping copper or aluminum magnet wire and copper lead wire, not solder dipped or bonded
- Dies are self-contained

CAT. NO.	CONNECTOR	QUANTITY PER REEL	WEIGHT	WIDTH	DEPTH	HEIGHT
13676A	220004	9,000	19 lbs.	5"	14"	11"
13678	220001	3,000	28 lbs.	6"	18"	14"
13679	220002	3,000	28 lbs.	6"	18"	14"
13696	220006	2,500	32 lbs.	6"	18"	16"



Dragon Tooth®

Air Hydraulic Tools

Rugged and portable!

6-Ton Hydraulic Head

- Lightweight design—weighs less than 7 lbs. including dies
- Includes steel carrying case

Specifications

Output Force — 6 tons nominal

Operating Pressure — 10,000 psi nominal (safety bypass on pump set at 9800 psi)

Tool Weight — 6½ lbs. (without dies)

Tool Dimensions — 13½" long, 3½" wide

- Tool carrying case included
- Dies are ordered as a set (2 pieces)
- Upper and lower dies are identical



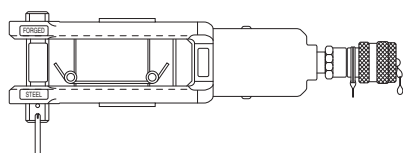
CAT. NO.	DESCRIPTION
TBM6H	The TBM6H Remote Hydraulic Crimping Head is a lightweight but powerful compression tool. The TBM6H operates from any 10,000 psi hydraulic pump.

See die chart on **page K-14** for complete listing of dies and connectors used with TBM6H.

Powerful and reliable!

12-Ton Hydraulic Head

- 12 tons output (nominal)
- 10,000 psi max. hydraulic operating pressure
- Weighs 15 lbs.



Specifications

Output — 12 tons (nominal)

Hydraulic Operating Pressure — 10,000 psi (max.)

Length (with coupling) — 14½"

Width — 3¼"

Weight (without dies) — 15 lbs.

CAT. NO.	DESCRIPTION	PKG. QTY.
13400	12-Ton Hydraulic Head (Dies Ordered Separately)	1

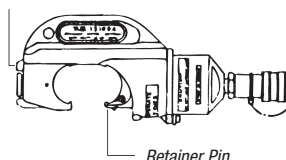
See die chart on **page K-14** for complete listing of dies and connectors used with 13400.

Lightweight design!

14-Ton Hydraulic Head

- 14 tons output (nominal)
- 10,000 psi max. hydraulic operating pressure
- Weighs 10 lbs.

Die Release Knob



Retainer Pin



Specifications

Output — 14 tons (nominal)

Hydraulic Operating Pressure — 10,000 psi (max.)

Length (With Coupling) — 11½"

Width — 2½"

Height — 4¼"

Piston Diameter — 1.812"

Piston Stroke — 1.5" max.

Weight (Without Dies) — 10 lbs.

CAT. NO.	DESCRIPTION	PKG. QTY.
13100A	Remote 14-Ton Hydraulic Head (Dies Ordered Separately)	1

See die chart on **page K-14** for complete listing of dies and connectors used with 13100A.

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Crimp larger connectors easily!

15-Ton Hydraulic Head

- Longer, slimmer profile enables easier access into tight spaces
- Wider jaw opening eases crimping of larger connectors
- Head made of forged steel and insulated with rubber boot
- Steel carrying case is included
- Longer, slimmer profile enables easier access into tight spaces

Specifications

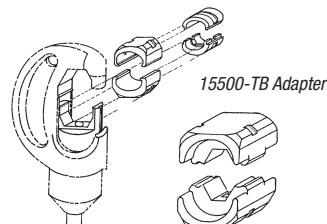
Output Force — 15 tons nominal

Operating Pressure — 10,000 psi nominal

Cylinder — 2" dia.

Tool Weight — 16½ lbs. (without dies)

Installs — 8 AWG – 1500 MCM Copper; 10 AWG – 1000 MCM Aluminum



CAT. NO.	DESCRIPTION	PKG. QTY
TBM15I	Insulated 15-Ton Hydraulic Tool; Carrying Case Included	1

See die chart on **page K-14** for complete listing of dies and connectors used with TBM15I.

Electric Hydraulic Pump

- Up to 10,000 psi output pressure
- Durable construction
- Hand or foot actuated



13810



13610A

CAT. NO.	DESCRIPTION
13810	Electric hydraulic pump, 10000 psi with Shure-Stake mechanism feature; this is a heavy-duty OEM pump with high flow rate; 115V, 60Hz, 1½ HP, 23A; requires hand or foot control.

You may also need...

13611	Hand Switch for 13810
13612	Foot Switch for 13810
13613	High Pressure, Steel Reinforced Hydraulic Hose; 6 ft.
13614	High Pressure, Steel Reinforced Hydraulic Hose; 10 ft.
13619	High Pressure, Plastic Hydraulic Hose; 10 ft.

13600 This electric hydraulic pump is for use with all T&B hydraulic heads—consists of pump with pressure gauge and Pioneer type male coupler; add suffix **WG** to eliminate gauge; output pressure 9800 psi; order switch and hose separately.

You may also need...

13620	Hand Switch—10 ft.
13589A	Foot Switch—10 ft.
13619	10-ft. Non-Metallic Hose
13618	20-ft. Non-Metallic Hose

A remote control switch is required. Order Cat. No. 13620 for hand operation or Cat. No. 13589A for foot operation.

All pumps are supplied with a metal carrying case.

13610A Shure-Stake® electric hydraulic pump has same features as 13600, but includes the Shure-Stake® control mechanism; prevents under crimping; (pump pressure must reach 9,800 psi before recycling); requires hand or foot control; order switch and hose separately.

You may also need...

13611	Hand Switch—10 ft.
13612	Foot Switch—10 ft.
13797	In-line hydraulic pressure inspection gauge with male and female pioneer-type coupler.

A remote control switch is required to operate this unit. Use either a #13611 (hand) or #13612 (foot) switch.

Dragon Tooth®

Cross Reference

An easy-to-use reference guide for tools and connectors!

Dragon Tooth® Insulation Piercing Connectors

CONNECTOR	MANUAL	BATT 22-6, BAIR 22-6, PAIR 22-6	AUTOFEED TOOL FOR STRIP	TBM6H	13100A	13400	TBM15I
			DIES				
204210MT	-	-	-	-	-	13682	-
204210S	-	-	-	-	13671B	13671A	13671B with 15500TB
204210SH	-	-	-	-	13673B	13673	13673B with 15500TB
204210-1	-	-	-	-	13671B	13671A	13671B with 15500TB
204210-1H	-	-	-	-	13673B	13673	13673B with 15500TB
204210-2	-	-	-	-	13671B	13671A	13671B with 15500TB
204210-3	-	-	-	-	13671B	13671A	13671B with 15500TB
204210-3H	-	-	-	-	13673B	13673	13673B with 15500TB
204210-5	-	-	-	-	13671B	13671A	13671B with 15500TB
204212	-	-	-	-	13671B	13671	13671B with 15500TB
204217	-	-	-	-	13671B	13671A	13671B with 15500TB
204MT14	-	-	-	-	-	-	-
204MT38	-	-	-	-	-	-	-
204T14	-	-	-	-	13689B	-	13689B with 15500TB
204T38	-	-	-	-	13689B	-	13689B with 15500TB
210214MT	-	-	-	-	13681B	13681	13681B with 15500TB
210214S	-	-	-	-	13670B	13670A	13670B with 15500TB
210214-2	-	-	-	-	13670B	13670A	13670B with 15500TB
210214-3	-	-	-	-	13670B	13670A	13670B with 15500TB
210216, 210216F	-	-	-	-	13670B	13670A	13670B with 15500TB
210217, 210217F	-	-	-	-	13670B	13670A	13670B with 15500TB
210219, 210219F	-	-	-	-	13670B	13670A	13670B with 15500TB
210MT14	-	-	-	-	-	-	-
210MT38	-	-	-	-	-	-	-
214420	ERG811/WT811	DIE 811	-	-	-	-	-
220001	-	-	13678	-	-	-	-
220002-TB	-	-	13679	-	-	-	-
220004	-	-	13676A	-	-	-	-
220005	-	-	13690	-	-	-	-
220006	-	-	13696	-	-	-	-
220015	-	-	-	-	13713	-	13713
220016	-	-	-	-	13713	-	13713
220017	-	-	-	-	13713	-	13713
220018	-	-	-	-	13713	-	13713
220019	-	-	-	-	13713	-	13713
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220023	-	-	-	-	13713	-	13713
220024	-	-	-	-	13713	-	13713
220025	-	-	-	-	13713	-	13713
220026	-	-	-	-	13713	-	13713
22F061	ERG1801	DIE1801	-	-	-	-	-
22F066	ERG1806	DIE1806	-	-	-	-	-
22F081	ERG1801	DIE1801	-	-	-	-	-
22F086	ERG1806	DIE1806	-	-	-	-	-
22F101	ERG1801	DIE1801	-	-	-	-	-
22F106	ERG1806	DIE1806	-	-	-	-	-
22L001	ERG1801	DIE1801	-	-	-	-	-
22L002	ERG1802	DIE1802	-	-	-	-	-
22L004	ERG1804	DIE1804	-	-	-	-	-
22L006	ERG1806	DIE1806	-	-	-	-	-
22L008	-	-	-	6TON-MW-08	13683B	13683	13683B with 15500TB
22L009	-	-	-	6TON-MW-09	13684B	13684	13684B with 15500TB
22L009H	-	-	-	-	13686B	13686	13686B with 15500TB
22LF01	ERG1801	DIE1801	-	-	-	-	-
22LF06	ERG1806	DIE1806	-	-	-	-	-
22LM01	ERG1801	DIE1801	-	-	-	-	-
22LM06	ERG1806	DIE1806	-	-	-	-	-
22R061	ERG1801	DIE1801	-	-	-	-	-
22R106	ERG1806	DIE1806	-	-	-	-	-
22R146	ERG1806	DIE1806	-	-	-	-	-
314118S	-	-	-	-	13685B	13685	13685B with 15500TB
314123	-	-	-	-	13685B	13685	13685B with 15500TB
314125	-	-	-	-	13685B	13685	13685B with 15500TB
22L010	-	-	-	-	13690B	-	-

NOTE: Dies that fit 13100A also work in TBM15 with use of adapter 15500TB.

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