



Creativity Quality Design Solutions

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How To Use The Tinnerman® Parts Catalog

This Tinnerman fastener catalog is designed to help solve your fastening problems quickly and efficiently. The "383" includes seven separate sections, each covering a category of Tinnerman fasteners for specific applications or assembly advantages. The catalog identifies each category with product illustrations and serves as an index for easy location and quick reference.

Once the category and type of fastener required have been determined, isolating the exact design is a simple matter of deduction. The basic or standard designs are shown in the dimensional drawings on each charted page. Major envelope dimensions are shown as variable call-out letters which appear in the column heads of the chart. The charts are organized as follows:

1	2	3	4	5
Column one, and usually column two, give the screw size, stud size, tube dia., panel range, etc., which are prime factors for selection and application.	Design Variations column indicates whether a part is standard (as drawn and specified "Std") or a modification of standard e.g., A, B, C, or ABC in combination. Such variations are identified and illustrated. Parts are available only as specified in the Design Variation column. Further modification requires special tooling and order processing.	The remaining columns chart the envelope dimensions such as length A, width B, edge of panel to mounting hole C, material thickness T. These call-out letters have been standardized to always represent the same dimension (e.g., A is always length). This makes it easier to discuss dimensions without confusion.	The last column, or extreme right hand, is the part number column. The full part number as shown should always be used. The dash numbers specify screw size, stud size, material thickness and are critical for proper identification.	Preferred finish is indicated by a second dash number. See pages 6 and 7 of this section for standard finish descriptions and proper call out.

Tinnerman® Fastener Samples

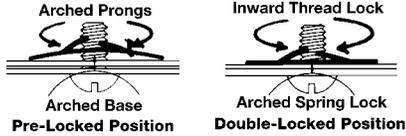
To assure you of proper fastener selection and for production line testing, we offer a complete sample service. Transparent zip-lock envelopes permit quick visual identity for easy reference. Large quantities for extensive production testing can be supplied on special request.

Your Eaton Representative...

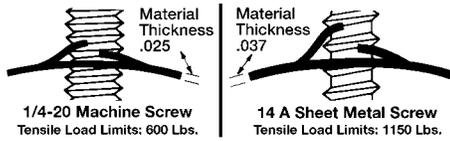
...whether a direct Eaton field representative or an Authorized Distributor fastening specialist, your representative is a carefully trained, highly qualified fastening expert who is ready to help you make the most of Eaton's Engineered Fastening service – and follow through to assure excellence in fastener selection and performance.



Tinnerman® Fastener Engineering Data



The Tinnerman® Principle of Spring Tension Fastening.



The greater the material thickness, the stronger the Tinnerman® fastener.

Tinnerman® fasteners are one-piece and self-locking. They provide an inward thread lock plus an arched spring lock which are energized as the screw tightens. The combined forces of this double-locking action resist vibration loosening...and are exclusive with Tinnerman spring steel fasteners.

While they provide a strong and reliable double-locking action with standard screws, even greater strength can be attained by increasing the material thickness of the fastener and using A- or B-type screws. The example illustrated nearly doubles tensile strength with only a 48% increase in material thickness.

Excessive small parts' handling can be drastically reduced through the use of the Tinnerman principle of spring tension fastening. Fully documented case histories prove that assembly savings of 30 to 80% have resulted from the following **inherent benefits**:

- easier handling, faster application
- elimination of lockwashers, spanner washers, and other loose pieces
- perform multiple functions
- self-retaining, self-locking
- no special tools, skills or equipment required
- will not "freeze" to threads or clog with paint
- ideal for service locations, reused indefinitely
- lock on unthreaded studs
- many types used without screw, stud or mounting hole.

Recommended Values For Peak Fastener Performance

Screw Size	Thrds. Per Inch	Max. Dia.	Root Dia.	Standard Max. Thick.	Clearance Hole Dia.	Installation Torque	Tensile Load Limit
2-56	56	.086	.063	.010	.109	*	*
2-A	32	.088	.061	.017	.109	*	*
2-B	32	.088	.064	.017	.109	*	*
4-36	36	.112	.080	.012	.125	3" lbs	100 lbs
4-40	40	.112	.080	.012	.125	3" lbs	100 lbs
4 A	24	.114	.083	.022	.125	9" lbs	300 lbs
4 B	24	.114	.086	.022	.125	9" lbs	300 lbs
6-32	32	.138	.099	.017	.156	5" lbs	150 lbs
6 A	18	.141	.102	.025	.156	11" lbs	400 lbs
6 B	20	.139	.104	.025	.156	11" lbs	400 lbs
8-32	32	.164	.125	.017	.187	7" lbs	250 lbs
8 A	15	.168	.123	.028	.187	17" lbs	600 lbs
8 B	18	.166	.122	.028	.187	17" lbs	600 lbs
10-24	24	.190	.138	.022	.218	12" lbs	350 lbs
10 A	12	.194	.133	.031	.218	31" lbs	800 lbs
10 B	16	.189	.141	.031	.218	31" lbs	800 lbs
12-24	24	.216	.164	.022	.250	12" lbs	350 lbs
12 A	11	.221	.162	.034	.250	34" lbs	900 lbs
1/4-20	20	.250	.188	.025	.281	30" lbs	600 lbs
14 A	10	.254	.185	.037	.281	48" lbs	1150 lbs
14 B	14	.246	.192	.037	.281	48" lbs	1150 lbs
5/16-18	18	.312	.243	.028	.343	30" lbs	1000 lbs
5/8 B	12	.315	.244	.044	.343	16" lbs	1200 lbs
5/8 ACME	10	.312	.232	.044	.343	19" lbs	2200 lbs
20 A	9	.333	.234	.044	.375	*	*
3/8 ACME	12	.375	.282	.060	.406	*	*
3/8 B	12	.380	.309	.060	.406	19" lbs	2500 lbs
24 A	9	.390	.291	.060	.421	*	*

*computed on application.

Average Torque And Tensile Values

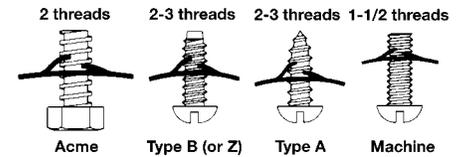
Tinnerman fasteners are tightened only enough to produce the **inward thread lock** and **arched spring lock** described above. They derive their locking characteristics, holding power and vibration resistance solely from spring tension. Unlike ordinary threaded nuts, they do not have to be tightened with a great amount of torque. In fact, any torque applied beyond the recommended installation torques charted above is excessive and could result in loss of spring tension resiliency.

The table shows the **average** amount of torque to use in tightening Tinnerman fasteners, plus the **average** tensile load limits. These averages

were determined through exhaustive testing. It is recommended that these values be followed. Averages were established as guides for general application. Consult your Eaton representative for torque and tensile data on special or specific parts.

Tests prove that Tinnerman fasteners will withstand greater tensile loads if the screw holes provide **minimum** clearance. We recommend the above screw clearance hole diameters. These do not apply to self-retaining fasteners, e.g. "U" or "J" types, where part of the fastener engages the mounting, or clearance hole.

Screw Lengths



The proper lengths of machine screws to use with Tinnerman fasteners are the same as for general practice, i.e., 1-1/2 thread protrusion beyond the threads (or prongs) of the fastener.

Since A- or B-type sheet metal screws taper at the end, longer screws must be used. Sheet metal screws **must** protrude 2 to 3 threads beyond the prongs to assure proper grip on the full root diameter of the screw.

Important—All Tinnerman fasteners shown in this catalog are of the Standard-Thread Fit Class unless otherwise specified!

Standard Fit: Tinnerman fasteners have a free-running fit on the screw threads for maximum speed in assembly. When the screw is tightened, the arch in the base diminishes, forcing the prongs inward and upward at the root of the threads and creating a high-resistance back-off torque.

Zip-on Fit: Tinnerman fasteners made with longer, more resilient prongs permit zipping the fastener over screw threads. Only one or two turns of the screw are necessary to tighten. Excellent for rapid assembly. Not recommended where heavy torque/tensile loads are applied.

Prevailing Torque Fit: Tinnerman fasteners are made to provide a restraining torque at any location on the screw threads. This fit is recommended when the fastener is used as an adjustment nut.



Standard Finishes For Tinnerman® Fasteners

Listed below are the most commonly used finishes available for protective coating and rust-proofing Tinnerman® Engineered Fasteners.

To specify desired finish, use corresponding dash number, shown below as the last dash number, affixed to the part number.

Examples: C183-012-**27**, C1053-012-**4**, C1158-5610-**1**

Finish	Description	Color	Advantages	Salt Spray Test
-27 Soluble Oil Dipped	Ferrous parts (except stainless steel) have a light coating of soluble oil applied. Non-ferrous parts are cleaned where necessary and are left in plain condition.	Natural.	Low-cost finish, recommended on ferrous parts for conditions of relatively little corrosion or for parts that are to receive a finish in the customer's plants.	5% solution at 95° F. Ferrous parts: first rust spots after 1 hour, end point (1/16" dia. rust spots) after 2-1/2 hours. Non-ferrous parts: corrosion will be normal for the plain finish of the material.
-4 Phosphate and Oil	Parts are phosphate coated, then dipped in a special oil and spun dry.	Black.	Moderate corrosion resistance. Neat in appearance — will not wear off in handling.	5% solution at 95° F. First rust spots after 32 hours. End point (1/16" dia. rust spots) after 48 hours.
-1 Phosphate and 2 Coats Olive Drab Paint	Parts are phosphate coated, then two coats olive drab paint are applied. Each coat is properly baked to obtain maximum protection.	Olive drab.	Good corrosion resistance. Does not cause hydrogen embrittlement common with electroplated high carbon spring steel. Excellent for insulating dissimilar metals against electrolytic action.	5% solution at 95° F. First rust spots after 48 hours. End point (1/16" dia. rust spots) after 96 hours.
-67 Phosphate and 2 Coats Aluminum Paint	Parts are phosphate coated, then two coats of aluminum paint are applied. Each coat is properly baked to insure maximum protection.	Aluminum color—smooth appearance.	Recommended in place of cadmium plating where appearance and corrosion resistance are requirements. High in abrasion resistance and a non-conductor of electricity.	5% solution at 95° F. First rust spots after 48 hours. End point (1/16" dia. rust spots) after 96 hours.
-373 Phosphate, 2 Coats of Paint and Oil	Parts are phosphate coated, then two coats of a bright green paint are applied. Each coat is properly baked. A supplementary coat of a special oil solution is added to insure the maximum corrosion resistance possible.	Bright green.	Exceptional corrosion resistance. Insulates dissimilar metals against electrolytic action. Does not cause hydrogen embrittlement.	5% solution at 95° F. First rust spots after 150 hours. End point (1/16" dia. rust spots) after 250 hours.
-963 Water based zinc coating Dacromat 320 or equivalent plus clear sealer	Parts are coated in a water based zinc coating for maximum protection.	Grey metallic.	Exceptional corrosion resistance. Does not cause hydrogen embrittlement.	5% solution at 95° F. End point (1/16" dia. rust spots) after 400 hours.
-252 Water based zinc coating plus water base organic black coating	Parts are water based zinc coated with the second coat being an organic finish.	Black.	Exceptional corrosion resistance. Does not cause hydrogen embrittlement.	5% solution at 95° F. End point (1/16" dia. rust spots) after 400 hours.

NOTE: The following electroplate finishes are limited to only a few parts, such as Tubular Type Clips and Tube Clamps.

Please do not specify these finishes for other types of Tinnerman Fasteners without the approval of our engineering department.

-600 Zinc Mechanical- plate	Parts are mechanically plated from .00015" to .0003" thick. A clear chromate is applied as a sealer.	Satin Silver color.	Excellent electrical conductivity and moderate corrosion resistance. No hydrogen embrittlement.	5% solution at 95° F. End point (red rust) after 24 hours.
-3 B Zinc Electroplate	Parts are zinc electroplated from .00015" to .0002" thick and baked to reduce hydrogen embrittlement.	Silver color. Slight discoloration from baking may occur.	Excellent electrical conductivity and moderate corrosion resistance.	5% solution at 95° F. End point (red rust) after 24 hours.



Assembly Finishes For Cushioned Clamps

Listed below are the standard finishes available for protective coating and rustproofing Tinnerman® cushioned clamps.

To specify desired finish, use corresponding dash number, shown below as the last dash number, affixed to the assembly number.

Examples: C 3046-11-89, C 3046-11-158

Type of Assembly Finish	Finish Dash Number and Description		
Electroplated Plus Extruded Neoprene* Flame-Resistant Cushion	Cadmium	-90	.00015-.0002 cadmium
		-91	.0003 cadmium
	Zinc	-168	.00015-.0002 zinc
		-158	.0003 zinc
		-188	.0003 zinc plus dichromate dip
Electroplated Plus Dipped Neoprene** Flame-Resistant Cushion	Cadmium	-93	.00015-.0002 cadmium plus dichromate dip
		-94	.0003 cadmium plus dichromate dip
	Zinc	-167	.00015-.0002 zinc plus dichromate dip
		-161	.0003 zinc plus dichromate dip
Painted Plus Extruded Neoprene* Flame-Resistant Cushion	-89	phosphate and two coats of olive drab paint	
	-179	phosphate and three coats of olive drab paint	
	-30	phosphate and two coats of gray paint	
Painted Plus Dipped Neoprene** Flame-Resistant Cushion	-16	phosphate and three coats of olive drab paint	
Plain Plus Extruded Neoprene* Flame-Resistant Cushion	-92	plain finish degreased (for aluminum clamps only)	
Plain Plus Dipped Neoprene** Flame-Resistant Cushion	-98	plain finish degreased (for aluminum clamps only)	
Anodized Plus Extruded Neoprene* Flame-Resistant Cushion	-35	anodize (sulphuric plus dichromate seal)	
Anodized Plus Dipped Neoprene** Flame-Resistant Cushion	-108	anodize (sulphuric plus dichromate seal)	
*Also Available, EDPM extruded cushion **Also available, PVC Plastisol dipped cushions.	NOTE: -1 finish is the <i>standard</i> finish for "U" and "J" Type fasteners attached to Tinnerman Clamps, Retainer Rings and Strips and is applied <i>before</i> assembly. Other finishes can be applied where required, but such cases will be considered as <i>specials</i> with a new finish number assigned to the assembly.		

Materials Guide For Plastic Fasteners

Plastic materials for Tinnerman Fasteners are selected for their most appropriate characteristics, such as temperature factors, flame resistance, impact strength, etc. All fasteners are designed for top quality performance whether for general use or specific application.

Material	Part Number Suffix	Tinnerman Fastener Usage													
		Flame Class	Expansion Type	Toggles & Clinch Types	Wallboard Toggle	Cap Nut	Poly-Clamp	Dart Type	Clamps & Ratchet Strap	Adhesive Clamps	Sleeves	Slide Seal	TPI Inserts	Screws	Special
ABS	-AE	SB													■
Acetal	-AG	SB						■							■
Nylon	-AA	SE	■	■			●	●	■		■			●	
Glass-Filled Nylon	-AC	SB													■
Polycarbonate	-AF	SE											■		
Polyethylene	-AB	SB				■	●					■			
Polypropylene	-AD	SB		●	■	●	■	●	■		■				
Rigid PVC	-AR	SE								■					

■ Standard Material ● Optional Material SB= Slow Burning SE= Self Extinguishing

ABS

A versatile engineering thermoplastic offering the best balance of properties of common rigid thermoplastic materials — good impact strength, good heat resistance, good low-temperature properties, excellent electrical properties, and fair-to-good chemical resistance. Plateable grades available.

ACETAL

An engineering thermoplastic that offers strength, rigidity, and good moisture, heat, and chemical resistance. Excellent abrasion resistance.

NYLON

Most common material for standard plastic fasteners. Structurally strong, nylon features low coefficient of friction, good insulating properties, resistance to heat (self-extinguishing), shock, vibration, and chemical solvents.

Light, elastic; has superior torque strength. Available glass filled or unfilled.

Material has temperature range of 40° to 250°F.

POLYCARBONATE

Most desirable balance of properties of any thermoplastic material available — excellent high and low temperature strength, good heat resistance (up to 250° F under load), high impact strength (in -275° to +250° F range), excellent dimensional stability, nontoxic, self-extinguishing, and excellent electrical insulation.

POLYETHYLENE

Low-cost, medium-strength material. Good insulator and has "rubber-like" characteristics. Can be used for

temperature applications up to 190° F.

POLYPROPYLENE

Lightest of the thermoplastics. Excellent chemical, heat, and electrical resistance properties. Is original "living" hinge material. Main disadvantage is low-temperature brittleness. Plateable grades available.

RIGID PVC (Polyvinyl Chloride)

Used for many special fastener applications. Exceptional resistance to acids, alkalis, and alcohols. Excellent in corrosive applications. Self extinguishing. Will not impart taste or color to materials



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

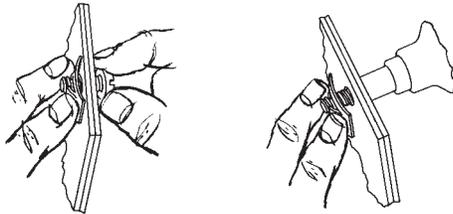
Metric parts listed in *italic*



Flat-Type Fasteners Rectangular

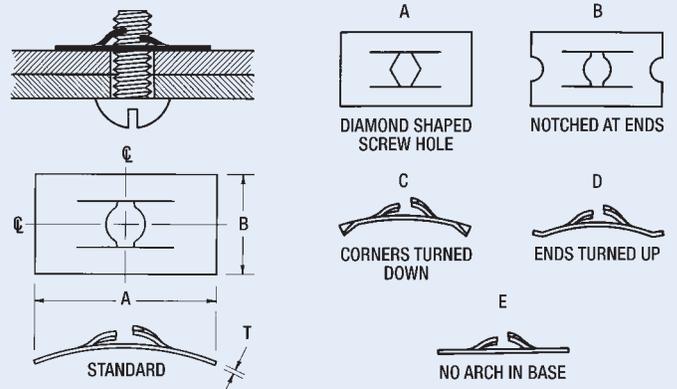
The **Flat-Type Speed Nut** is the basic design from which thousands of **Speed Nut Brand Fasteners** have been developed.

Flat-Type Speed Nut Fasteners are one-piece, self-locking, heat-treated, spring-steel fasteners that replace threaded nuts, lockwashers and spanner washers. On many applications, they eliminate time-consuming assembly operations. Fast and easy to apply, **Speed Nut Fasteners** provide maximum holding power at minimum cost per fastener. They never shake loose from vibration, yet can be easily loosened when desired, without worry about rust- frozen screw threads.



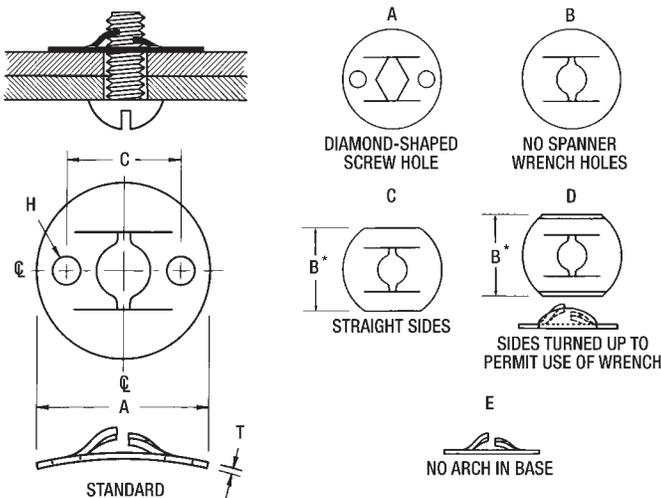
Hold **Speed Nut** in desired position with prongs pointing outward, toward fingers. Start screw through **Speed Nut** impression.

Press **Speed Nut** firmly against panel and drive screw. Finger pressure is sufficient to prevent **Speed Nut** turning as screw is driven.



Screw Size	Design Variation	A Length	B Width	T Material Thickness	Part Number
2-56	Std.	.380	.220	.010	C102-256
4-40	AC	.440	.250	.012	C1736-440
4A or 4B	Std.	.380	.250	.022	C7000-4
6-32	D	.510	.310	.017	C1181-632
6A or 6B	Std.	.870	.440	.025	C8000-6
8-32	Std.	.500	.310	.017	C7000-832
8A or 8B	Std.	.870	.470	.028	C8002-8
10-24	B	.730	.440	.022	C1150-1024
10A or 10B	Std.	.750	.500	.031	C7000-10
1/4-20	C	1.000	.560	.020	C8613-020
14A or 14B	Std.	.880	.560	.037	C7000-14
5/16-18	Std.	.980	.630	.028	C601-5618
3/8-16	A	1.000	.750	.034	C1297-3816
1/2-13	A	1.220	.880	.017	D7516-017*

Flat-Type Fasteners Round



Screw Size	Design Variation	A Diameter	B Width	C Center To Center	H Hole Diameter	T Material Thickness	Part Number
4B	BC	.380	.250	—	—	.022	C71046SS-4Z
6-32	BC	.380	.340	—	—	.017	C1000-632
8-32	BDE	.820	—	—	—	.017	C7868-832
8A or 8B	Std.	.500	—	.375	.062	.025	C944-8Z
10-24	Std.	.570	—	.415	.103	.025	C8642SS-1024
10-32	ABC	.570	.440	—	—	.017	C520-1032
10B	Std.	.570	—	.415	.103	.031	C171-10Z
M6X1.0	Std.	19.050	—	10.420	2.400	.430	C71530-M61*
1/4-20	BDE	.820	.640	—	—	.025	C166-1420
5/16-18	ABCE	.880	.690	—	—	.025	C15320-5618

* Zip-On Fit

Frequently Specified Fasteners **8** Thousands More Available!

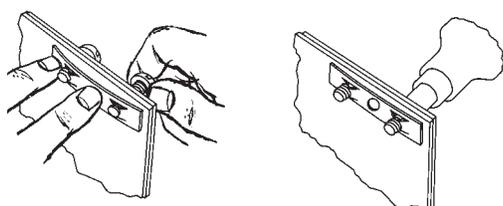
K&L Sales Inc . 1-800-284-5528 Fax @ 1-800-535-1526 e-mail sales@klsales.com

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze



Twin-Type Fasteners

Twin-Type Speed Nut Fasteners offer tremendous advantages over individual threaded nuts, lock and spanner washers on assemblies which have fastening locations in pairs. They are faster and easier to apply with only a single fastener to handle where four to six pieces are ordinarily required. Once the screws are started, the **Speed Nut** cannot turn, thereby eliminating the need for a wrench. This leaves both hands free to drive the screws into a properly locked position. Twin types are available in a wide range of screw sizes and center-to-center dimensions.

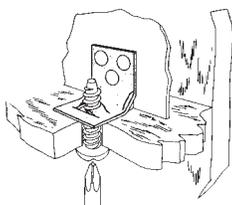


The **Twin-Type** is held in screw-receiving position and the screws are started by hand. No wrench is needed to hold the **Speed Nut** while the screws are driven tight. A center clearance hole is provided on some **Twin-Types** to allow the fastener to be riveted in screw-receiving position for blind location fastening.

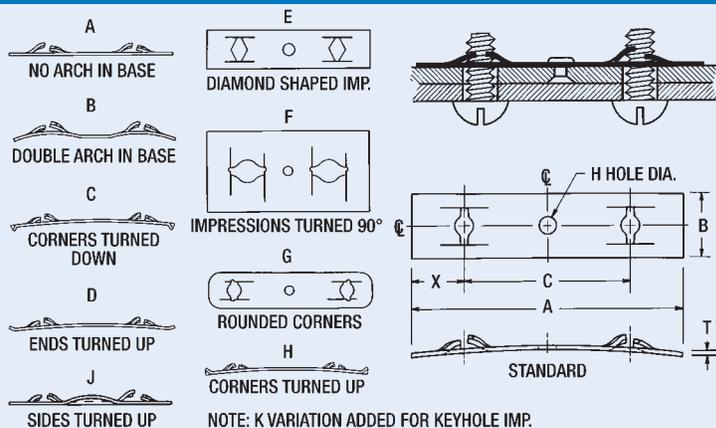


Angle Bracket Fasteners

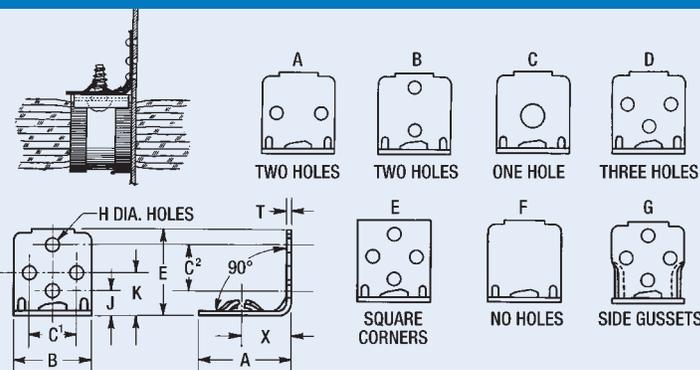
Angle Bracket Speed Nuts combine the conventional **Angle Bracket** with the **Speed Nut** Principle of Spring Tension Fastening to reduce the number of parts, speed assembly and provide structural strength. They are available in a wide variety of shapes and sizes and are applied in all industry from rugged construction to delicate electronics. Made from high quality heat-treated spring steel, they provide long life, reusability and resist vibration loosening, even under the severest conditions such as aircraft applications.



The assembly of **Angle Bracket Speed Nut** can be accomplished in several ways depending upon the nature of the assembly or the manufacturing facilities. They can be riveted, screwed, welded, latched, snapped or twist-locked into blind locations. They provide reliable fastening points at any desirable position on the panel, chassis, frame, bulk-head, etc.



C Center To Center	Screw Size	Design Variation	A Length	B Width	X Center To End	H Hole Dia.	T Material Thick.	Part Number
.188	2-56	AK	.500	.187	.156	—	.012	C53777-256
.380	4-40	Std.	.750	.310	.190	—	.012	C6704-440
.500	6-32	D	1.130	.380	.310	.105	.017	C6065-632
.750	8A or 8B	D	1.380	.380	.310	.105	.028	C8177-8
24.640	M3X0.5	AG	36.580	7.920	5.970	—	.250	C71262-M305
1.000	10A or 10B	D	1.630	.500	.310	.105	.031	C6069-10
1.500	1/4-20	B	2.380	.500	.440	—	.025	C385-1420
2.000	14A	A	2.880	.750	.440	—	.040	C16031-14A
3.000	14B	A	4.000	.560	.500	—	.037	C16063-14Z



Screw or Hole Size	De- sign Var.	A Lgth.	B Width	C1	C2	E Hgt.	H Dia.	J	K	X	T Mat'l Thick	Part Number
6B	C	.450	.310	—	—	.390	.136	.240	—	.250	.022	C19185-6Z
8-32	C	.450	.310	—	—	.390	.136	.240	—	.250	.020	C8706-832
8B	C	.745	.625	—	—	.745	.250	.375	—	.375	.028	C71731-8Z
	Std.	.740	.630	.375	.375	.740	.105	.250	.380	.380	.028	C6264-8Z
	F	.750	.630	—	—	.750	—	—	—	.380	.028	C8563-8Z
10A	CE	.850	.500	—	—	.800	.171	.490	—	.540	.031	C15344-10A

Tinnerman® Single Thread Engaging Self-Retaining Fasteners



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in italic



J-Type Fasteners

Tinnerman **J-Type Speed Nut** fasteners press easily into self-retained position over panel edges or in center-panel locations. They are ideally suited for blind assembly or hard-to-reach installation. Offer floating alignment to speed production and lessen rejections.

No special tools, skills or equipment is required. Riveting, welding, clinching, staking and other secondary fastening devices are eliminated.

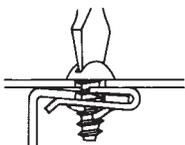
J-Type Speed Nuts can be applied after painting or porcelainizing panels eliminating the need for masking or retaping operations.

How to apply J-Type Fasteners

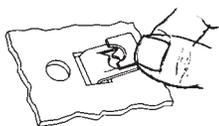


Start **J-Type Speed Nuts** over the edge of panel.

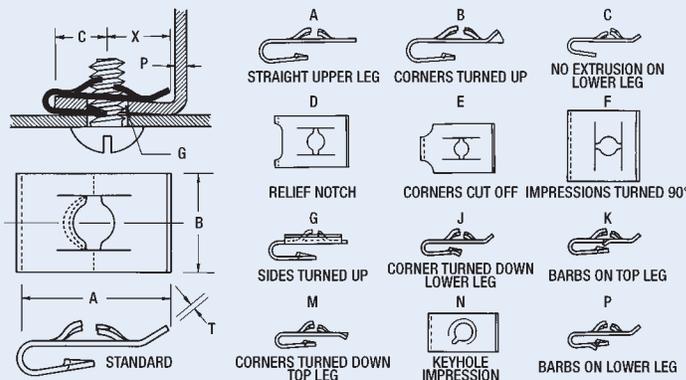
Push into position with thumb, snapping extrusion into hole. Short leg of **J-Type Speed Nuts** allows complete visibility of clearance hole while nut is being positioned.



Place second panel in position and drive the screw. Access to opposite side is unnecessary. Flush mounting can be attained by embossing either panel.



J-Type Speed Nuts can also be installed in center-panel locations through a rectangular hole as shown above. They are ideal for blind application and fastening.



Screw Size	Panel Range	Design Variation	P	A	B	C	X	G	T	Part Number
			Length	Width	Max. Hole to Edge	Ctr. to End	Panel Hole Dia.	Mat'l. Thick.		
4B	.020-.030	A	.380	.310	.171	.190	.194	.020		C6100-4Z
6-32	.041-.051	AF	.500	.500	.250	.210	.250	.017		C1397SS-632
<i>M4.7x1.59</i>	<i>2.50-2.50</i>	<i>N</i>	<i>14.100</i>	<i>12.700</i>	<i>7.130</i>	<i>6.400</i>	<i>8.530</i>	<i>.640</i>		<i>C71743-M47159</i>
8-32	.045-.062	ADFN	.520	.500	.234	.250	.218	.017		C8032SS-832
8A	.060-.070	Std.	.640	.440	.281	.300	.250	.028		C11418SS-8A
8A or 8B	.080-.105	ACF	.790	.630	.500	.250	.218	.028		C9248-8
10-24	.045-.062	AEN	.970	.380	.562	.350	.250	.022		C8048-1024
10A	.022-.040	ADFJM	.500	.560	.234	.240	.265	.031		C10419-10A
10A or 10B	.168-.198	DF	.570	.630	.281	.270	.250	.031		C14982-10
1/4-20	.040-.051	ADK	.910	.562	.375	.430	.312	.025		C19383-1420
14A or 14B	.168-.198	AE	.810	.560	.375	.350	.343	.034		C15128-14
14B	.028-.056	AE	.900	.560	.421	.400	.312	.037		C9731-14Z
5/16-10	.178-.194	A	1.070	.630	.562	.420	.500	.044		C7788-5610
5/16B	.032-.046	AEG	1.250	.700	.625	.580	.468	.044		C7799-56Z
5/16B	.088-.102	ACEKP	1.130	.625	.625	.448	.437	.044		C71570-56Z

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

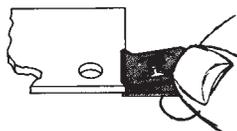


U-Type Fasteners

U-Type Speed Nuts perform the same fastening functions as the J-Type, but are used where a full bearing surface on the lower leg is desired. They are self-retained in screw-receiving position to provide simple, rapid attachment of mating panels and cannot turn as the screw is driven.

Corrosion presents no problem, as the **Speed Nut** will not freeze on screw threads. In fact, the **Speed Nut** impression actually cleans out rust, dirt or paint clots from the screw threads as they are removed.

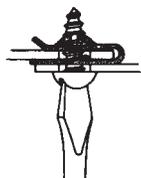
How to apply U-Type Fasteners



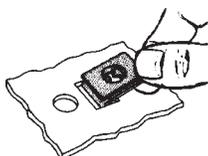
Start Tinnerman **U-Type Speed Nut** over the edge of panel.



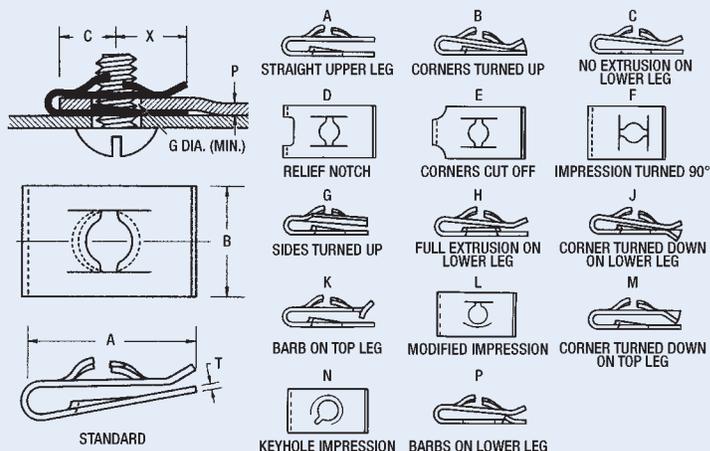
Push into position until extrusion on lower leg snaps into screw hole. The **Speed Nut** "floats" in screw-receiving position to correct for normal misalignment in panel mounting holes.



Place second panel in position and drive the screw. Access to opposite side is unnecessary. Flush mounting can be made by embossing either panel.



U-Type Speed Nut can be installed in center of panel through a rectangular hole, permitting front-mounting attachments.



Screw Size	P Panel Range	Design Variation	A Lgth.	B Width	C Max. Ctr. Hole to Edge	X Ctr. Imp. to End	G Panel Hole Dia.	T Mat'l. Thick.	Part Number
4-40	.062-.094	C	.390	.252	.156	.210	.125	.012	C991-440
6-32	.185-.195	Std.	.590	.312	.263	.317	.218	.017	C71117-632
6A or 6B	.067-.083	F	.465	.500	.203	.210	.187	.025	C71020-6
MAX1.6	1.550-3.000	N	15.750	11.000	6.500	7.870	5.300	.640	C71677-M416
8-32	.099-.104	CDFK	.700	.630	.388	.240	.187	.017	C11459SS-832
8A or 8B	.070-.090	ABDF	.512	.500	.296	.190	.218	.028	C71281-8
10-24	.051-.081	Std.	.630	.440	.281	.320	.281	.020	C596-1024
10A	.065-.087	D	.640	.440	.265	.330	.250	.031	C9240-10A
10A or 10B	.045-.062	E	.950	.500	.562	.350	.250	.031	C8125-10
M5X1.59	2.000-3.000	CDKN	14.350	8.000	6.000	6.500	7.000	.710	C71680-M5159
12-24	.135-.145	EF	.610	.630	.281	.260	.312	.022	C19762-1224
M6X1	1.630-3.180	Std.	24.640	12.700	12.700	10.920	8.710	.640	C1303-M61
1/4-20	.051-.109	H	.790	.500	.312	.390	.343	.025	C14969-1420
14A	.028-.056	E	.930	.560	.421	.430	.312	.037	C8126-14A
14B	.115-.125	C	.970	.500	.500	.420	.281	.037	D11482-14Z
5/16-18	.112-.140	Std.	1.035	.630	.562	.395	.375	.028	C17234-5618

Tinnerman® Single Thread Engaging Self-Retaining Fasteners



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

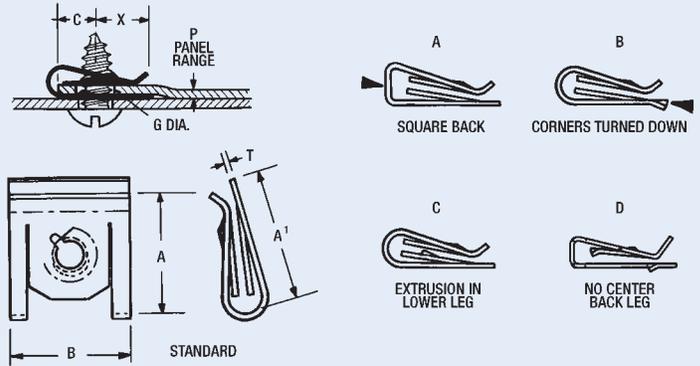
Metric parts listed in italic



U-Type Wide Panel Range Fasteners

This innovative line of **Tinnerman® U-Nuts Fasteners** accommodates an unusually wide range of panel thicknesses from .025" to .150" which satisfies most needs for sheet metal and plastics assembly. A single **Wide Range U-Nut** can replace as many as 5 or 6 separate size nuts required to cover the same capacity. And, it can be supplied in **8AB** thru **14AB** thread sizes.

Engineering, purchasing and manufacturing all benefit from this unique concept. It provides a greater design flexibility and volume purchase economy. It reduces the separate number of parts to buy, stock, handle and inspect. It simplifies application and speeds assembly.



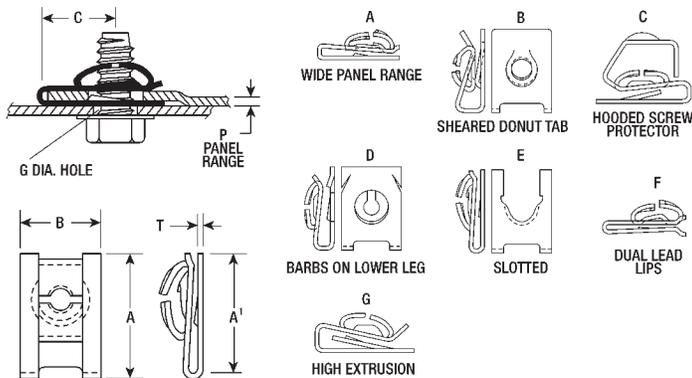
Screw Size	Panel Range	Des. Var.	A	A1	B	C	X	G	T	Part Number
8B or AB	.025-.150	AC	.740	.770	.530	.250	.390	.280	.028	D19640-8AB
	.030-.070	D	.740	.770	.530	.312	.415	.328	.028	D6608-8AB
	.070-.150	D	.670	.750	.530	.312	.380	.328	.028	D6377-8AB
	.090-.110	D	.740	.770	.530	.312	.350	.328	.028	D98189-8AB
10A	.035-.150	Std.	.650	.720	.630	.265	.350	.218	.028	C19822-10A
10B	.025-.150	BC	.650	.720	.630	.265	.350	.281	.031	C19527-10Z
10B or AB	.025-.150	AC	.740	.770	.530	.250	.390	.280	.031	D19640-10AB
14B or AB	.025-.150	Std.	.615	.720	.630	.265	.315	.281	.037	C19603-14Z
14B	.035-.150	B	.615	.720	.630	.265	.315	.281	.037	C70061-14Z



U-Type High Torque Fasteners

High-Torque Fasteners. Equally at home on metal or plastic, these unique Tinnerman fasteners bring extra strength, reliability and economy wherever vibration, impact, or migration prevail.

They accept power driven screws readily, discourage cross-threading, won't clog with paint or freeze to screw threads. They are self-retaining over a wide range of panel thicknesses, yet permit trouble-free removal. Unusually high clamp loads are attainable. Prevailing torque is inherent in the design.



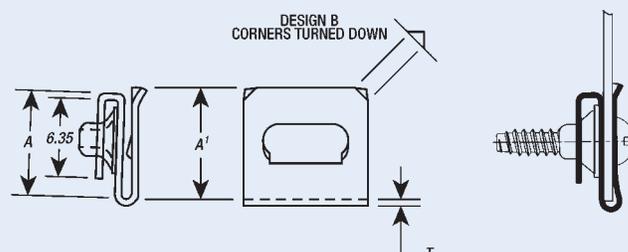
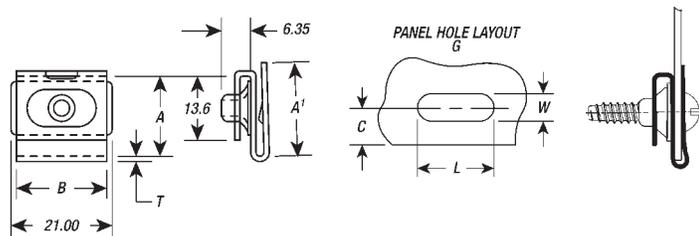
Screw Size	P Panel Range	Prev. Tor.	Des. Var.	A Length	A1 Length	B Width	C Ctr. Edge Max.	G Mnt. Hole Dia.	T Mat. Thick.	Part Number
M4.2	.500-1.000	4.4"lbs.	AB	17.300	18.400	13.600	8.700	8.000	.710	C71629-M42141
	.900-1.100	—	E	16.400	18.300	13.700	9.500	8.330	.710	D98534-071M
	1.800-3.800	4.4"lbs	A	17.700	19.500	13.780	7.920	8.330	.710	D98317-071M
	1.800-3.800	4.4"lbs	C	19.100	17.400	13.400	7.920	8.330	.710	D98337-071M
	1.800-3.800	4.4"lbs	CD	19.100	17.400	13.400	7.900	8.330	.710	D98644-071M
	1.800-4.000	4.4"lbs	AB	17.300	18.400	13.600	8.700	8.000	.710	C71667-M42141
2.400-2.900	—	Std.	17.700	19.500	13.780	7.920	8.330	.710	D98418-071M	
	4.4"lbs	D	17.000	18.500	14.000	8.000	6.750	.710	D98585-071M	
M4.8	.810-1.630	—	E	18.100	18.100	15.050	9.700	7.900	.790	D98682-079M
8AB	.035-.045	5"lbs	E	.634	.720	.540	.320	.320	.028	D98320-071M
	.060-.080	—	E	.640	.720	.540	.250	.310	.028	D6519SS-8AB
10AB	.032-.064	3-12"lbs	DE	.825	.825	.593	.500	.312	.031	C71469-10AB
	.070-.090	8-20"lbs	A	.665	.740	.545	.310	.330	.031	D98495-079M
M5	2.400-2.900	4.4"lbs	D	17.000	18.500	14.000	8.000	6.750	.790	C71658-079M
M6.3	4.400-5.000	90"lbs	AB	25.000	24.000	19.000	14.000	10.400	.940	D98645-094M
14AB	.025-.050	2.25"lbs	EF	.855	.855	.593	.500	.312	.037	D44818-037
	.095-.115	—	E	.840	.840	.593	.468	.312	.037	D49839-037
5/16-12	.120-.150	—	E	.990	.990	.690	.500	.437	.037	D51849-037

Frequently Specified Fasteners **12** Thousands More Available!

K&L Sales Inc . 1-800-284-5528 Fax @ 1-800-535-1526 e-mail sales@klsales.com

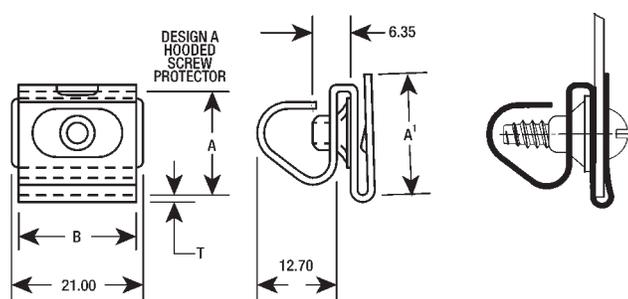
Material: All parts are **Spring Steel**, heat treated, unless otherwise specified.
 The only variations available are those shown with suffix letters in the part number.
 SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

U-Type Self-Aligning Fasteners Type 1

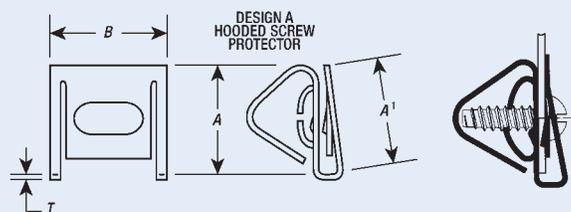
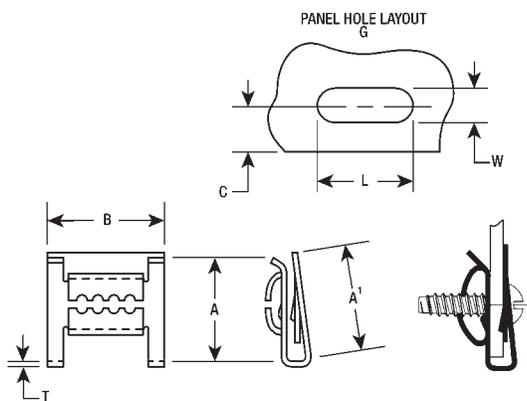


Type 1. Sliding Aligners

Screw Size	P Panel Range	Des. Variation	A Lngth.	A1 Lngth.	B Width	C Max. Hole to Edge	G Panel Hole Dia.	T Mat'l. Thick.	Part Number
M4.2	.800-1.350	B	17.500	18.200	19.050	9.500	19.00x7.00	.710	D98511-M42141
M4.2x1.41	.800-1.350	Std.	17.500	21.600	19.050	9.500	19.00x7.00	.710	D98357-8AB
	.800-1.350	A	17.500	19.600	19.050	9.500	19.00x7.00	.710	D98377-8AB
	1.500-3.000	A	18.900	19.060	19.050	9.500	19.00x7.00	.710	D98657-8AB



U-Type Self-Aligning Fasteners Type 2



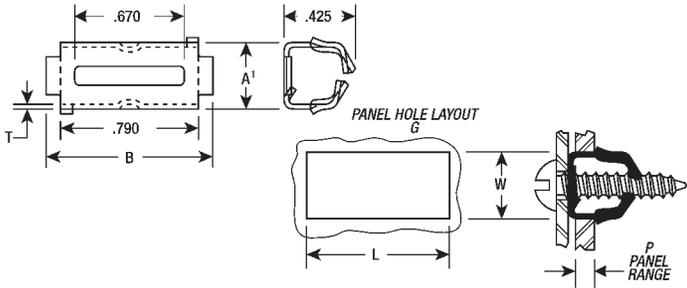
Type 2. Multi-Impression Aligners

Screw Size	P Panel Range	Des. Variation	A Lngth.	A1 Lngth.	B Width	C Max. Hole to Edge	G Panel Hole Dia.	T Mat'l. Thick.	Part Number
M4.2	.500-1.800	A	20.400	21.500	21.400	9.500	15.90x5.60	.790	D98364-8Z
	1.270-3.300	Std.	21.000	22.500	23.800	9.500	15.90x5.60	.790	D98348-8Z
8B	.020-.071	Std.	.795	.835	.843	.374	.626x.220	.031	D98436-8Z
	.020-.071	Std.	.795	.835	.937	.374	.626x.220	.031	D98507-8Z
	.050-.130	Std.	.787	.847	.937	.276	.626x.295	.031	D98437-8Z
	.079-.150	Std.	.787	.847	.937	.276	.626x.295	.031	D98612-8Z
8B or 8AB	.050	Std.	.709	.709	1.094	.374	.626x.220	.031	D98588-8Z
	.079-.150	Std.	.776	.835	.843	.315	.866x.276	.031	D98552-8Z

The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in *italic*

U-Type Self-Aligning Fasteners Type 3



Type 3. Slotted Alignnuts

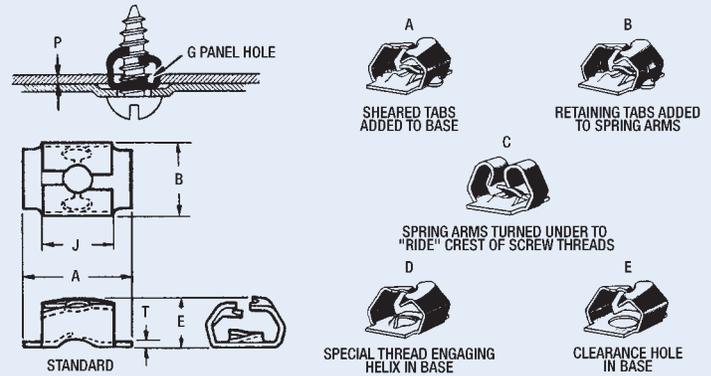
Screw Size	P Panel Range	Des. Variation	A Lngth.	A1 Lngth.	B Width	C Max. Hole to Edge	G Panel Hole Dia.	T Mat'l. Thick.	Part Number
<i>M4.2x1.41</i>	<i>.700-1.200</i>	<i>Std.</i>	<i>-</i>	<i>9.950</i>	<i>25.500</i>	<i>-</i>	<i>20.85x10.35</i>	<i>710</i>	<i>D98772-071M</i>
8AB	.100-.125	Std.	-	.390	1.004	-	.821x.407	.028	D71444-8



Expansion-Type Fasteners

Expansion-Type Speed Nut Fasteners provide fast, vibration-resistant attachments in blind or center-panel locations where only one side is accessible. They snap easily into square or round holes and are self retained by spring legs. Special locking tabs are provided where permanent fastener retention is desired.

As the screw is driven, it expands the spring legs, locking them over the panel thickness and at the same time providing a double-locking action on the screw. These easy to apply fasteners require no special skills or equipment to install, can be used in place of weld-, clinch- or stake-type fasteners. Applied before or after painting, they will not clog – do not require masking. And, they can be safely applied after procelainizing.



How to apply Speed Clip Expansion-Type Fasteners



Screw Size	P Panel Range	Des. Var.	A Length	B Width	E Hght.	J Width of Spring Arms	G Panel Hole	T Material Thick-ness	Part Number
6A	.045-.065	E	.400	.320	.260	.240	.290-.296	.025	C10493-6A
8A	.045-.063	D	.380	.280	.200	.250	.268-.281 Sq.	.020	C9636SS-8A
8B	.094-.114	BD	.626	.319	.289	.320	.341 Sq.	.025	D98363-8Z
10AB	.075-.105	AB	.570	.420	.285	.570	.398-.531 Sq.	.020	C70825-10AB
10A	.036-.056	C	.570	.530	.350	.270	.503-.508 Sq.	.022	C8653-10A
	.050-.062	A	.560	.420	.280	.360	.390-.406 Sq.	.020	C8799-10A
10B	.118-.147	BD	.500	.321	.268	.225	.365-.385 Sq.	.025	D98307-10Z
14A	.035-.045	F	.752	.500	.721	.250	.370-.380 Sq.	.031	C15872-14A

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number.
 SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

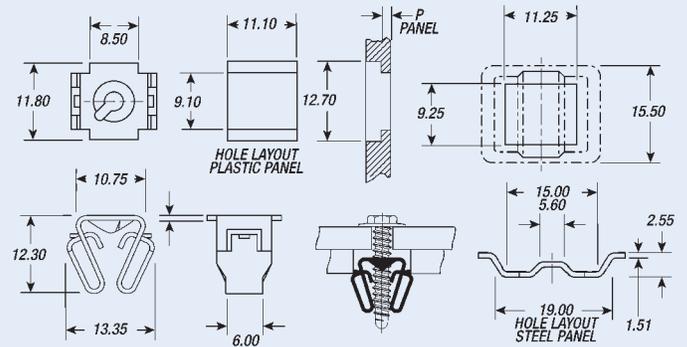


Special Expansion-Type Fasteners

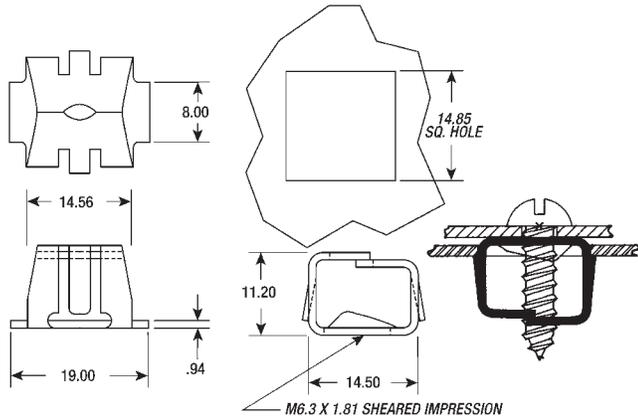
Special Expansion-Type Tinnerman Fasteners

On this page are examples of **Expansion-Type Fasteners** which have been developed to solve specific fastening problems. The expansion principle is the same, but forms vary to: plug a temporarily unused hole, provide vibration-resisting adjustment, fasten in wood, heavy gauge metal or odd-shaped panel holes. They illustrate Tinnerman's ability to help the manufacturer fasten his product better, faster and at lower cost.

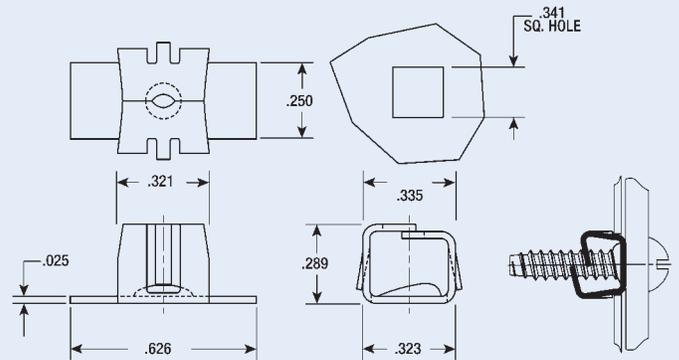
Perhaps one of these **"Specials"** will suit or suggest an answer to your particular fastening problems.



Screw Size	P Panel Range	T Material Thickness	Part Number
M4.2	2.300-2.800	.640	D98664-064M
	2.300-2.800	.710	D98627-071M



Screw Size	P Panel Range	T Material Thickness	Part Number
M6.3x1.81	.900-1.200	.940	C71690-M63181



Screw Size	P Panel Range	T Material Thickness	Part Number
8B	.028-.039	.025	D98621-8Z
	.039-.059	.025	D98683-8Z

Tinnerman® Multiple Thread Engaging Nut and Bolt Retainers



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

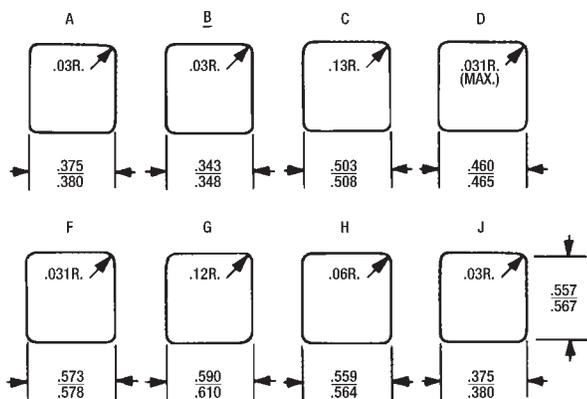
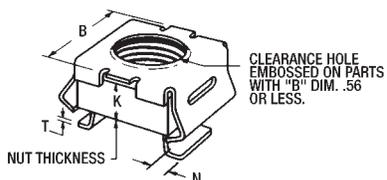
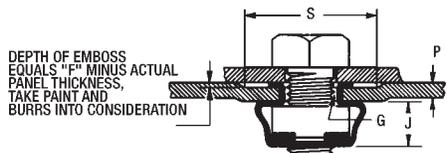
Metric parts listed in *italic*



Nut Retainers

Tinnerman **Nut Retainers** combine the best advantages of spring steel fasteners with the high strength of a multi-threaded nut. They snap readily into bolt-receiving position at panel edges or center-panel locations and retain themselves in place.

Their application does not require special tools or skills, eliminating the need for special operations. They can be applied at any convenient spot along the assembly line after painting or porcelainizing, thus eliminating the need for masking or retapping clogged threads. The nut floats within the spring steel cage more than enough to offset normal hole misalignment. No other line of heavy duty fasteners offers so many advantages for blind location assembly.



Screw Size	P Panel Range	F	S Emboss Sq. (min.)	G Mnt. Hole	B	J	N	K	T	Mat'l. Thick.	Part Number
6-32	.025-.063	.097	.421	.281 sq.	.450	.190	.060	.124	.017		D30395-632
	.064-.105	.140	.531	A or B	.520	.250	.060	.156	.020		D7941-632
	.093-.126	.160	.531	A or B	.520	.250	.060	.156	.020		D7951-632
MAX.7	<i>.635-1.600</i>	<i>2.540</i>	<i>13.487</i>	<i>A or B</i>	<i>13.208</i>	<i>6.350</i>	<i>1.524</i>	<i>3.962</i>	<i>.508</i>		<i>D7931-M407</i>
	<i>1.626-2.667</i>	<i>3.556</i>	<i>13.487</i>	<i>A or B</i>	<i>13.208</i>	<i>6.350</i>	<i>1.524</i>	<i>3.962</i>	<i>.508</i>		<i>D7941-M407</i>
8-32	.025-.063	.100	.531	A or B	.520	.250	.060	.156	.020		D7931-832
	.064-.105	.140	.531	A or B	.520	.250	.060	.156	.020		D7941-832
	.093-.126	.160	.531	A or B	.520	.250	.060	.156	.020		D7951-832
	.125-.156	.190	.531	A or B	.520	.250	.060	.187	.020		D31365-832
10-24	.025-.063	.100	.531	A or B	.520	.250	.060	.156	.020		D7931-1024
	.064-.105	.140	.531	A or B	.520	.250	.060	.156	.020		D7941-1024
	.093-.126	.175	.734	C or D	.660	.300	.100	.218	.025		D7957-1024
	.125-.156	.190	.531	A or B	.520	.250	.060	.187	.020		D31365-1024
10-32	.025-.063	.100	.531	A or B	.520	.250	.060	.156	.020		D7931-1032
	.064-.105	.140	.531	A or B	.520	.250	.060	.156	.020		D98579-1032*
	.093-.126	.190	.531	A or B	.520	.250	.060	.156	.020		D7951-1032
M5X.8	<i>1.626-2.667</i>	<i>3.556</i>	<i>13.487</i>	<i>A or B</i>	<i>13.208</i>	<i>6.350</i>	<i>1.524</i>	<i>3.962</i>	<i>.508</i>		<i>D7941-M508</i>
	.025-.063	.100	.531	A or B	.520	.250	.060	.156	.020		D7931-1224
M6X1	<i>.635-1.600</i>	<i>2.540</i>	<i>13.487</i>	<i>A or B</i>	<i>13.208</i>	<i>6.350</i>	<i>1.524</i>	<i>4.750</i>	<i>.508</i>		<i>D7988-M61</i>
	<i>1.620-2.670</i>	<i>3.560</i>	<i>13.490</i>	<i>A or B</i>	<i>13.210</i>	<i>6.350</i>	<i>1.520</i>	<i>4.720</i>	<i>.510</i>		<i>D98580-M61*</i>
1/4-20	.025-.063	.100	.531	A or B	.520	.250	.060	.187	.020		D7988-1420
	.064-.105	.140	.531	A or B	.520	.250	.060	.186	.020		D98580-1420*
	.093-.126	.160	.531	A or B	.520	.250	.060	.187	.020		D7956-1420
	.125-.156	.190	.531	A or B	.520	.250	.060	.186	.020		D98581-1420*
5/16-18	.028-.056	.095	.734	C or D	.660	.300	.100	.218	.025		D7937-5618
	.093-.126	.175	.734	C or D	.660	.300	.100	.218	.025		D7957-5618
	.127-.162	.205	.734	C or D	.660	.300	.100	.218	.025		D7935-5618
5/16-24	.093-.126	.175	.734	C or D	.660	.300	.100	.218	.025		D7957-5624
M8X1.25	<i>2.362-3.200</i>	<i>4.445</i>	<i>18.644</i>	<i>C or D</i>	<i>16.764</i>	<i>7.620</i>	<i>2.540</i>	<i>5.537</i>	<i>.635</i>		<i>D7957-M8125</i>
	<i>4.496-5.004</i>	<i>6.223</i>	<i>18.644</i>	<i>C or D</i>	<i>16.764</i>	<i>7.620</i>	<i>2.540</i>	<i>5.537</i>	<i>.635</i>		<i>D31910-M8125</i>
3/8-16	.028-.056	.095	.734	C or D	.660	.300	.100	.218	.025		D7937-3816
	.093-.126	.165	.828	E or H	.870	.410	.100	.304	.025		D7969-3816
	.162-.210	.245	.828	G or F	.870	.410	.100	.304	.025		D30683-3816
	.240-.260	.305	.812	E or F	.870	.410	.100	.304	.025		D30096-3816
3/8-24	.240-.260	.305	.812	E or F	.870	.410	.100	.304	.025		D30096-3824
M10X1.5	<i>3.226-4.115</i>	<i>5.207</i>	<i>18.644</i>	<i>C or D</i>	<i>16.764</i>	<i>7.620</i>	<i>2.540</i>	<i>5.537</i>	<i>.635</i>		<i>D7935-M1015</i>
7/16-14	.093-.126	.165	.828	E or F	.870	.410	.100	.304	.025		D7969-7614
	.162-.210	.245	.828	G or F	.870	.410	.100	.304	.025		D30683-7614
1/2-13	.059-.092	.135	.828	E or F	.870	.410	.110	.304	.025		D7968-1213
	.127-.162	.205	.828	E or F	.870	.410	.100	.304	.025		D7925-1213
	.240-.260	.305	.812	E or F	.870	.410	.100	.304	.025		D30096-1213

* Stainless Steel Parts

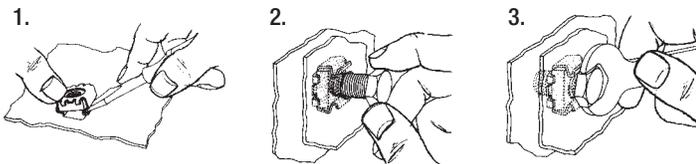


Material: All parts are Spring Steel, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

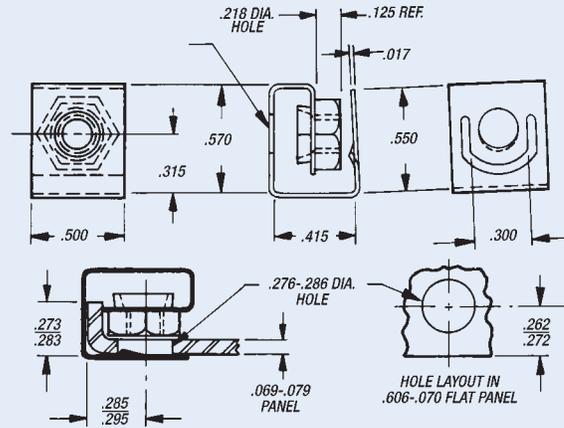


Nut Retainers (Continued)

How to apply Nut Retainers



1. One retaining leg of the **Nut Retainer** is inserted in the panel hole. The other leg is snapped in place with a simple tool.
2. The second panel is then aligned and the bolt is started into the the threads of the captive nut.
3. The **Nut Retainer**, being self-retained in a square hole, cannot turn as the bolt is tightened. Positive, high torque attachment is the result.



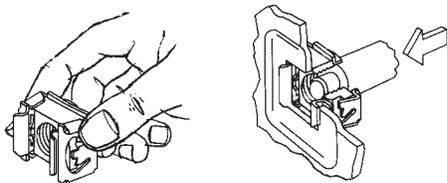
Screw Size	Part Number
10-32	D31758-1032
M5X.8	D31758-M508



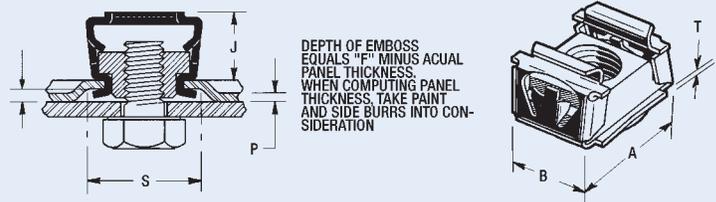
Self-Anchoring Nut Retainers

Tinnerman **Self-Anchoring Nut Retainers** offer the same advantages as the preceding **Nut Retainers**; i.e., high strength, easy to apply for blind fastening locations, self-retention, etc. In addition, this variety provides a unique feature which firmly locks the fastener in the panel, distributing the driving torque through the surrounding panel area. This is accomplished with a T-shaped captive nut, cleverly devised locking tabs, and mounting legs. It cannot be accidentally dislodged even with excessively rough handling. However, should thread damage occur due to cross-threading or over torquing, it can be deliberately removed without damage to panel or finish. **Self-Anchoring Nut Retainers** are recommended for applications where fasteners with less permanent retention are apt to be lost due to stacking, butting or rough handling of panels on the production line.

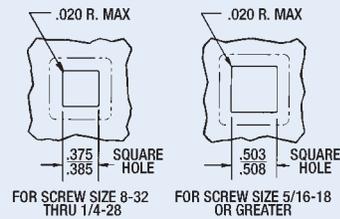
How to apply Self- Anchoring Nut Retainers



Self-Anchoring Nut Retainers are set into the panel mounting hole after the finishing process. The spring steel mounting legs temporarily hold the fastener in place as the T-nut is pressed into locked position in the panel. As the T-nut expands the mounting legs around the panel, it forces past spring tabs provided in the retainer which snap back locking the fastener firmly, permanently in the panel.



HOLE SIZES



Screw Size	P Panel Range	F	S Emboss Square (min.)	A Length	B Width	J	T Mat'l. Thick.	Part Number
10-32	.093-.126	.180	.620	.525	.460	.300	.017	D30802-1032
1/4-20	.025-.063	.110	.620	.525	.530	.300	.017	D30800-1420
5/16-18	.057-.092	.140	.690	.718	.600	.420	.020	D30804-5618



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

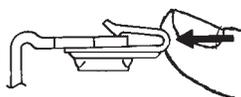
Metric parts listed in italic



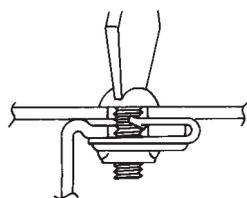
J-Type Nut Retainers

The **J-Type Nut Retainer** combines a spring steel retainer with a multiple-threaded nut to provide an ideal fastener for heavy duty applications requiring high torque tightening, low fastener profile, "float" for hole misalignment and blind assembly. They are easily snapped over panel edges or inserted into rectangular holes in central-panel locations. Floating alignment and retention are attained with extrusions in the retaining legs which snap into panel mounting holes allowing the fastener to shift or align, but not disengage. Applied after painting or porcelainizing, **J-Type Nut Retainers** eliminate the need for masking or retapping clogged threads.

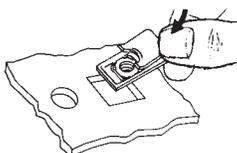
How to apply J-Type Nut Retainers



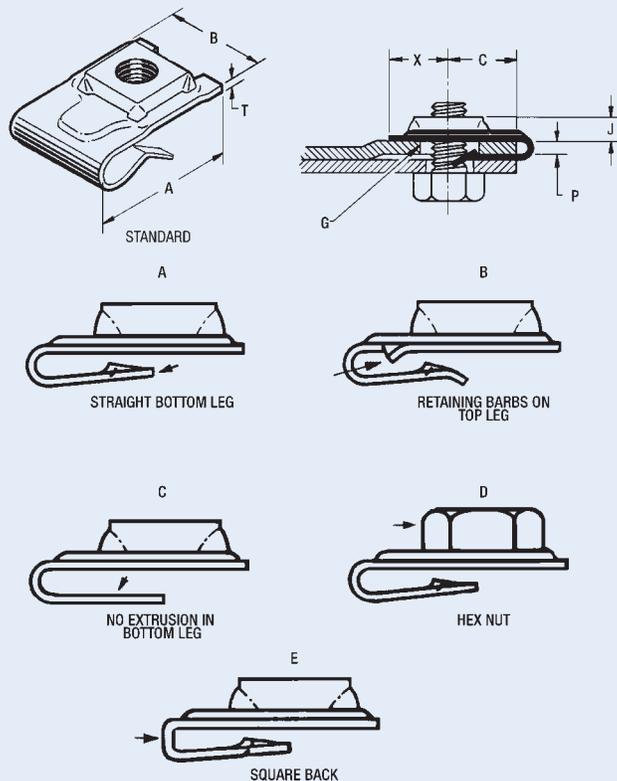
Push into place on panel, snapping the extrusion into the mounting hole. Short retaining leg of **J-Type Nut Retainers** allows complete visibility of mounting hole while nut retainer is being attached. Access to back of panel is unnecessary in final assembly stage.



Position second panel and drive screw. Both hands are free to align panels or components and complete assembly. Flush mounting is obtained by embossing either panel.



J-Type Nut Retainers can be installed in center panel locations through a rectangular hole as illustrated here.



Screw Size	P Panel Range	Design Variation	A Lngh.	B Wdth.	C Ctr. to Edge (Max.)	X Ctr. to End	J	G Panel Hole Dia. (Min.)	T Mate-rial Thick-ness	Part Number
10-24	.032-.093	D	.946	.625	.500	.395	.233	.437	.025	C33892-1024
10-32	.032-.093	D	.946	.625	.500	.395	.233	.437	.025	C33892-1032
<i>M6X1</i>	<i>2.290-3.560</i>	<i>D</i>	<i>26.290</i>	<i>19.050</i>	<i>12.700</i>	<i>11.690</i>	<i>8.740</i>	<i>13.490</i>	<i>.710</i>	<i>C33896-M61</i>
1/4-20	.032-.093	D	.946	.625	.500	.395	.233	.437	.025	C33892-1420
	.090-.140	D	1.035	.750	.500	.460	.344	.531	.028	C33896-1420
1/4-28	.032-.093	D	.946	.625	.500	.394	.233	.437	.025	C33892-1428
5/16-18	.050-.090	D	1.050	.750	.546	.460	.344	.531	.028	C33952-5618
	.130-.140	ACDE	.820	.687	.400	.385	.330	.343	.031	C33754-5618
3/8-16	.090-.140	D	1.035	.750	.500	.460	.344	.531	.028	C33896-3816
	.093-.203	Std.	1.480	.750	.750	.440	.230	.437	.028	C31280-3816

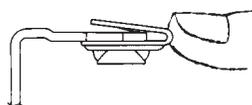
Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze



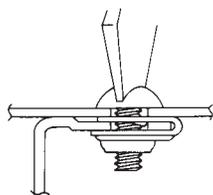
U-Type Nut Retainers

U-Type Nut Retainers offer the same advantages as the **J-Type Nut Retainers**. That is, heavy-duty fastening, low fastener profile, "float" for hole misalignment, self-retention and blind location fastening. With the full-sized lower leg, the **U-Type Nut Retainer** is preferred where a full bearing surface between the panels is desired. They are applied simply and quickly in center, or end-panel locations requiring no special skills or equipment.

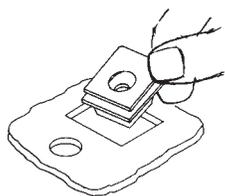
How to apply U-Type Nut Retainers



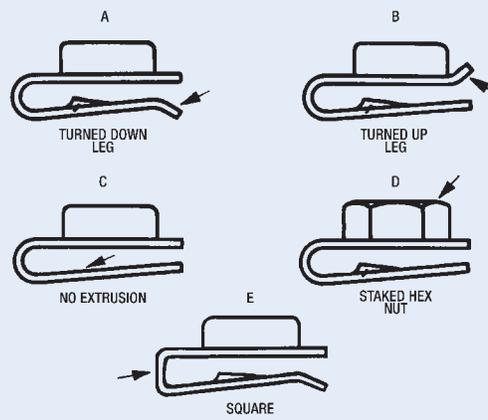
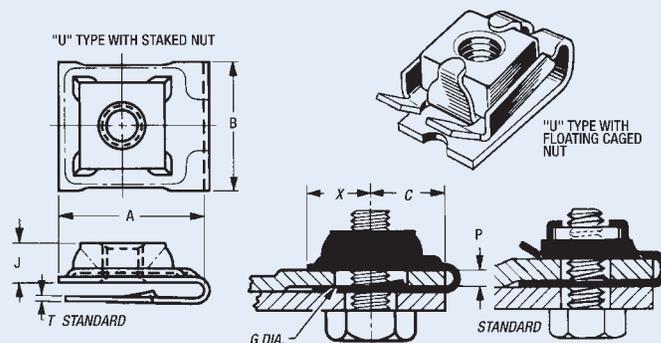
Position the second panel and drive the screw. Both hands are free to align panels and complete the assembly. Flush mounting is attained by embossing either panel.



Push into bolt receiving position on panel until extrusion snaps into mounting hole. Access to the back of the panel is unnecessary as the nut retainer is self-retaining and the nut is trapped to prevent turning.



U-Type Nut Retainers can be installed in center-panel locations through a rectangular hole as illustrated here. They offer an ideal solution for blind fastening.



Screw Size	P Panel Range	A Design Variation	B Lngh. Wdth.	C Ctr. to Edge (Max.)	X Ctr. to End	J	G Panel Hole Dia. (Min.)	T Mate-rial Thick-ness	Part Number
10-24	.050-.075	D	.710	.687	.375	.310	.233	.343 .025	C33945-1024
	.115-.125	D	.710	.687	.375	.310	.233	.300 .025	C33962SS-1420
10-32	.050-.075	D	.710	.687	.375	.310	.233	.343 .025	C33945-1032
M5X.8	2.280-4.820	E	28.000	16.000	12.700	12.700	5.100	9.500 .860	C33983-M508
M6X1	1.270-1.910	CD	18.040	17.450	9.520	7.870	5.910	7.140 .640	C33948-M61
	2.280-4.820	E	28.000	16.000	12.700	12.700	6.170	9.500 .860	C33823-M61
1/4-20	.050-.075	D	.710	.687	.375	.310	.233	.343 .025	C33945-1420
	.120-.130	Std.	1.340	.750	.840	.420	.230	.437 .028	C31368-1420
5/16-18	.120-.130	Std.	1.340	.750	.840	.420	.230	.437 .028	C31368-5618



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in italic

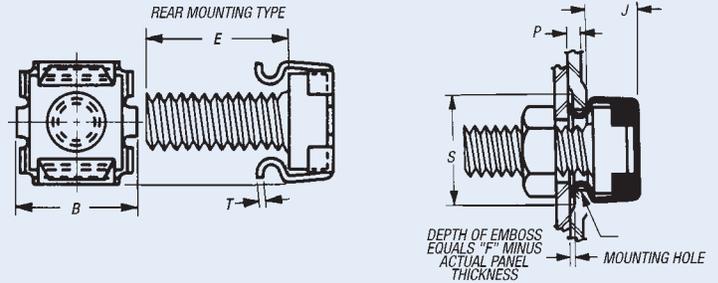
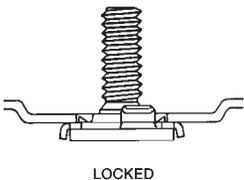
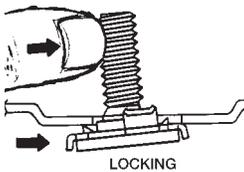
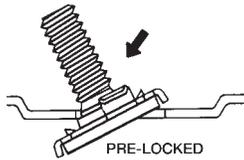


Bolt Retainers Rear Mounting Type

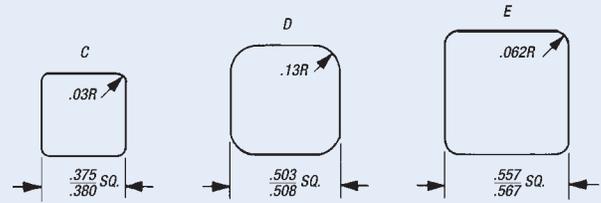
Tinnerman **Bolt Retainers** eliminate problems of blind location, bolt retention, threaded stud damage, paint-clogged threads, weld flash and difficult assembly or removability wherever threaded studs may be used. They can be attached after finishing and just before final assembly to eliminate thread damage due to stacking, weld flash, paint clogging, etc. One type is mounted from the front to ease assembly in blind or difficult locations. Both are self-retained and can be easily removed and replaced without damage to the mounting panel. Access to the underside of the panel is unnecessary because the bolt cannot turn as the nut is driven to its prescribed torque. A shallow emboss allows flush mounting of mating panels.

How to apply Bolt Retainers

Hold the threaded bolt between the thumb and forefinger. Tip the retainer into the mounting hole allowing the wing-like spring legs to rest on the panel. Apply a rearward pressure on the top panel side of the bolt until the embossed shear snaps into the panel hole locking the **Bolt Retainer** in position.



MOUNTING HOLE VARIATIONS



Screw Size	Panel Range	B Width	E	F	G Mounting Hole	J	S Emboss Square (Min.)	T Mat'l. Part Thck. Number
<i>M6X1</i>	.650-1.600	13.475	22.000	2.350	C	6.300	13.500	.510 C33987-M61
<i>M8X1.25</i>	.500-1.000	16.750	50.000	2.410	D	7.620	18.640	.640 D98655-M8125

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

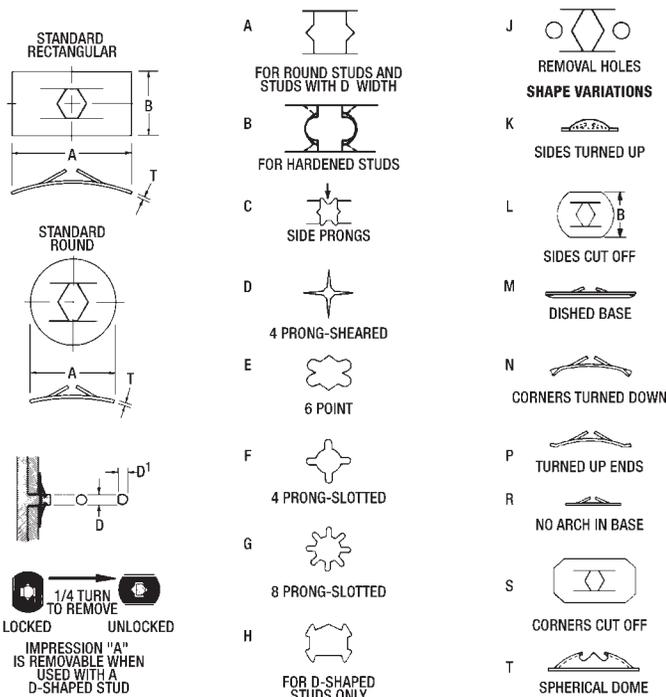


Push-on-Type Fasteners (Round Studs)

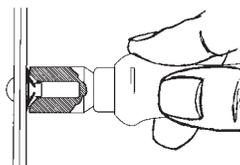
Tinnerman **Push-On-Type Fasteners** provide lightning-fast attachments to plain unthreaded studs such as rivets, die cast studs, tubing, nails, rods, etc. They make a positive “bite” on metal, plastic or wood and grip securely even on very smooth, hard surfaces. No threaded devices of any kind are necessary; therefore, the rate of assembly can be greatly increased through their use. Attachments can be made permanent or removable, as the product requires, by simply using the proper fastener or stud modification recommended. Made of quality high carbon spring steel, heat treated, they assure long, dependable service life at a minimum of assembly cost.

D Dia.	Stud Size D1 Width	Type	Des. Variation	A Length or Dia.	B Width	T Mat'l. Thick.	Part Number
.059-.065	.044-.054	Rect.	A	.380	.220	.012	C12001-012
		Round	Std.	.500	—	.012	C11033-012
.091-.097	.069-.079	Rect.	A	.450	.230	.012	C12002-012
		Round	CR	.220	—	.010	C13388SS-010
.122-.128	.095-.105	Rect.	A	.580	.310	.012	C12003-012
		Round	Std.	.430	—	.012	C17969-012
.153-.159	.120-.130	Rect.	AJ	.870	.560	.012	C17182-012
		Round	DM	.380	—	.012	C13790-012
.185-.191	.145-.155	Rect.	A	.630	.380	.017	C12005-017
		Round	FM	.560	—	.011	C18234-187
.216-.222	.170-.180	Rect.	A	.620	.440	.012	C12006-017
		Round	L	.500	.380	.017	C12045-017
6.100-6.250	---	Round	AR	19.050	---	.300	C71631-030M
.247-.253	.182-.192	Rect.	A	.640	.560	.012	C573-012
		Round	L	.560	.440	.017	C12046-017
.309-.315	---	Rect.	Std.	.630	.500	.014	C7818-014
		Round	GR	.630	---	.010	C17022SS-010
.372-.378	.295-.305	Rect.	A	.750	.560	.020	C12009-020
		Round	FM	.730	---	.014	C18235-375
.436-.438	---	Rect.	Std.	1.000	.690	.020	C6313-020
		Round	BL	.910	.630	.017	C11600-017
.495-.505	---	Rect.	P	.920	.750	.017	C867-017
		Round	FR	.790	---	.014	C70524-014
14.000-14.000	---	Rect.	Std.	31.000	22.300	.430	D98166-043M
.620-.630	---	Rect.	Std.	.980	.810	.017	C1529-017
		Round	GR	.960	---	.014	C70891SS-014
.740-.750	---	Round	GR	1.630	---	.025	C15802-025
		Rect.	P	1.480	1.250	.017	C1583-017
.995-1.005	---	Rect.	PS	1.450	1.250	.017	C7195-017
		Round	A	2.300	---	.017	C13232-017
1.997-2.003	---	Rect.	FN	2.750	2.750	.014	C10044-014

IMPRESSION VARIATIONS



How to apply Push-on-Type Speed Nut Fasteners



Stud engaging **Speed Nut** brand fasteners are used in two ways. Either as free parts which are pressed over shaft, stud or rod ends; or captive parts which are retained on a panel in stud-receiving position. Whether the fastener is applied to the work or the work is applied to the fastener, the method is simply to position the two in square alignment and zip into locked position.



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in *italic*



Grooveless Retainer Rings

Superior stainless steel fasteners. Provide 360° of bearing surface for maximum holding power...without a groove!

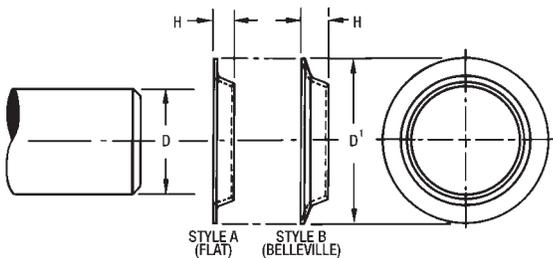
Tinnerman **Grooveless Retainer Rings** press over studs, shafts, or any round shape from .046" to 2.00" diameter. **G-R-R's** become an integral part of the axial application, replacing snap or bearing rings, cotter pins, staking, swaging, spinning, heat forming, ultrasonics, coining, cementing, or upsetting... eliminating high-cost operations.

Designed without slots, or shears, **G-R-R's** will not "walk-off" or spring free. Low profile flat designs require a minimum of space. Wall dimensions as thin as .024" make them ideal for limited access locations. They need as little as .032" of shaft or stud extension for full anchor.

Quality stainless steel assures long life, corrosion resistance, minimal distortion, dry finish, eliminates heat treat, finish and handling operations...and the extra costs they entail.

A full range of sizes has been developed on modular tooling. Virtually any unlisted size can be made that falls within the limits of the tools, for a one-time set up charge. Sizes beyond this range can be made but require special tooling.

*Patented



Material: 300 Series Stainless Steel Preferred
 Finish -576 Degreased, clean, and free of oil
 -27 Soluble oil, dipped
 -928 Mildly Alkaline Acrylic Water Based Rust Preventative
 -4 Phosphate and Oil

† Parts identified available in Spring Steel material only-standard finish-27.

Metric Equiv. (mm.)	D Stud Size	D1 Dia.	H Height	T Mat'l. Thick.	Style	Part Number
1.170	.046	.088	.017	.006	A	T99220SS-125-576
1.570	.062	.150	.020	.010†	A	T99220-210-27
2.360	.093	.245	.030	.008	A	T99220SS-75-576
	.093	.325	.025	.006	A	T99220SS-87-576
2.970	.117	.245	.030	.008	A	T99220SS-67-576
3.960	.156	.260	.025	.008	A	T99220SS-66-576
4.000	.157	.243	.025	.008	A	T99220SS-203-576
4.110	.162	.437	.040	.015	A	T99220SS-86-576
4.750	.187	.312	.025	.006	A	T99220SS-68-576
	.187	.375	.030	.012	A	T99220SS-126-576
5.080	.200	.405	.050	.022†	A	T99220-99-27
5.590	.220	.325	.025	.008	A	T99220SS-97-576
6.020	.237	.437	.030	.010	A	T99220SS-90-576
	.237	.531	.045	.017	A	T99220SS-196-576
6.290	.248	.750	.060	.025†	A	T99220-171-4
6.300	.248	.750	.030	.010	A	T99220SS-144-576
6.350	.250	.437	.050	.010	B	T99220SS-104-576
	.250	.625	.030	.010	A	T99220SS-137-576
7.620	.300	.500	.055	.022†	A	T99220-154-928
7.920	.312	.437	.030	.010	A	T99220SS-64-576
	.312	.564	.035	.015	A	T99220SS-141-576
	.312	.625	.050	.022†	A	T99220-112-27
8.000	.315	.500	.035	.010	A	T99220SS-161-576
8.710	.343	.562	.030	.010	A	T99220SS-132-576
9.270	.365	.560	.050	.020†	A	T99220-163-4
9.460	.372	.500	.043	.020	A	T99220SS-173-576
9.520	.375	.625	.030	.010	A	T99220SS-91-576
9.530	.375	.590	.030	.010	A	T99220SS-152-576
11.100	.437	.655	.040	.020	A	T99220SS-150-576
11.460	.451	.610	.030	.010	A	T99220SS-139-576
11.730	.462	.750	.025	.008	A	T99220SS-88-576
12.000	.472	.783	.070	.031	A	T99220SS-181-576
12.700	.500	.750	.025	.010	A	T99220SS-120-576
14.000	.551	21.900	2.000	1.060†	A	T99220-200-4
15.880	.625	.940	.089	.037†	A	T99220-207-4
18.260	.719	25.400	—	.430	A	T99220SS-205-576
25.400	1.000	1.750	.040	.014†	A	T99220-199-4
40.950	1.612	2.250	.240	.050†	A	T99220-157-4

Material: 300 Series Stainless Steel (preferred)
 Finish: -576 Degreased, clean, and free of oil.
 -27 Soluble oil, dipped
 -928 Mildly Alkaline Acrylic Water Based Rust Preventative
 -4 Phosphate and Oil

† Parts identified available in Spring Steel material only-Standard Finish-27.

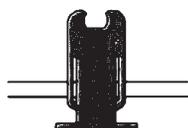
Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze



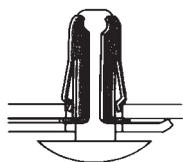
Tubular-Type Fasteners

Tubular-Type Speed Clips team up with unthreaded studs or rivets to virtually “nail” assemblies together. Hand-snapped into punched or molded holes in metal, plastic or wood, they retain themselves in stud-receiving position. The mating panel is positioned with mounting studs properly aligned and pressed home to complete the assembly. **Tubular-Type Speed Clips** are ideal for making fast, practical attachments where only one side of an assembly is accessible ... perfect for attaching name plates, instruction plates, grille work and decorative trim, knobs, insulation dust shields and other lightweight equipment.

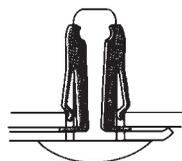
How to apply Tubular-Type Speed Clip Fasteners



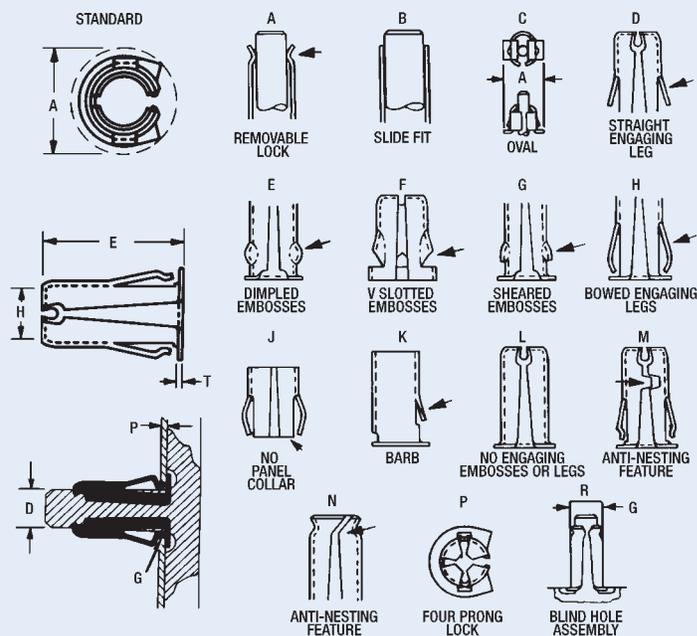
Insert the **Speed Clip** into the panel hole causing spring arms to compress. When fully seated, the spring arms snap out behind the panel to hold the clip in position.



Line up the mating panel and start rivet or stud into **Speed Clip**.



Seat rivet, causing it to engage turned-in end of **Speed Clip**, locking assembly. A rounded stud end is recommended for greater ease of assembly.



D Stud Dia.	P Panel Range	Des. Variation	A	E Height	H Opening at End	G Panel Hole Dia.	T Mat'l. Thick.	Part Number
.088-.098	.070-.085	DP	.270	.270	.050	.185-.189	.012	C21017-070
.091-.097	---	ALR	.190	.230	.080	.115-.125	.010	C3385-010
2.970-3.120	2.290-2.790	CDM	11.470	10.160	2.030	6.350x12.700	.430	C57238-229M
.122-.128	.038-.044	Std.	.210	.260	.104	.156-.166	.012	C2204-040
	.079-.085	Std.	.230	.260	.104	.156-.166	.012	C2477-081
	---	ALR	.240	.250	.110	.155-.160	.012	C2997-012
3.650-4.150	1.150-1.650	BD	7.130	5.600	3.980	5.330 - 5.330	.430	C57969-043M
.151-.161	.052-.066	Std.	.320	.450	.136	.223-.233	.012	C25152-052
	.100-.110	Std.	.320	.450	.136	.223-.233	.012	C25152-100
	.123-.129	A	.310	.470	.140	.223-.233	.012	C24316-125
.182-.192	.115-.121	Std.	.310	.470	.163	.223-.233	.012	C22519-115
.184-.190	.045-.055	DP	.340	.310	.125	.245-.255	.017	C40776-045
.185-.191	.049-.055	A	.320	.470	.166	.223-.233	.012	C2350SS-051
	.062-.068	Std.	.320	.460	.163	.223-.233	.012	C2822-064
.245-.255	.030-.034	AE	.410	.370	.232	.307-.317	.014	C22310-030
	.040-.062	E	.360	.390	.220	.307-.317	.014	C27947-040
	---	ALR	.410	.370	.232	.276-.286	.014	C23764-014
.309-.315	.036-.045	AFM	.440	.250	.300	.340-.350	.012	C4601-036
8.000 - 8.000	5.850 - 5.850	CG	14.750	10.490	6.780	10.15 x 10.15 Sq.	.430	C57779-043M
.497-.503	.046-.052	AF	.680	.330	.470	.528-.534	.012	C23205-046
.747-.750	.240-.260	ADM	.855	1.090	.703	.812-.820	.017	C57928-240



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in *italic*



Ball-Stud Fasteners

Ball-Stud Speed Clips were originally developed as spring catch fasteners on aircraft access doors, inspection panels, sealing strips and other similar assemblies requiring repeated disengagement. Their versatility soon found them used extensively in other fields where they secured kitchen cabinet doors, removable toe plates, electronic cabinets, protective covers, etc. There is no direct contact between the stud and panel surfaces. This eliminates wear or chipping of painted or porcelainized surfaces and resulting corrosion. When latched, the spring legs of the **Speed Clip** continually bear inward on the spherical or serrated studs, holding the latched unit snug against the panel.

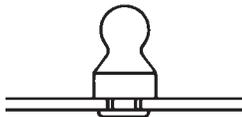
Where adjustability or wide latching ranges are required, the serrated stud is used. They are mainly used for attaching compressionable materials such as rubber, fabric, insulation, etc.

Pull-out tensions, depending on the material thickness of the **Speed Clip** and the stud used, can be provided from 3.5 pounds to 50-65 pounds. Various panel thicknesses are accommodated by varying the stud lengths.

How to apply Ball-Stud Speed Clip Fasteners



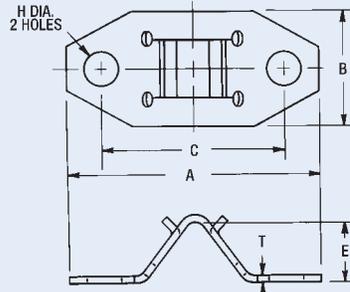
The **Speed Clip** is riveted in position on the panel with either plain or 100 degree counter-sunk head rivets.



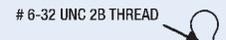
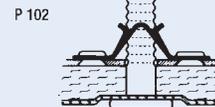
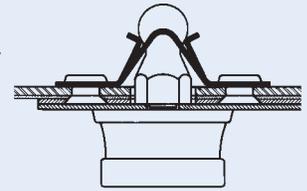
The **Ball-Stud** is riveted, bolted or screwed into the mating panel.



The panels are snapped together. Owing to the resiliency of the spring legs, misalignment resulting from a normal amount of manufacturing tolerances can be readily absorbed.



STANDARD
• NO RELIEF HOLES ON PRONG SHEARS



Request further Stud information from your Eaton representative.

H Hole Dia.	Des. Variation	Pull-Out Tension Stud Type		A Length	B Width	C Ctr. to	E Height	T Mat'l. Thick.	Part Number
		Ball	Serrated						
.105	Std.	3.5 lbs.	5 lbs.	.970	.440	.685	.220	.012	C4893-012
	Std.	8 lbs.	9 lbs.	.970	.440	.685	.220	.017	C4893-017
	Std.	12 lbs.	13 lbs.	.970	.440	.685	.220	.022	C4893-022
	Std.	18 lbs.	24 lbs.	.970	.440	.685	.220	.028	C4893-028
	Std.	30 lbs.	30 lbs.	.970	.440	.685	.220	.031	C4893-031
.135	Std.	3.5 lbs.	5 lbs.	.970	.440	.685	.220	.012	C1663-012
	Std.	8 lbs.	9 lbs.	.970	.440	.685	.220	.017	C1663-017
	Std.	8 lbs.	9 lbs.	.970	.440	.685	.220	.017	C1663SS-017
	Std.	12 lbs.	13 lbs.	.970	.440	.685	.220	.022	C1663-022
	Std.	18 lbs.	24 lbs.	.970	.440	.685	.220	.028	C1663-028
	Std.	18 lbs.	24 lbs.	.970	.440	.685	.220	.028	C1663SS-028
.140	A	17 lbs.	18 lbs.	1.060	.440	.750	.240	.020	C6273-020
	A	21 lbs.	22 lbs.	1.060	.440	.750	.240	.022	C6273-022
.145	Std.	3.5 lbs.	5 lbs.	.970	.440	.685	.220	.012	C4883-012
	Std.	8 lbs.	9 lbs.	.970	.440	.685	.220	.017	C4883-017
	Std.	12 lbs.	13 lbs.	.970	.440	.685	.220	.022	C4883-022
	Std.	18 lbs.	24 lbs.	.970	.440	.685	.220	.028	C4883-028
	Std.	30 lbs.	30 lbs.	.970	.440	.685	.220	.031	C4883-031
.156	Std.	50-65 lbs.	40 lbs.	.970	.440	.700	.220	.031	C40488-031 •

• No relief holes on prong shears.

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

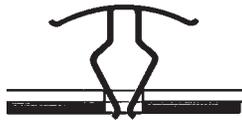


Dart-Type Fasteners

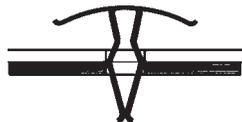
Tinnerman **Dart-Type Fasteners** are one of a group of **Speed Clip Fasteners** which are self-sufficient. That is, they require no screws, rivets, studs, welds or other secondary fastening devices. They require only a cavity or mounting hole. They can be applied from the front or top of a panel thereby eliminating many blind or limited access fastening problems. Being one-piece, they eliminate excessive small parts handling and parts inventories.

Once applied, live spring tension secures the components between the top and shoulders of the clip. The amount of clamping action here varies with the material thickness and design of the fastener. When required, most **Dart-Type Speed Clips** can be removed and reused.

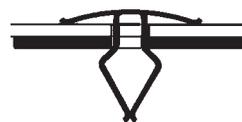
How to apply Dart-Type Speed Clip Fasteners



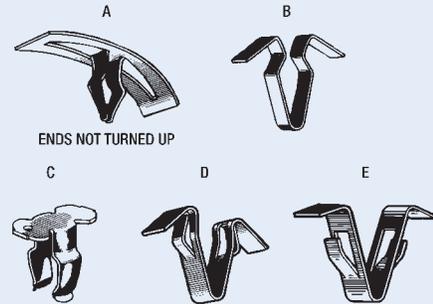
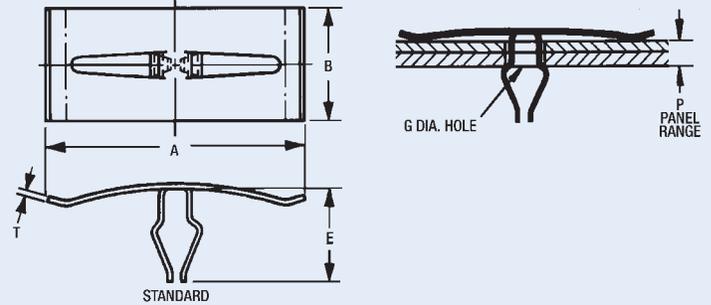
Position **Dart-Type** in mounting hole of panels or components to be secured.



As the clip is pushed into the mounting hole, spring arms compress.



As the shoulders clear the panels they expand. This constant attempt to regain its original shape develops live spring tension between the shoulders and the top of the clip – securing the panels between.



P Panel Range	Design Variation	A Length	B Width	E Height	G Panel Hole Dia.	T Mat'l. Thick.	Part Number
.031-.041	C	.550	.310	.500	.182-.192	.014	C29943-014
.050-.075	C	.550	.340	.490	.182-.192	.014	C22149-014
.050-.090	B	.875	.187	.400	.245-.255	.014	C57973-014
.054-.086	Std.	1.720	.340	.650	.186-.191	.014	C22395SS-014
.075-.150	A	1.050	.310	.390	.182-.192	.022	C3860-022
.093-.110	B	.410	.130	.560	.182-.192	.020	C26740-020
.095-.140	D	1.080	.220	.550	.307-.317	.017	C4792-017
.120-.130	C	.630	.190	.530	.213-.223	.022	C4925-022
.140-.160	B	.760	.130	.540	.182-.192	.014	C24258-014
.165-.185	Std.	1.690	.340	.620	.187-.192	.020	C4789-020
.185-.234	Std.	1.700	.340	.610	.187-.192	.017	C40617-017
.192-.212	B	.750	.130	.590	.182-.192	.014	C3822-014
.224-.244	C	.750	.310	.640	.307-.317	.025	C20341-025
.300-.400	Std.	1.700	.340	.590	.213-.223	.020	C43142SS-020



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in *italic*



Trim Clip Fasteners

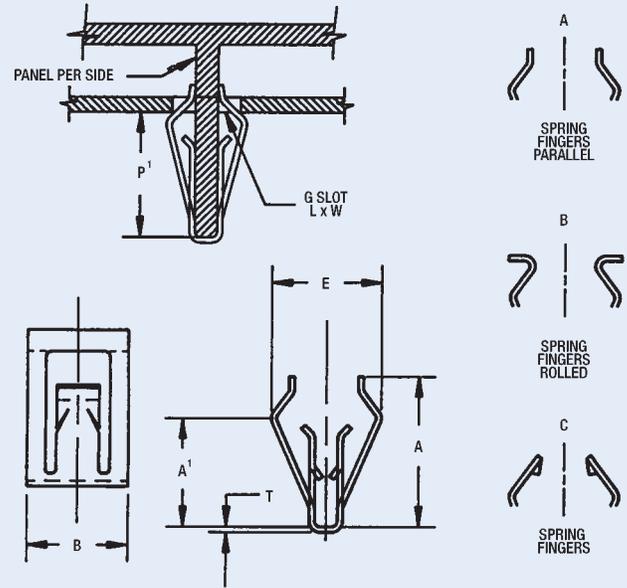
Trim Clip Fasteners recently introduced, these unique Tinnerman fasteners have real potential as a general purpose fastener.

Designed for use over rectangular studs or integrally molded blades, ribs, etc., on trim strips, access plates, or any light application where removability is a factor.

How to apply Trim Clip Fasteners

The **Trim Clip** is simply pressed over the stud, blade, rib, etc., with the barbed, u-shaped retaining legs fully seated. Then, as part of the strip or plate assembly, is pressed into assembled position on the panel, frame, door, appliance, or whatever.

Rectangular mounting holes or gaps between panel or frame members serve as anchor points for the clip. The self-equalizing retaining legs are formed into a dart-type configuration for easy mounting. They assure a snug, rattle free installation, yet will yield to deliberate removal force applied to the trim or plate.



P Panel Range	P1 Panel Des. Range Var.	A Leng.	A1 Leng.	B Width	E Height	G Mounting Hole	T Mat'l. Thick.	Part Number
1.000-1.500	2.500 - 3.000 B	16.200	10.400	10.000	10.700	8.500 x 16.000	.510	C57951-051M
1.120-1.380	---	B 18.200	10.700	10.000	9.000	6.000 x 12.000	.560	D98676-056M
1.170-1.430	6.460 - 6.460 C	9.500	4.600	10.500	7.800	6.250 x 11.000	.430	D98646-043M
1.250-1.750	---	A 12.000	5.100	17.800	6.100	5.400 x 25.400	.510	C57979-051M
	5.000 - 6.700 Std.	12.000	5.100	17.800	6.100	5.400 x 25.400	.510	C58179-051M
	5.700 - 5.700 B	13.000	5.500	11.000	6.100	5.400 x 25.400	.360	C58005-036M
1.300-1.800	8.000 - 8.000 C	12.900	4.700	11.000	6.100	5.300 x 25.400	.430	C57998-043M
	8.200 - 8.200 C	12.900	5.400	11.000	6.100	5.300 x 25.400	.430	C58306-043M
1.370-1.770	12.130 - 12.130C	16.500	10.200	10.000	12.000	8.250 x 20.000	.510	D98648-051M
1.600-2.000	---	C 15.100	6.250	10.250	12.000	8.250 x 20.000	.510	D98721-051M
1.700-2.000	---	A 14.880	6.750	10.000	12.700	8.000 x 18.000	.510	D98641-051M
1.700-2.100	---	A 16.000	9.140	10.000	12.800	8.250 x 16.000	.510	D98714-051M
	12.130 - 12.130A	16.500	10.200	10.000	12.500	8.250 x 16.000	.510	D98595-051M
	12.130 - 12.130A	16.500	10.200	10.000	12.500	8.250 x 16.000	.510	D98568-051M
	12.130 - 12.130A	16.500	10.200	10.000	12.500	8.250 x 16.000	.560	D98568-056M
	12.130 - 12.130B	16.500	10.200	10.000	12.500	8.250 x 16.000	.510	D98674-051M
	---	B 16.500	10.200	10.000	12.500	8.250 x 16.000	.510	D98640-051M
	---	B 14.550	8.800	10.000	14.000	10.800 x 19.200	.560	D98653-056M
1.800-2.250	---	A 14.250	10.400	10.000	10.700	8.500 x 16.000	.510	D98460-051M
	12.300 - 12.300B	14.250	10.400	10.500	10.700	8.500 x 16.000	.510	D98666-051M
2.000-2.250	---	A 7.400	4.500	10.500	7.500	5.500 x 12.700	.300	D98597-030M

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number.
 SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

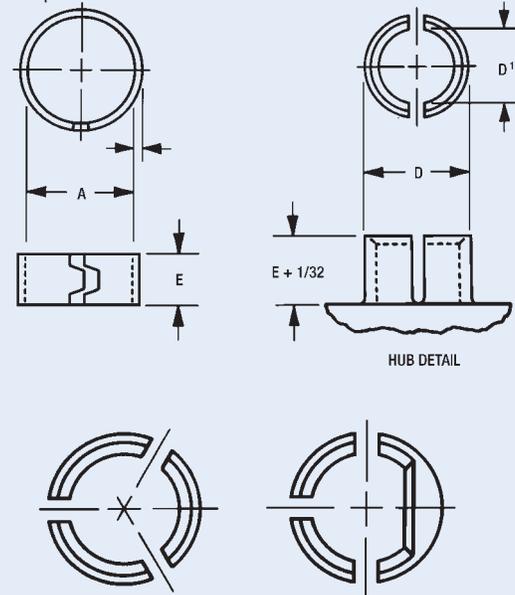


Knob-to-Shaft Fasteners (Compression Rings)

Self-retaining Tinnerman **Speed Clips** solve a host of **Knob-to-Shaft** assembly problems. They eliminate inserts and setscrews for reduced molding costs and easier, faster assembly. Stresses are distributed evenly around the hub during application while the strength and durability of spring steel reinforces critical wearing points and harnesses cold-flow tendencies. Knobs can be removed and replaced repeatedly without danger of loosening or developing “knob-wobble”.

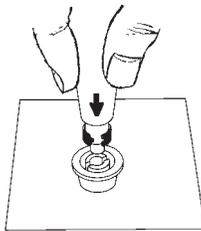
Two basic designs are available for standard applications. **Compression Rings** are for use on thermoplastic knobs with split hubs. They squeeze the hub around the shaft insuring firm, reliable retention. **Round, D-shaped or Knurled Shafts** can be used depending upon the hub cavity design. **“C” Clips** are recommended for die cast or thick-walled thermosetting plastic knobs. For use with D-shaped shafts only, they bear against the flat side of the shaft clamping it firmly within the hub cavity.

Where knob designs do not permit the use of either **Compression Rings** or **“C” Clips**, **Speed Clips** are available, or can be designed to fit within the knob cavity. Several variations are illustrated at the end of this section.



How to apply Knob-to-Shaft Speed Clip Fasteners

A simple tool picks up and expands the **Compression Ring**. The end of the tool is placed over the knob hub and the ring is transferred from the tool to the outer circumference of the hub in one easy motion. **“C” Clips** can be assembled over the hub with a similar tool or lightly rapped in place with a mallet. Data on these simple assembly tools is available on request.



D Hub O.D.	D1 Shaft Dia. Min.	Hub I.D. Max.	A Ring I.D.	E Ring Height	T Material Thickness	Part Number
.235 - .252	.125	.175	.220	.130	.017	C2133-017
.307 - .317	.182	.192	.280	.250	.014	C2304-014
.335 - .345	.245	.255	.300	.250	.014	C2122-014
.351 - .367	.219	.269	.320	.130	.017	C2684-017
.361 - .371	.234	.281	.320	.250	.014	C2401-014
.389 - .421	.272	.322	.370	.190	.028	C2155-028
.432 - .442	.375	.385	.410	.250	.017	C4101-017
.526 - .536	.362	.372	.470	.250	.025	C2166-025
.683 - .693	.558	.568	.600	.250	.020	D5794-020



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

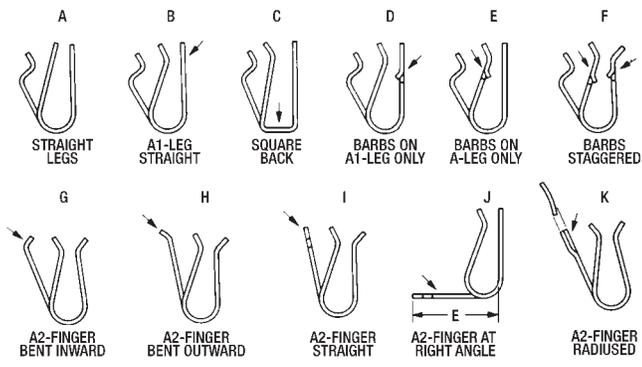
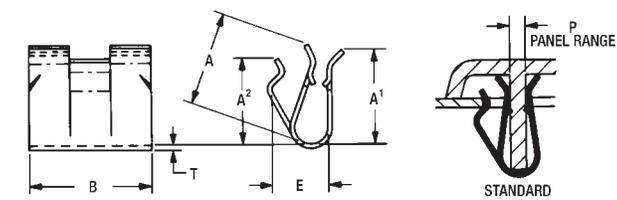
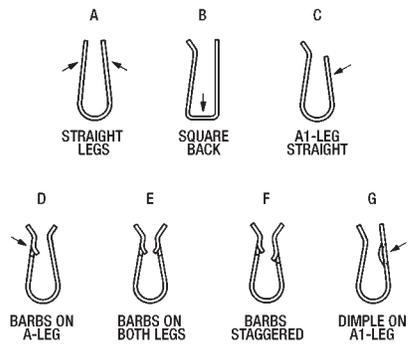
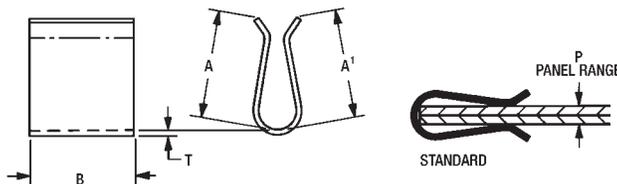
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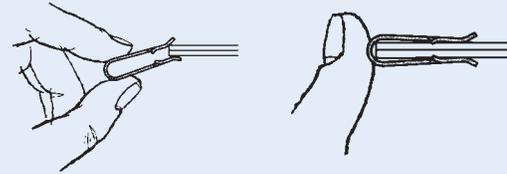
U-Type Fasteners (Standard)

Tinnerman **U-Type Speed Clip Fasteners** snap easily over metal, plastic or wooden panels providing a strong clamping action for firm, vibration-free assembly. They are self-sufficient requiring no holes, screws, welds, rivets or other secondary fastening devices. They are low cost, removable and reusable requiring only the simplest assembly procedure. Turned-up lead lips on one or both legs allow fast assembly over the panel edges. Some are equipped with barbs for positive retention of the panel.

Depending upon design, they can be used to clamp or hinge panels together, provide a removable spring catch, apply delicate spring tension on fragile surfaces, secure light components within cavities, etc. Fastening applications for these heat-treated, spring steel **Speed Clips** are limited only by the imagination.



How to apply U-Type Speed Clip Fasteners



Align panels to be secured and lead **U Clip** over the edges at a slight angle. Once both legs are started over the panel, simply press until fully seated.

P Panel Range	Design Variation	A	A1	B Width	T Mat'l. Thick.	Part Number
.015 - .060	F	.340	.340	.500	.014	C22503-014
<i>1.140 - 2.540</i>	<i>CD</i>	<i>11.680</i>	<i>9.700</i>	<i>19.050</i>	<i>.510</i>	<i>C57527-051M</i>
.046 - .056	ABE	.200	.200	.380	.014	C23928-014
.050 - .100	CE	.340	.350	.500	.017	C20285SS-017
.060 - .090	E	.390	.390	.500	.014	C21465-014
.080 - .140	CD	.350	.300	.380	.014	D98284-014
.093 - .187	CG	.360	.560	.220	.020	C21592-020
.100 - .156	D	.680	.680	.630	.025	C21457-025
.115 - .185	E	.420	.420	.500	.014	C27091-014
.125 - .187	F	.680	.660	.630	.025	C43978-025
<i>3.560 - 3.810</i>	<i>E</i>	<i>17.150</i>	<i>19.050</i>	<i>12.750</i>	<i>.430</i>	<i>C57997-043M</i>
.170 - .205	E	.430	.430	.500	.014	C43806-014
.245 - .255	BE	.360	.360	.500	.014	C45931-014
.320 - .340	BE	.270	.270	.500	.014	C56147-014

U-Type Fasteners (Special)

P Panel Range	Design Variation	A	A1	A2	B Width	E	T Mat'l. Thick.	Part Number
.025 - .035	BFI	.270	.300	.460	.500	.350	.014	C44140-014
<i>1.000 - 1.500</i>	<i>F</i>	<i>10.000</i>	<i>9.250</i>	<i>9.600</i>	<i>12.700</i>	<i>6.350</i>	<i>.430</i>	<i>D57067-043M</i>
.040 - .090	Std.	.340	.340	.340	.500	.210	.014	C2855SS-014
	Std.	.340	.340	.320	.500	.220	.014	C21449-014
.043 - .053	BFK	.200	.300	.280	.500	.510	.017	C25467-017
.055 - .065	BFH	.310	.310	.340	.500	.460	.014	C29019-014
.070 - .090	CD	.160	.160	.200	.375	.310	.012	C57854-012
.075 - .105	FH	.240	.410	.340	.500	.320	.014	C21527-014
.090 - .110	EI	.340	.340	.100	.750	.350	.017	D98327-017
.125 - .140	CFI	.210	.260	.240	.500	.435	.017	C57817-017
.150 - .160	FG	.300	.330	.400	.500	.290	.020	C43824SS-020

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number. SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

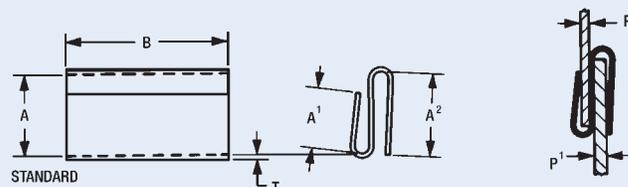
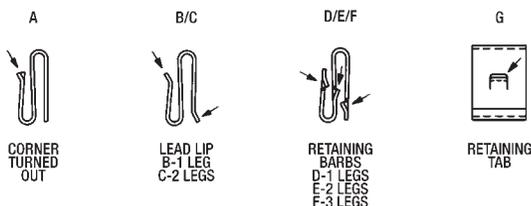


S-Clip Fasteners

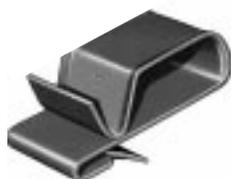
Tinnerman **S-Clip Fasteners** are used for attaching panels with a spring cushion fastening that prevents chipping or crazing from expansion or stains in handling of shipment. Eliminate holes in panels or flanges.

Design Variations

Parts shown as **Standard** or with **Design Variations** are available only in that particular design.



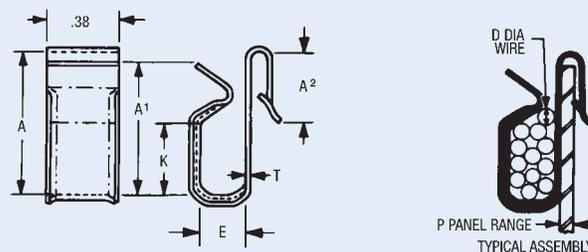
P Panel Range	P1 Panel Range	Des. Variation	A Length	A1 Short Leg	A2 Long Leg	B Width	T Mat'l. Thick.	Part Number
.026 - .032	.112 - .118	CE	.480	.450	.480	.380	.020	C53241-020
.036 - .044	.036 - .044	CG	.350	.360	.360	.380	.017	C24649-017
.042 - .066	.052 - .076	CD	.980	.680	.740	.500	.034	C56268-034
.048 - .065	.080 - .110	CF	.530	.400	.470	.380	.020	C44684-020
.070 - .080	.070 - .110	CF	.530	.390	.470	.380	.020	C48766-020
.090 - .130	.090 - .130	CE	.530	.390	.470	.380	.020	C55113-020
.105 - .146	.065 - .075	Std.	.540	.500	.560	1.130	.025	C3952-025
3.200 - 3.200	1.000 - 1.000	CF	9.950	12.750	7.150	7.500	.510	C58072-051M
.156 - .187	.050 - .080	BE	.980	.610	.760	.500	.025	C58156-025



Cable, Wire, Rod & Tube Clips

Tinnerman **Clips** offer the most efficient means of securing cable, wire and tubing safely away from danger areas. Made of high carbon **Spring Steel**, heat-treated, they are one-piece and self-retaining in most cases, requiring only a mounting hole, flange end or panel edge for fast easy installation. Available in several standard designs for a wide range of line diameters and panel thicknesses, many have rolled edges as an added safeguard against fraying or chafing. They can also be supplied with a dipped neoprene, cushion.

Though quick and simple to install, they provide positive retention for reliable, trouble-free service.



D	P	A	A1	A2	E	K	T	Part Number
.085-.095 (7)	.054-.089	.695	.655	.420	.205	.300	.017	D98281-017
	.115-.135	.700	.620	.410	.190	.290	.017	D22042-017
.085-.095 (12)	.025-.055	.830	.710	.400	.290	.430	.017	C20213-017
	.030-.050	.500	.740	.500	.390	.450	.017	C54949-017
.120-.130 (9)	.031-.086	.520	.750	.490	.390	.450	.017	D98274-017
	4.600-4.700(1)	2.290-3.050	15.240	14.230	9.650	4.830	5.840	.510
.245-.255 (1)	.054-.066	.700	.620	.460	.190	.290	.017	C23214-017
.270-.280(1)	.100-.120	.690	.630	.420	.230	.300	.020	C54337-020
.338-.348(1)	.083-.093	.810	.810	.400	.280	.410	.017	C26410-017



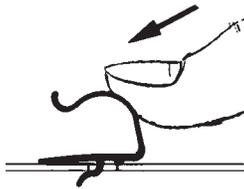
The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in italic

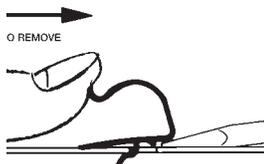


Cable, Wire, Rod & Tube Clips (continued)

How to apply Cable-Type Clips

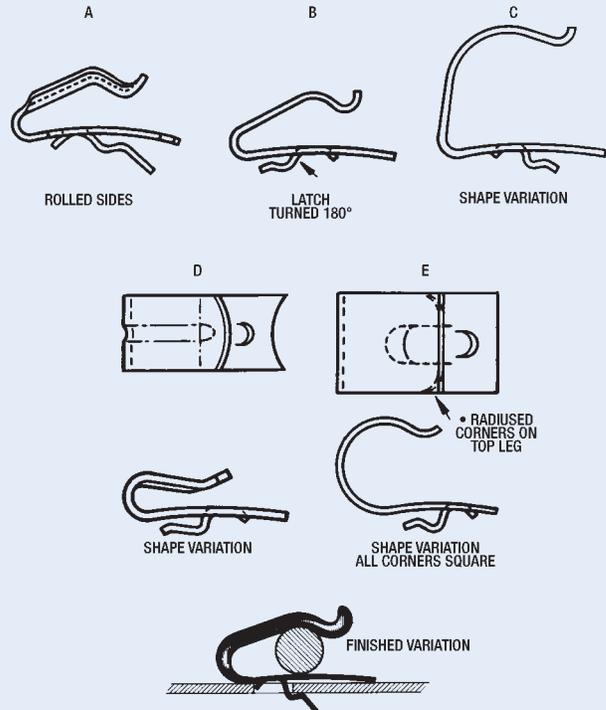


Clips provided with a self-retaining "heel and toe" impression are simply positioned in the mounting hole as shown above. Pressure at the back of the **Clip** forces it forward until the "heel" snaps into locked position. The cable, wire, etc. is then installed for final assembly.



To remove "heel and toe" **Clips** simply raise the fastener with a simple tool to release the "heel" and press rearward to disengage the toe. These fasteners can be re-used indefinitely.

Types with "U" shaped retaining legs are pressed over panel or flange ends and lock firmly in place.



Finish Variation

Where desired these **Speed Clips** can be furnished with a dipped neoprene cushion. To specify neoprene use -16 as the finish dash number.

Example: C20635-020-16

D Diameter	P Panel Range	Design Vari- ation	A Length	B Width	G Panel Hole Dia.	T Mat'l. Thick.	Part Number
.085-.095	.040-.051	BD	.760	.380	.281	.020	C20635SS-020
.125-.140	.078-.095	BD	.790	.380	.281	.020	C3966-020
.175-.185	.048-.054	A	.810	.500	.253	.017	C23150-017
.187-.250	.025-.040	Std.	.790	.500	.250	.022	C3958-022
<i>5.725-6.250</i>	<i>1.370-1.680</i>	<i>Std.</i>	<i>20.000</i>	<i>12.700</i>	<i>6.350</i>	<i>.560</i>	<i>C57515-056M</i>
.250-.312	.025-.035	B	.790	.500	.250	.022	C28461-022
.375-.406	.025-.040	Std.	.970	.630	.250	.025	C2832-025
.432-.442	.038-.062	BE*	.740	.500	.250	.025	C43025-025

Material: All parts are **Spring Steel**, heat treated, unless otherwise specified. The only variations available are those shown with suffix letters in the part number.
 SS – Stainless Steel BE – Beryllium Copper P – Phosphor Bronze

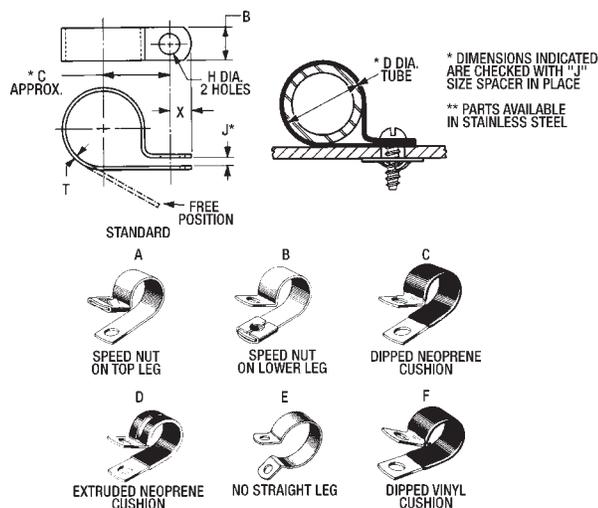


Tube, Harness & Hose Clamps

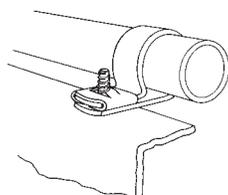
Tinnerman **Tube Clamps** for mounting tube, conduit, cable, wire or other cylindrically shaped objects are available for a wide range of diameters. Standard sizes range from .062" to 2.000" diameters. Larger sizes are available on special order. Made of top quality materials, Tinnerman **Tube-Type Clamps** provide strong, reliable retention and assure dimensional stability.

Available with dipped or extruded flame-resistant neoprene cushion to protect against abrasion or chafing, they can also be supplied with a self-retaining **Speed Nut Fastener** on one leg for easier, vibration-resistant installations. This feature offers a tremendous advantage in close quarters where loose or separate parts, such as nuts and lockwashers, create excessive small parts handling and unnecessary delays.

Special designs can be developed to meet special requirements. Many examples of such are shown here and on the following pages.



How to apply Tube-Type Clamps



The standard **Tube-Type Clamp** is formed to allow application over its prescribed tube diameter at any desired location without undue distortion. Once positioned on the tube, the screw is driven and the clamp legs draw together for a tight assembly. The **Speed Nut Fastener** shown in place on this clamp reduces parts handling and accelerates assembly. Tinnerman **Tube-Type Clamps** are available with or without the fastener in place.

D Tube Dia.	Des. Var.	H Hole Dia.	B Width	Speed Nut Size	C Ctr. to Ctr.	*J Spacer Thick.	X	T Mat'l. Alum.	Thick. Steel	Part Number
.062	Std.	.173	.380	—	.260	.031	.187	.020	.020	C2980-00**
.093	Std.	.173	.380	—	.290	.031	.187	.032	.031	C2980-0**
.125	Std.	.173	.380	—	.270	.031	.187	.032	.031	C2980-1**
.156	A	.173	.380	8Z	.310	.031	.187	.032	.031	C2981-2
.187	Std.	.199	.380	—	.330	.031	.187	.032	.031	C4886-3**
.250	Std.	.173	.380	—	.360	.031	.187	.032	.031	C2980-4**
	Std.	.199	.380	—	.360	.031	.187	.032	.031	C4886-4**
	A	.173	.380	8Z	.360	.031	.187	.032	.031	C2981-4
	C	.199	.380	—	.380	.031	.187	.032	.031	C4983-4
	F	.199	.380	—	.380	.031	.187	.032	.031	C32607-4
.312	Std.	.173	.380	—	.380	.031	.187	.032	.031	C2980-5**
	Std.	.199	.380	—	.380	.031	.187	.032	.031	C4886-5**
	A	.173	.380	8Z	.380	.031	.187	.032	.031	C2981-5
	C	.199	.380	—	.410	.031	.187	.032	.031	C4983-5
	AD	.173	.380	8Z	.410	.031	.187	.032	.031	C3047-5
.375	Std.	.173	.380	—	.410	.031	.187	.032	.031	C2980-6*
	Std.	.199	.380	—	.410	.031	.187	.032	.031	C4886-6*
	A	.173	.380	8Z	.410	.031	.187	.032	.031	C2981-6
	D	.173	.380	—	.430	.031	.187	.032	.031	C3046-6
	AC	.173	.380	8Z	.430	.031	.187	.032	.031	C3050-6
	AF	.173	.380	8Z	.430	.031	.187	.032	.031	C32601-6
.437	Std.	.173	.380	—	.430	.031	.187	.032	.031	C2980-7
.500	Std.	.173	.380	—	.470	.031	.187	.032	.031	C2980-8
	Std.	.199	.380	—	.470	.031	.187	.032	.031	C4886-8
	A	.173	.380	8Z	.470	.031	.187	.032	.031	C2981-8
	D	.173	.380	—	.480	.031	.187	.032	.031	C3046-8
	AD	.173	.380	8Z	.480	.031	.187	.032	.031	C3047-8
.562	AE	.173	.380	8Z	.530	.050	.187	.032	.031	C3053-9
.625	Std.	.203	.500	—	.640	.062	.250	—	.031	C41434-10
	A	.173	.380	8Z	.500	.062	.187	.032	.031	C2981-10
	AE	.173	.380	8Z	.580	.050	.187	.032	.031	C3053-10
	F	.199	.380	—	.550	.062	.187	.032	.031	C32607-10
.687	A	.173	.380	8Z	.540	.062	.250	.064	.031	C2981-11
	AC	.199	.500	10Z	.720	.062	.250	.064	.031	C3050-11
.750	Std.	.199	.500	—	.720	.062	.250	.064	.031	C2980-12
	BD	.199	.500	10Z	.720	.062	.250	.064	.031	C3048-12



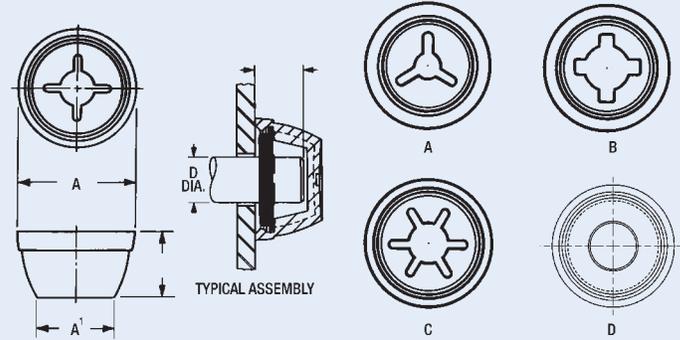
The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in italic

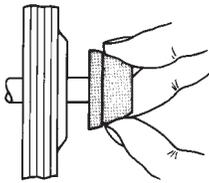


Cap Type Push-On Plastic Fasteners

Tinnerman® **Plastic Cap Nuts** combine the good looks and durability of high density linear polyethylene with the reliability of high carbon spring steel. Used over shaft, stud or rod ends for a multitude of uses they will enhance any product by adding color while providing dependable, vibration resistant assembly. Available in eight attractive standard colors, they may also be color matched in quantity orders. Wherever decorator colors are needed, colorful Tinnerman **Plastic Caps** can add substantially to a product sales appeal.



How to apply Cap Type Push-On Plastic Fasteners



Simply zipped down the axle, shaft or stud, the Tinnerman® spring steel insert bites hard for positive retention. Properly applied, the **Cap Nut** will never loosen and fall off.

D Stud Dia.	Design Variation	A Dia.	A1 Dia.	E Height	L Stud Depth	Part Number
.125	A	.650	.370	.350	.125-.250	C60002-125
.156	Std.	.650	.370	.350	.125-.250	C60002-156
.187	Std.	.650	.370	.350	.125-.235	C60002-187
.218	Std.	.650	.370	.350	.125-.170	C60002-218
	Std.	.835	.550	.460	.200-.343	C60008-218
.250	A	.650	.370	.350	.125-.150	C60202-250
	B	.650	.370	.350	.125-.150	C60002-250
	D	.650	.370	.350	.125-.150	C62349-250
	D	.650	.370	.350	.125-.150	C62301-250**
	Std.	.835	.550	.460	.200-.343	C60008-250
.281	C	1.250	.830	.650	.250-.468	C60929-250
	B	.650	.370	.350	.125-.130	C60002-281
.296	Std.	.835	.550	.460	.200-.343	C61297-296
.312	Std.	.835	.550	.460	.200-.343	C60008-312
.354	Std.	.835	.550	.460	.200-.343	C60008-354
.375	Std.	.835	.550	.460	.200-.343	C60008-375
	C	1.250	.830	.650	.250-.468	C60929-375
<i>10.000</i>	<i>Std.</i>	<i>21.209</i>	<i>13.970</i>	<i>11.684</i>	<i>5.080-8.712</i>	<i>C60008-1000M†</i>
.437	C	.835	.550	.460	.200-.343	C60008-437
	C	1.250	.830	.650	.250-.468	C60929-437
.500	C	.895	.610	.460	.200-.343	C61727-500
	C	1.250	.830	.650	.250-.468	C60929-500
.625	C	1.250	.830	.650	.250-.468	C60929-625

†Metric stud. Other metric sizes available on special order

**C62301-250 has Stainless Steel insert

Available Colors

Plastic Cap Fasteners are available in eight standard colors:

- | | |
|----------------|---------------|
| Natural (-801) | Black (-805) |
| White (-802) | Silver (-806) |
| Red (-803) | Yellow (-807) |
| Blue (-804) | Green (-808) |

When ordering, add the dash number shown next to color selected, to the part number. Example: C60002-125-801 (natural)

Material: Nylon (AA)
Finish: Natural

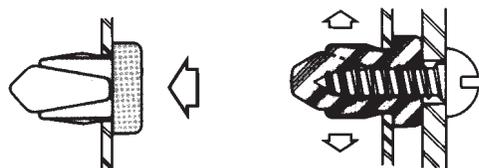


Expansion Type Plastic Fasteners

Tinnerman® **Expansion Nuts** are rugged little nylon fasteners with big advantages. Ideal for front mounted attachments, they are self-retained and fast and easy to apply. Used with No. 8 or No. 10 sheet metal screws, they resist up to 200 pounds pull. Completely enclosed in plastic, the screw threads are protected from corrosion or galvanic action. This also eliminates the danger of wire chafing or scratching on sharp screw cutting edges. Being nylon, **Expansion Nuts** offer excellent insulating qualities, both electrical and thermal.

Standard **Expansion Nuts** are available with spacer head heights from .031" to .600" and a panel range of .020" to .076". Design variations available for round and square head types include plastisol seals, oversized head dimensions, greater panel range, etc.

How to apply Expansion Type Plastic Fasteners



Simply pressed into the panel from the front side, the **Expansion Nut** is self-retained in screw receiving position. During assembly the driven screw expands the fastener behind the panel to which it is mounted, locking it in place and sealing the hole against moisture and dirt.

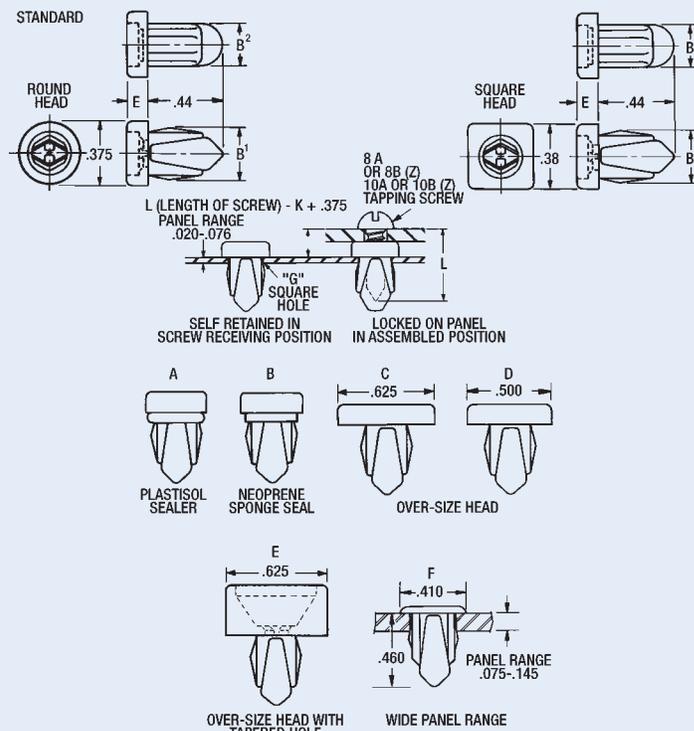


Toggle Type Plastic Fasteners

Tinnerman® nylon **Toggle Nuts** offer many assembly advantages that lead to important manufacturing cost savings. They are simple and fast to apply, provide thermal and electrical insulation, are shock and vibration resistant, and provide high shear and tensile strength.

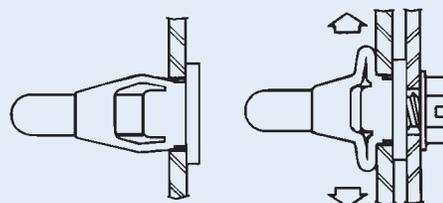
Standard "**Toggles**" have a generous panel range of .020" to .110" and offer a selection of integral spacer head heights up to 2.00" in 1/16" increments. They are corrosion proof, withstand a wide temperature range (-40° to 250°F) and have excellent dielectric properties. The mounting screw is enclosed in nylon to protect against wire chafing, scratching or galvanic action.

Variations on the standard design have been developed to meet specific needs. Some of these include special sealers, electrical connectors, oversized heads, extra panel range, extra torque values, etc.



E Head Height	Head Type	Des. Var.	B1	B2	G Sq. Mnt. Hole	Part Number
.031	Square	Std.	.305	.250	.250-.281	C60053AA-031
	Square	F	.290	.265	.265-.281	C61278AA-031
.062	Square	Std.	.305	.250	.250-.281	C60053AA-062
.100	Square	F	.290	.265	.265-.281	C61278AA-100
.250	Round	E	.305	.250	.250-.281	C61374AA-250

How to apply Toggle Type Plastic Fasteners



The "**Toggle**" snaps easily into place from the front side and is self-retained—ideal for blind attachments. As the screw is driven, the body of the fastener is drawn toward the head expanding flexible sides against the back side of the panel. Adjacent tabs are forced outward simultaneously to help seal the mounting hole against dust and moisture.

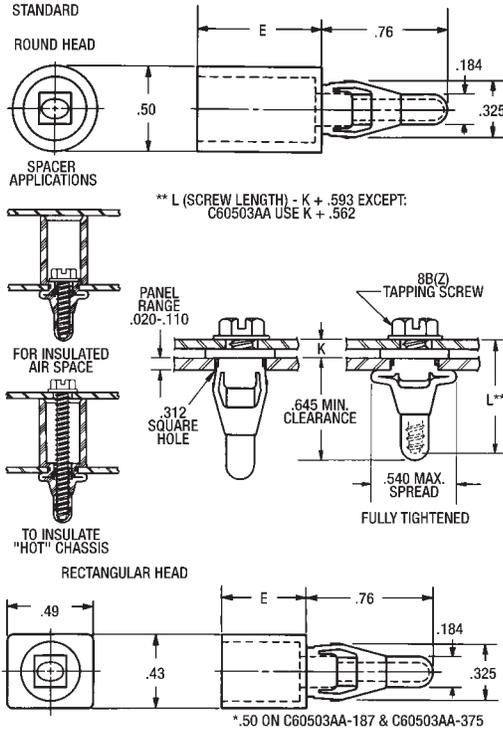


The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

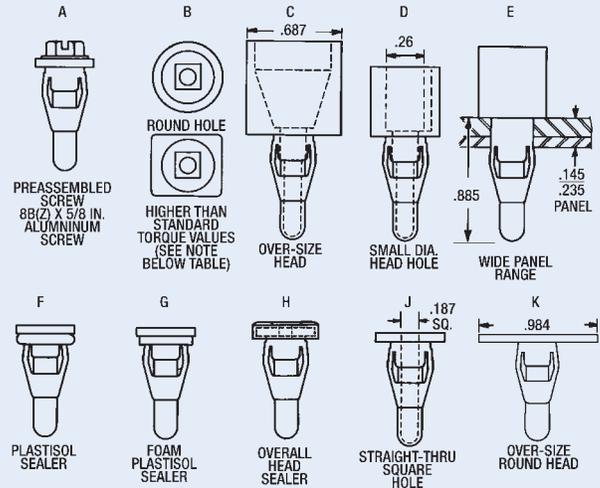
Metric parts listed in *italic>*



Toggle Type Plastic Fasteners (continued)

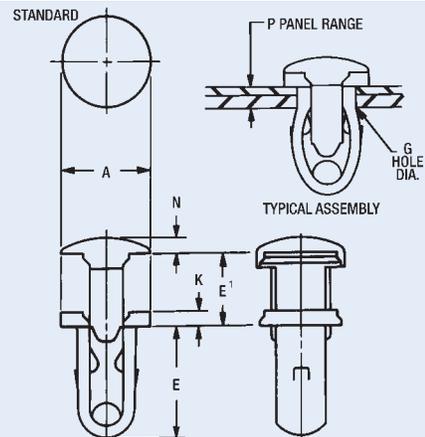


E Head Height	Head Type	Design Variation	Part Number
.031	Round	Std.	C60048AA-031
.062	Round	Std.	C60048AA-062
.125	Round	Std.	C60048AA-125
.187	Round	Std.	C60048AA-187
.250	Round	Std.	C60048AA-250
.375	Round	Std.	C60048AA-375
.500	Round	Std.	C60048AA-500
.625	Round	Std.	C60048AA-625
.750	Round	Std.	C60048AA-750



Clinch Type Plastic Fasteners

Tinnerman® **Clinch Type** Fasteners offer a host of assembly advantages. They are front-mounted, fast acting, and easy to apply. No special tools are required. Easily removed, yet may be reused without loss of holding power. Available in three sizes: for 1/8", 3/16", and 1/4" diameter mounting holes over a wide range of panel thicknesses. The **Clinch Type** fastener consists of a one-piece molding with two elements, a "T" shaped drive pin and a U-shaped expander which are joined by thin break-away web sections. The head is smooth with a low profile to give an attractive finished appearance, and they are available in natural or black nylon.



G Hole Dia.	P Panel Range	Des. Var.	A	E	E1	K	N	Part Number
.125	.020-.174	Std.	.250	.390	.235	.040	.040	C60203AA-020
.187	.020-.235	Std.	.370	.450	.350	.060	.060	C60207AA-020
	.020-.235	Std.	.370	.450	.350	.060	.060	C60207AD-020*
.250	.020-.174	Std.	.370	.470	.305	.060	.060	C60184AA-020
	.035-.250	B	.620	.550	.415	.060	.060	C60955AA-035

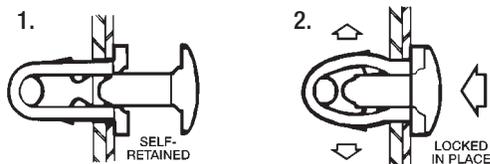
* Material: Polypropylene Copolymer

Material: Nylon (AA), Polypropylene Copolymer (AD)
Finish: Natural or Black

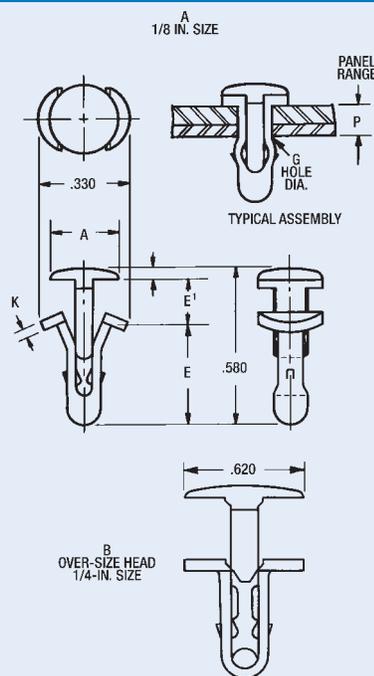


Clinch Type Plastic Fasteners

How to apply Clinch Type Plastic Fasteners



1. The "U" portion is inserted through the mounting hole. Tabs on sides of "U" provide self-retention to panels until seated.
2. The "T" shaped drive pin is then rapped lightly to bottom, expanding the sides of the "U" behind panels to lock securely in place.



Wire and Tube Retainers Plastic Fasteners

How to apply Polyclamp Fasteners

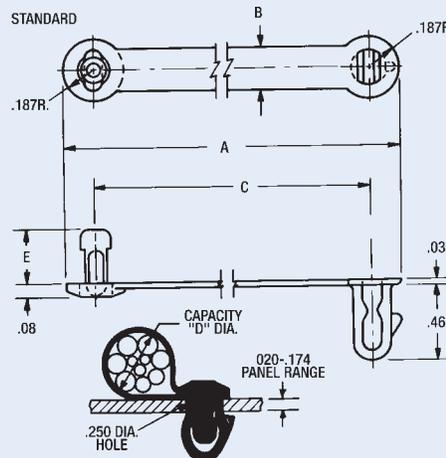


The "expander" is simply snapped into a 1/4" diameter panel hole from the front side. Retaining tab permits preassembly in any position.

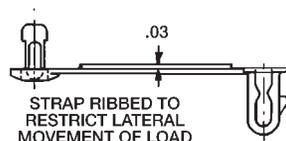
The strap wraps around the wire bundle, etc. and the lock pin presses to bottom as shown. Entry enlarges the expander behind the panel for firm, positive retention.

Design Variations

Parts shown as **Standard** or with **Design Variations** are available only in that particular design.



D Capacity (Dia.)	Des. Var.	C Center to Center	A Overall Length	B Width	E	Part Number
.312	Std.	1.500	1.875	.260	.340	C60387AD-5
.375	Std.	1.710	2.085	.260	.340	C60387AD-6
.437	Std.	1.920	2.295	.260	.340	C60387AD-7
.500	Std.	2.130	2.505	.260	.340	C60387AD-8
.562	Std.	2.340	2.715	.260	.340	C60387AD-9
.812	Std.	3.180	3.555	.260	.340	C60387AD-13
2.000	Std.	7.070	7.444	.310	.380	C61563AA-7
2.250	Std.	8.070	8.444	.310	.380	C61563AA-8
2.750	Std.	10.046	10.420	.310	.380	C61563AA-10



The dimensions of the above parts are envelope dimensions only. For complete design information, please request a blueprint from your Tinnerman representative or the Tinnerman Engineering department.

Metric parts listed in italic

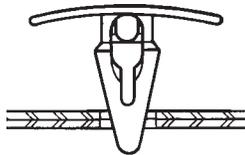


Button Head Dart Fasteners

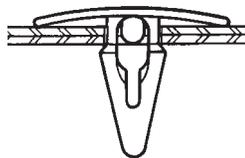
Button Head Dart Fasteners. These versatile plastic fasteners offer many diversified application possibilities. They may be used for light retention, as bumpers, hole plugs, bearings or spacers. Ideally suited for simplified assembly of products shipped knocked-down for consumer assembly. Available in different materials, head types and panel ranges.

In addition to the inherent advantage of being corrosion-proof, **Button Head Darts** are shock and vibration resistant, and will not work loose.

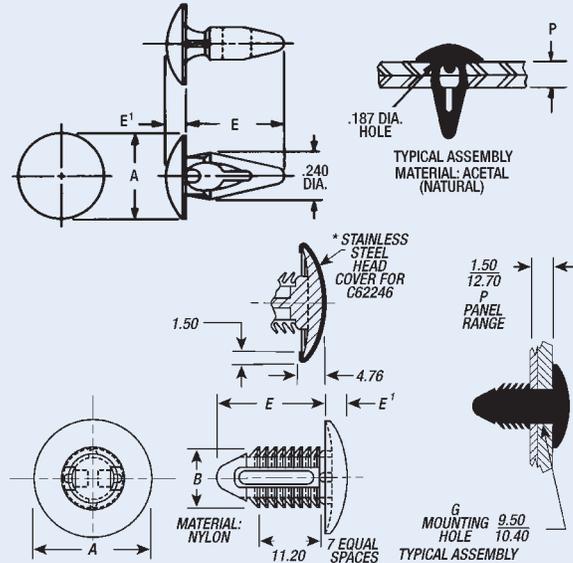
How to apply Button Head Dart Fasteners



Position **Button Head** in mounting hole of panels or components to be secured.



The tapered **Dart** guides panels into alignment as it is seated, leaving only the smooth **Button Head** exposed.



P Panel Range	Des. Var.	A	E	E1	Material (Natural)	Part Number
.035-.100	Std.	.420	.475	.100	Polypropylene	C61546AD-028
	Std.	.420	.475	.100	Acetal	C61546AG-028
	A	.305	.475	.050	Acetal	C62182AG-035
	B	.562	.475	.055	Nylon	C61809AA-035
1.520-2.540	A	11.310	15.110	1.580	Nylon	C62366AA-152M
.060-.100	A	.445	.595	.062	Nylon	C61782AA-060
.130-.180	Std.	.420	.555	.100	Nylon	C61622AA-130
	Std.	.420	.555	.100	Acetal	C61622AG-130
.170-.234	A	.420	.595	.050	Nylon	C61375AA-170
	A	.420	.595	.050	Acetal	C61375AG-170
	A	.445	.595	.062	Nylon	C61612AA-170
	A	.445	.595	.062	Polypropylene	C61612AD-170
	A	.445	.595	.062	Nylon	C61758AA-170
	A	.445	.595	.062	Nylon	C61758AA-170
	A	.445	.595	.062	Acetal	C61758AG-170