

BODY HARDWARE DEFINITIONS AND USAGE

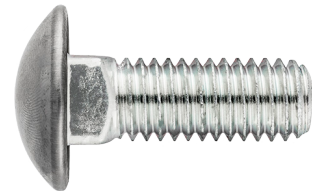
Barrel Nuts: They are used with either stud-type or threaded fasteners where the other side of the panel is inaccessible. Typical applications include automotive nameplates on fenders, trunks, etc. The nut snaps into a pre-drilled hole and the metal tabs lock it into place. Also called tubular nuts.



Body Bolts: Usually either a hex washer head or hex head Sems® with the most common thread types being USS coarse or metric regular pitch. They are used for attachment of fenders, radiators, hoods, trunks and general purpose fastening.



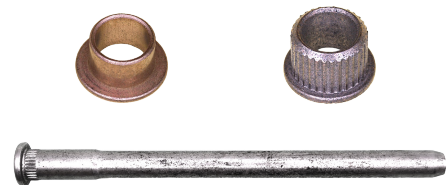
Bumper Bolts: Used to attach bumpers. They have either a USS coarse or metric regular pitch thread. Bumper bolts are usually zinc plated with a stainless steel capped head.



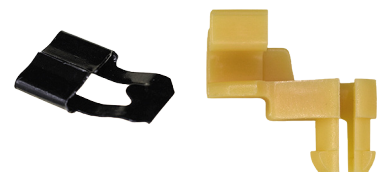
Cable Straps (Releasable): Made of either natural or black nylon. Used to bundle wires or harnesses. With a releasable tab that allows you to loosen or tighten the strap as needed.



Door Hinge Pins & Bushings: Components of the vehicle's door hinge assembly. Pins are made of steel or stainless steel. The bushings are made of bronze. The critical dimensions of the pins are the length, the diameter and the shoulder diameter (if applicable). The critical dimensions of the bushings are the inside diameter and the outside diameter. Some bushings have a splined outside diameter.



Door Lock Rod Clips: Used to attach the door lock rod to the door lock cylinder. The clips are made of either steel or nylon.



Door & Window Crank Handle Retaining Clip:

Usually made of copper plated spring steel, they are used to attach interior door and window crank handles.



Double End Drill Bits: For drilling holes for rivets or removing rivets. The double end feature gives you twice the "life" of the bit.



Extruded U-Nuts: Used on the edge of a panel so that the throat of the nut lines up with a hole in the panel. They allow for a certain degree of alignment before installation. The multi-thread feature gives it more strength and retention than a regular single thread U or J-nut. They have either a USS coarse thread or metric regular pitch thread. Extruded U-nuts are used with body bolts on door panels, hood hinges, fenders, radiators and for general purpose fastening.



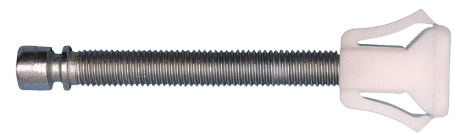
Flat Nuts: Made of spring steel and used where the other side of the panel is easy to reach. They can be for either stud type or threaded fasteners. They are used throughout the car under the dashboard, in door panels, trunk area, fenders, etc.



Free Spinning Washer Nut: A hex nut with a captive free spinning washer. As the nut is tightened against a surface, a "wedging action" is produced to create a tight friction locking action. Some nuts may have grounding "teeth" on the underside of the washer. These nuts are available in both standard USS coarse and SAE fine thread as well as metric regular pitch. They are used with body bolts.



Headlight Adjusting Screw Assemblies: Two assemblies are usually required for each vehicle headlight. One assembly controls the vertical aiming and the other controls the horizontal aiming.



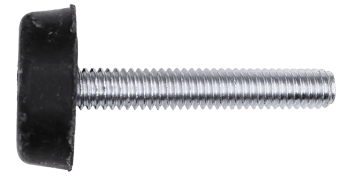
Headlight Component Retaining Clip: Used in the retention of Ford vehicle headlight components starting in 1989



Hex Flange Nuts: A standard hex nut with a "washer" permanently attached. Provides for greater retention than a standard hex nut because of the larger load bearing area.



Hood Adjusting Bolt & Bumper: A threaded steel bolt with a “captive” rubber bumper head. The bolt screws into the vehicle body and the rubber bumper portion softens the impact when the vehicle hood is closed.



J-Nuts: Shaped like the letter J. They are used the same as extruded U-nuts on the edge of a panel. Depending upon the thread size, they can be used with tapping screws or body bolts in instrument panels, under the hood for light-duty applications and door panels.



Expansion Nuts: For attaching outside rear view mirrors, roof racks, etc. They are installed into the sheet metal and then as a bolt is tightened, the body of the expansion nut collapses to form legs which grip the inside of the sheet metal. Auveco has a installation tool available for installing multiple nuts in a short period of time. Sometimes they have a plastisol sealer around the exposed part to form a water-tight seal.



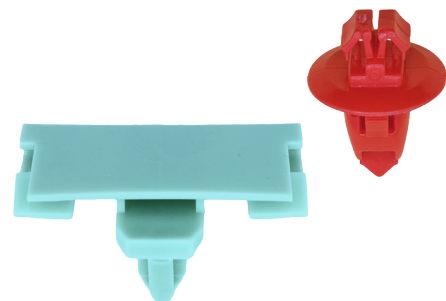
License Plate Screws: Used to attach license plates. Can have either a tapping screw thread or a machine screw thread. Made of either steel (plated) or nylon.



Miscellaneous (Grille, Fascias, etc.) Fasteners: Usually made of steel and plated. There are numerous types of these fasteners that are used to attach radiator grilles, fascias, garnish moulding etc.



Moulding Clips: Used for attaching mouldings on doors, quarter panels, trunks, etc. They are made of nylon and are sometimes attached with a rivet or with a special tapping screw.



Nylon Nuts: Used with metal tapping screws throughout the car (interior & exterior) for attachment. As a tapping screw is installed, it cuts its own thread and spreads the bottom part of the nut apart securing it in place. Nylon nuts can be found in door panels, headlight/front-end applications, license plate brackets, arm rests, instrument panels and many other areas.



Push-On Retainers: A spring steel fastener that is pushed onto a non-threaded stud to grip it firmly.



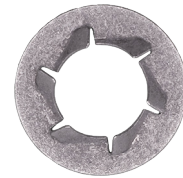
Push-Type Retainers: They work by pushing in the center pin which spreads the prongs. They are used for retaining bumper guards, various fascia, splash shields, shrouds, etc. While they are designed to be reusable, they are made of nylon and are usually destroyed in a collision. They are sometimes referred to as rivet retainers or drive-type retainers.



Plug Buttons: Made of black polyethylene. They are used to plug holes in body panels.



Pushnut Bolt Retainers: A spring steel fastener that is pushed onto a screw or bolt to temporarily hold it in place until final assembly. They slide down smoothly on either fine, coarse or regular pitch threads and hold firmly at any point.



Retaining Clips: Used for retaining door panels, interior trim, hood insulation, weatherstrip, splash guards, headliners and various fascia. Although OEM interior retainers come in a large variety of colors, the aftermarket parts are usually black or natural nylon. The body shop paints them to match the application as needed. There are several different variations of design. These parts are usually destroyed when removed.



Reveal Moulding Clips: Used for attaching reveal moulding around windshields, back and side windows. Clips are held in place with a tapping screw, stud or rivet. The moulding snaps onto the clip.



Rivets: Used for attachment in many different areas. The critical dimensions are the diameter of the rivet body and the grip range or panel thickness. There's no way to determine what the grip range is by measuring the rivet. That's an engineered specification that has to be given. Rivets can be made of steel, stainless steel, aluminum or nylon (usually black). The mandrel is the part that breaks off when the rivet is installed.

Rubber Caps: Made of special heat resistant EPDM rubber. Used for capping lines and hoses when testing carburetors, emission control systems, vacuum lines, etc. and to cover exposed threads.

Screw Grommets: A variation of the nylon nut. They are used with metal tapping screws throughout the vehicle (interior and exterior). They're installed in a pre-punched hole or slot in sheet metal. The tapping screw cuts its own thread as it's installed. They are mostly found in Japanese cars.

Sems®: A screw/bolt with a free spinning washer attached to it. As the screw is tightened a "wedging action" is produced to create a tight friction locking action. The Sems® feature is found on both body bolts and tapping screws.

Shims: Made of low carbon, non-heat treated steel. They are used for wheel alignment as well as spacers in the alignment of hoods, panels, etc. The critical dimensions are the thickness (1/64", 1/32", 1/16", 1/8") and the slot width.

Speed Nut: A term for a variety of types of nuts. Refer to flat nuts, barrel nuts, U-nuts, J-nuts, tubular nuts and extruded U-nuts.

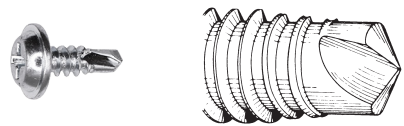
Spin Lock Nuts: A hex flange nut with serrations under the flange for locking purposes. The serrations or grooves dig into the bearing surface during final tightening. They are used with body bolts.



Tapping or Trim Screws: Generally used for retention of interior and exterior mouldings, trim, dash panels, etc. Can be used with nylon nuts, screw grommets or installed directly into sheet metal. They cut or form a thread when driven into a performed hole. There are many varieties available - Phillips flat top washer head, pan head, Phillips oval head, hex head, hex washer head, etc. you can have Phillips oval head screws with undersized heads such as a #8 screw with a #6 head. Such a screw is used where the original fasteners was a #6 screw but now needs to be replaced with a #8 screw yet the application still requires a #6 head.



Teks®: A screw with a drill point that drills its own hole as it is installed. Most Auveco Teks® screws have a #2 point which is recommended for material up to .110" thick. The higher the drill point number, the thicker that material it can drill through. Once the metal is penetrated, the Teks® fastener functions as a conventional tapping screws.



Thread Cutting Nuts: A flanged type fastener nut with a hex drive that cuts its own thread when installed on a mild steel, brass, aluminum or plastic stud. Because of their prevailing torque, they provide excellent vibration resistance. They can be found on instrument panels, trunk area, fenders, door panels, etc.



Torx®: A drive system on screws and bolts that features six points. Can be either an internal or external Torx®. The Torx® system is a more positive drive system than a Phillips or slotted.



Trim Panel Clips & Fasteners: Can be made of metal or nylon. Used for retaining door and interior trim panels. The head of the fastener slides into a slit in the trim panel and then the fastener stem is pushed into a hole in the sheet metal. These parts are often damaged when removed.



Tubular Nuts: They are used with either stud-type or threaded fasteners where the other side of the panel is inaccessible. Typical applications include automotive nameplates on fenders, trunks, etc. The nut snaps into a pre-drilled hole and the metal tabs lock it into place. They are also called barrel nuts.



U-Nuts: Used the same as extruded U-nuts, on the edge of a panel, but do not possess the same “retention power” due to the lack of the extruded feature. Depending upon the thread size, can be used with tapping screws or body bolts in door panels, under the dash and light duty under the hood applications.

Universal Moulding Fasteners: A universal type of fastener for attaching older style mouldings that have lips or curls on the underside. The spring steel arm provides the tension holding the moulding strip. With the perforated plate type, you can break off the plate at 1/16” intervals to fit the moulding. You need to be able to access the back of the panel so you can install a hex nut.

Washer Head: A screw/bolt with the washer permanently attached to it. Also called flanged head. The washer head eliminates the need for a separate washer while increasing the load bearing area of the head. Used under the hood, on fenders, doors, front end applications, etc.

Washer Lock Nuts: Integral washers on these fasteners span slots or clearance holes. The spring locking action and the resilience of the washer provides a firm fastening when assembled with a screw or bolt. They are used in instrument panels, doors, trunks, etc.

Rubber Nuts: Primarily used to attach luggage racks but ideal for many other applications. Consists of a flanged neoprene rubber bushing with a brass machine nut molded into one end. Tightening a conventional machine screw threaded in the brass nut causes the insert to expand, making a secure fastening.

Wire Loom Clips: Used to hold wire loom (split flexible tubing) in place on underhood applications.

“Xmas Tree” Retainers: Used for retaining door panels, interior trim, hood insulation, weatherstrip, splash guards, headliners and various fascia. Although OEM interior retainers come in a large variety of colors, the aftermarket parts are usually black or natural nylon. The body shop paints them to match the application as needed. There are several different variations of design. The multi-head type twists into a slit on the trim panel and then the stem gets popped into a hole in the sheet metal. These parts are usually destroyed when removed.



Bolt: Externally threaded, headed fastener. Difference between a bolt and a screw: a bolt is generally used through a hole with a mating nut. A screw is used in a threaded hole without a nut.

Class of Thread: A system to distinguish thread tolerance differences. Classes 1A, 2A, and 3A apply to external threads. 1B, 2B, and 3B apply to internal threads. Classes 2 and 3 apply to both external and internal threads.

Crest: Outermost tip of male thread from the fastener cylinder, or innermost tip of female thread.

Driving Recess: Recess in the fastener head designed to accept a driving tool.

External Thread: Male thread. Thread outside of the cylinder surface.

Internal Thread: Female thread. Thread on the inside surface of a cylinder or cone.

Left-Hand Thread: Thread that winds counter-clockwise from the starting end of a fastener.

Right-Hand Thread: Thread that winds clockwise from the starting end of a fastener (viewed from starting end).

Major Diameter: Largest diameter of a screw thread on a straight thread. It is the diameter of an imaginary cylinder which would pass through the crest of an external thread or the root of an internal thread.

Minor Diameter: On a straight thread it is the diameter of an imaginary cylinder bounding the root of an external thread or the crest of an internal thread.

Nominal Diameter: Basic diameter that determines the size and dimensional limits of fasteners.

Pitch: Distance from a point of a screw thread to a corresponding point on the next thread measured parallel to the axis.

Screw: Headed fastener which is externally threaded.

Sems®: Pre-assembled screw and washer assemblies. Washers are placed on screws before roll threading. Threads of larger diameter than the washer hole thus prevent the washer from slipping off the screw.

Stud: Threaded rod at both ends or for entire length.

Tapping Screw: Hardened thread screw made to cut or form its own mating thread in an untapped hole.

Teks®: Screw which drills its own hole and then threads in.

Thread Pitch: Distance from the crest of one thread to the crest of another.

PLATINGS AND FINISHES

Finish	Color	Anti-Corrosion Properties	Characteristics and Uses	
Black Oxide	Black	Good (Interior Only): 8 Hour Salt Spray	Most Metals	Decorative finish. Used only on interior applications.
Black Zinc	Black	Excellent: 48 Hour Salt Spray	All Metals	Rich and lustrous. With or without lacquering.
Cadmium	Bright Silver-Gray Dull or Burnished	Very Good: 24 Hour Salt Spray	Most Metals	Non-porous metallic plating. Rich appearance, good rust resistance, low cost, good electrical conductivity. Bright silver-gray dull gray or black electroplated finish.
Chromium (Chrome)	Bright Blue-White	Excellent: 24 Hour Salt Spray	All Metals	Used when a beautiful finish is desired. Bright blue-white lustrous appearance. Electroplated.
Dichromate Dip	Rainbow	Excellent	All Metals	A yellow, brown, green or iridescent colored coating. Increases rust resistance. Add to Zinc or Cadmium plating.
E-Coat	Black	Excellent: 168 Hour Salt Spray	All Metals	Added protection containing corrosion inhibitors. Excellent for exterior applications.
Iridite	Green, Blue, Olive drab, Red, Bronze or Black	Excellent	All Metals	Coloring dip which adds rust resistance. Usually applied on Zinc or Cadmium.
JS-500	Chrome like luster	Excellent: 500 Hour Salt Spray	All Metals	Outstanding corrosion resistant finish that provides economical corrosion protection without adversely affecting dimensions.
Mechanical Zinc	Gray	Very Good: 48 Hour Salt Spray	All Metals	A chemical process of rust-proofing steel.
Nickel	Silver	Very Good: 24 Hour Salt Spray	All Metals	A hard, stable, dull white or bright burnished finish. Used for appliances and hardware.
Parkerized	Black	Excellent: 72 Hour Salt Spray	Ferrous Metals	Added protection when oiled with non-drying petroleum oil containing corrosion inhibitors. Good lubricity.
Phosphating	Dull, Gray, Black, or Blue	Excellent: 24 Hour Salt Spray	Ferrous Metals	A chemical process of rust-proofing steel.
Passivating		Excellent	Stainless Steels	For stainless steels. A nitric acid dip to remove foreign material and brighten finish.
Zinc Electrogalvanized	Gray	Very Good: 24 Hour Salt Spray	All Metals	Good rust resistance, appearance & low cost.
Zinc Electroplated	Blue to Blue-White-Gray	Very Good: 24 Hour Salt Spray	All Metals	Commonly used finish.

HEAD STYLES



Binding: undercut unless otherwise specified. Not rec for phillips recess



Fillister: deep slot used for counter bored holes



Flat Fillister: same as standard fillister without oval top



Flat 82+: used where flush surface is desired



Flat 100+: larger head than 82° used for thin metal soft plastic



Flat Trim: same as 82+ except diameter and countersink depth reduced



Flat Undercut: standard 82+ with lower 1/3 countersink removed for short screws



Hexagon: manufactured as trim hex or indented hex



Hex Washer: same as hexagon with washer section



Oval: same as flat head with rounded surface for appearance



Oval Undercut: similar to flat undercut with rounded surface



Oval Trim: same as oval, smaller diameter and countersink



Pan: recommended to replace round, truss binder



Round: general purpose (see pan head)



Round Countersunk: bolts only. Similar to flat head with no driving recess



Round Washer: same as round head with integral washer for bearing surface.



Square: bolts only. Large bearing surface for wrench tightening



Square Countersunk: for use on plow bolts



Square (Set Screw): recommended for high torque assembly



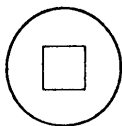
Truss: similar to round head with larger diameter (see pan head)

HEAD STYLES

Cross-Recessed (Phillips)



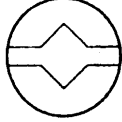
Square Socket



Pozi Drive



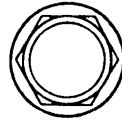
Slot & Square Socket



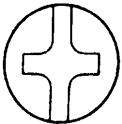
Frearson



Indent Hex Washer



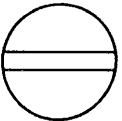
Phillips & Slot



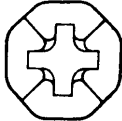
Indent Slotted Hex Washer



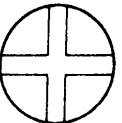
Slot



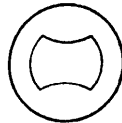
Phillips Pyramid



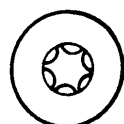
Cross-Slot



Clutch



Torx®



POINT STYLES

Type AB



Type 17



Type BP



Type A



Type B



Type BT(25)



Type C



Type T(23)



Type D(1)



Type F



Type G



Type BF



Type U



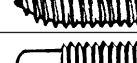
Type TT



Type CA

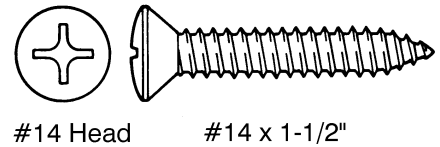
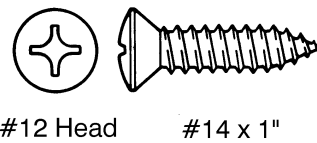
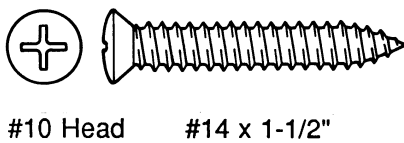
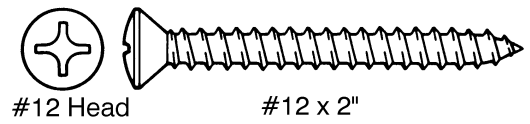
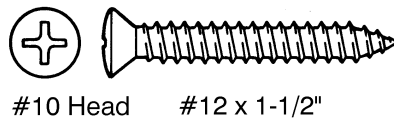
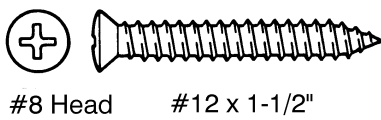
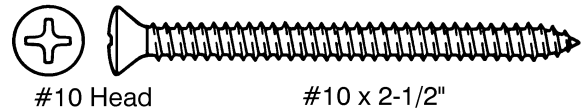
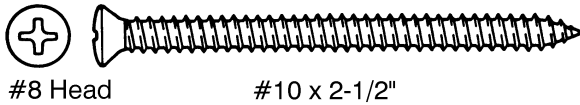
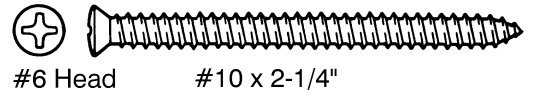
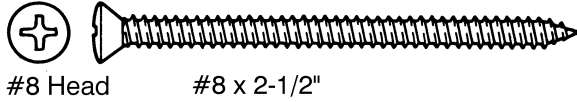
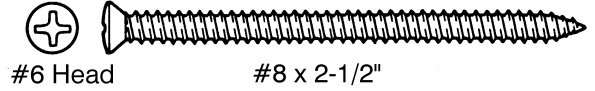
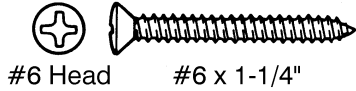
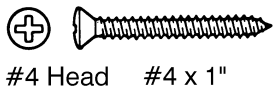


Dog Point

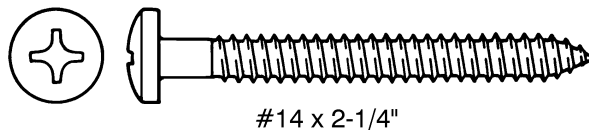
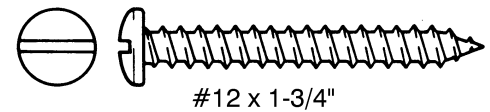
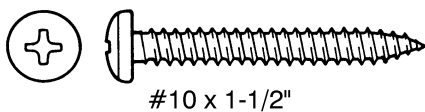
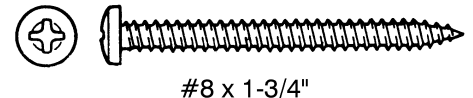
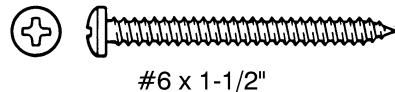
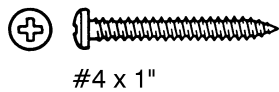


TAPPING SCREWS

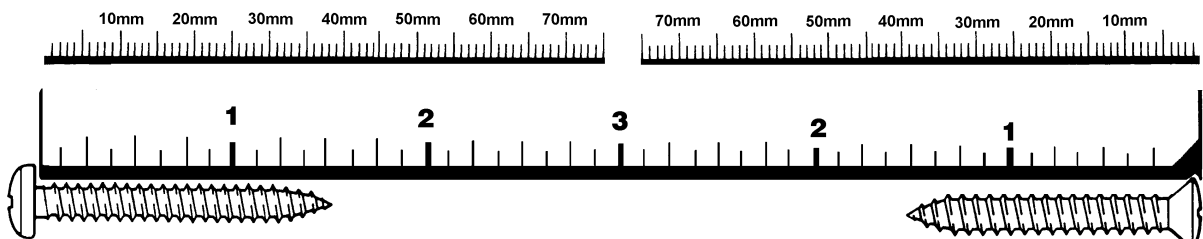
Oval Head Tapping Screws



PAN HEAD TAPPING SCREWS



HOW TO MEASURE TAPPING SCREWS



Place Pan Head, Hex Head or Hex Washer Head Screws at this end to measure the length (under the head)

Place Oval Head or Flat Head Screws in the blackened area to measure the length

METRIC ITEM CONVERSION CHART

Inch Fractions and Decimals to Metric Equivalents

Inches			Inches			Inches		
Fractions	Decimals	mm	Fractions	Decimals	mm	Fractions	Decimals	mm
----	.0004	.01	31/64	.48437	12.303	----	1.1417	29
----	.004	.10	----	.492	12.5	1-5/32	1.156	29.369
----	.01	.25	1/2	.500	12.700	----	1.1811	30
1/64	.0156	.397	----	.5118	13	1-3/16	1.1875	30.163
----	.0197	.50	33/64	.5156	13.097	1-7/32	1.219	30.956
----	.0295	.75	17/32	.53125	13.494	----	1.2205	31
1/32	.03125	.794	35/64	.54687	13.891	1-1/4	1.250	31.750
----	.0394	1	----	.5512	14	----	1.2598	32
3/64	.0469	1.191	9/16	.5625	14.288	1-9/32	1.281	32.544
----	.059	1.5	----	.571	14.5	----	1.2992	33
1/16	.0625	1.588	37/64	.57812	14.684	1-5/16	1.312	33.338
5/64	.0781	1.984	----	.5906	15	----	1.3386	34
----	.0787	2	19/32	.59375	15.081	1-11/32	1.344	34.131
3/32	.094	2.381	39/64	.60937	15.478	1-3/8	1.375	34.925
----	.0984	2.5	5/8	.6250	15.875	----	1.3779	35
7/64	.1093	2.776	----	.6299	16	1-13/32	1.406	35.719
----	.1181	3	41/64	.6406	16.272	----	1.4173	36
1/8	.1250	3.175	----	.6496	16.5	1-7/16	1.438	36.513
----	.1378	3.5	21/32	.65625	16.669	----	1.4567	37
9/64	.1406	3.572	----	.6693	17	1-15/32	1.469	37.306
5/32	.15625	3.969	43/64	.67187	17.066	----	1.4961	38
----	.1575	4	11/16	.6875	17.463	1-1/2	1.500	38.100
11/64	.17187	4.366	45/64	.7031	17.859	1-17/32	1.531	38.894
----	.177	4.5	----	.7087	18	----	1.5354	39
3/16	.1875	4.763	23/32	.71875	18.256	1-9/16	1.562	39.688
----	.1969	5	----	.7283	18.5	----	1.5748	40
13/64	.2031	5.159	47/64	.73437	18.653	1-19/32	1.594	40.481
----	.2165	5.5	----	.7480	19	----	1.6142	41
7/32	.21875	5.556	3/4	.7500	19.050	1-5/8	1.625	41.275
15/64	.23437	5.953	49/64	.7656	19.447	----	1.6535	42
----	.2362	6	25/32	.78125	19.844	1-21/32	1.6562	42.069
1/4	.2500	6.350	----	.7874	20	1-11/16	1.6875	42.863
----	.2559	6.5	51/64	.79687	20.241	----	1.6929	43
17/64	.2656	6.747	13/16	.8125	20.638	1-21/32	1.719	43.656
----	.2756	7	----	.8268	21	----	1.7323	44
9/32	.28125	7.144	53/64	.8281	21.034	1-3/4	1.750	44.450
----	.2953	7.5	27/32	.84375	21.431	----	1.7717	45
19/64	.29687	7.541	55/64	.85937	21.828	1-25/32	1.781	45.244
5/16	.3125	7.938	----	.8662	22	----	1.8110	46
----	.3150	8	7/8	.8750	22.225	1-13/16	1.8125	46.038
21/64	.3281	8.334	57/64	.8906	22.622	1-27/32	1.844	46.831
----	.335	8.5	----	.9055	23	----	1.8504	47
11/32	.34375	8.731	29/32	.90625	23.019	1-7/8	1.875	47.625
----	.3543	9	59/64	.92187	23.416	----	1.8898	48
23/64	.35937	9.128	15/16	.9375	23.813	1-29/32	1.9062	48.419
----	.374	9.5	----	.9449	24	----	1.9291	49
3/8	.3750	9.525	61/64	.9531	24.209	1-15/16	1.9375	49.213
25/64	.3906	9.922	31/32	.96875	24.606	----	1.9685	50
----	.3937	10	----	.9843	25	1-31/32	1.969	50.006
13/32	.4062	10.319	1	1.000	25.4	2	2.000	50.800
----	.413	10.5	----	1.0236	26	----	2.0079	51
27/64	.42187	10.716	1-1/32	1.0312	26.194	----	2.0472	52
----	.4331	11	1-1/16	1.062	26.988	2-1/16	2.062	52.388
7/16	.4375	11.113	----	1.063	27	----	2.0866	53
29/64	.4531	11.509	1-3/32	1.094	27.781	2-1/8	2.125	53.975
15/32	.46875	11.906	----	1.1024	28	----	2.126	54
----	.4724	12	1-1/8	1.125	28.575	----	2.165	55

METRIC ITEM CONVERSION CHART

Oval Head Tapping Screws

Inch Fractions and Decimals to Metric Equivalents

Inches			Inches			Inches		
Fractions	Decimals	mm	Fractions	Decimals	mm	Fractions	Decimals	mm
2-3/16	2.1875	55.563	----	3.1496	80	4-1/4	4.250	107.950
----	2.2047	56	3-3/16	3.1875	80.963	4-5/16	4.312	109.538
----	2.244	57	----	3.1890	81	----	4.3307	110
2-1/4	2.250	57.150	----	3.2283	82	4-3/8	4.375	111.125
----	2.2835	58	3-1/4	3.250	82.550	4-7/16	4.438	112.713
2/5-16	2.312	58.738	----	3.2677	83	4-1/2	4.500	114.300
----	2.3228	59	----	3.3071	84	----	4.5275	115
----	2.3622	60	3-5/16	3.312	84.1377	4-9/16	4.562	115.888
2-3/8	2.375	60.325	----	3.3464	85	4-5/8	4.625	117.475
----	2.4016	61	3-3/8	3.375	85.725	----	4.7244	120
2-7/16	2.438	61.913	----	3.3858	86	4-3/4	4.750	120.650
----	2.4409	62	----	3.4252	87	4-7/8	4.875	123.825
----	2.4803	63	3-7/16	3.438	87.313	----	4.9212	125
2-1/2	2.500	63.500	----	3.4646	88	5	5.000	127
----	2.5197	64	3-1/2	3.500	88.900	----	5.1181	130
----	2.559	65	----	3.5039	89	5-1/4	5.250	133.350
2-9/16	2.562	65.088	----	3.5433	90	5-1/2	5.500	139.700
----	2.5984	66	3-9/16	3.562	90.4877	----	5.5118	140
2-5/8	2.625	66.675	----	3.5827	91	5-3/4	5.750	146.050
----	2.638	67	----	3.622	92	----	5.9055	150
----	2.6772	68	3-5/8	3.625	92.075	6	6.00	152.400
2-11/16	2.6875	68.263	----	3.6614	93	6-1/4	6.250	158.750
----	2.7165	69	3-11/16	3.6875	93.663	----	6.2992	160
2-3/4	2.750	69.850	----	3.7008	94	6-1/2	6.500	165.100
----	2.7559	70	----	3.7401	95	----	6.6929	170
----	2.7953	71	3-3/4	3.750	95.250	6-3/4	6.750	171.450
2-13/16	2.8125	71.438	----	3.7795	96	7	7.000	177.800
----	2.8346	72	3-13/16	3.8125	96.838	----	7.0866	180
----	2.8740	73	----	3.8189	97	----	7.4803	190
2-7/8	2.875	73.025	----	3.8583	98	7-1/2	7.500	190.500
----	2.9134	74	3-7/8	3.875	98.425	----	7.8740	200
2-15/16	2.9375	74.613	----	3.8976	99	8	8.000	203.200
----	2.9527	75	----	3.9370	100	----	8.2677	210
----	2.9921	76	3-15/16	3.9375	100.013	8-1/2	8.500	215.900
3	3.000	76.200	----	3.9764	101	----	8.6614	220
----	3.0315	77	4	4.000	101.600	9	9.000	228.600
3-1/16	3.062	77.788	4-1/16	4.062	103.188	----	9.0551	230
----	3.0709	78	4-1/8	4.125	104.775	----	9.4488	240
----	3.1102	79	----	4.1338	105	9-1/2	9.500	241.300
3-1/8	3.125	79.375	4-3/16	4.1875	106.363	----	9.8425	250

U.S. STANDARD GAUGE CHART

Gauge	Decimal Size	Gauge	Decimal Size	Gauge	Decimal Size	Gauge	Decimal Size
7	.188"	14	.078"	21	.034"	28	.016"
8	.172"	15	.070"	22	.031"	29	.014"
9	.156"	16	.063"	23	.028"	30	.013"
10	.141"	17	.056"	24	.025"	31	.011"
11	.125"	18	.050"	25	.022"		
12	.109"	19	.044"	26	.019"		
13	.094"	20	.038"	27	.017"		