



# JUZER ENGINEERING & CO.

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## SCREW THREAD INSERTS



Screw Thread Inserts (STI) are helically wound from 304 (18-8) stainless steel wire cold rolled into a diamond shaped cross section, available in five standard lengths of 1, 1.5, 2, 2.5 & 3 times of the nominal thread diameter in different materials like S.S. (316), Inconel, Nimonic 90, Phosphor bronze, Spring steel grade manufactured for every thread form - ISO Metric, UNC, UNF, BSW, BSF, BSC, BSP, BA, NPT widely used by industries like Automotive, Electronic, Aerospace, Ship Building, Defence, Power Generation, Transport, Heavy manufacturing Equipment.

**STI are available in two forms - Standard free running form, Screw lock internal thread locking.**

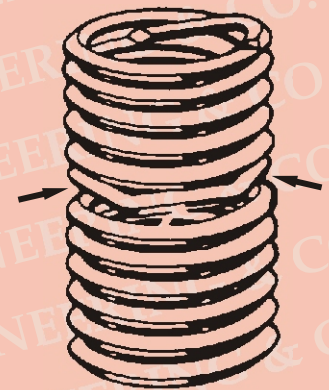
**Standard free running** form are rolled from high quality stainless steel wire with a diamond shaped cross section wound to the shape of a spring thread. Once the wire is wound into a helical coil and installed into a tapped hole, it provides a permanent and wear resistant thread in the parent material that is generally stronger than the original thread. The inserts are designed to be compress as they are installed. This allows maximum surface contact area with the tapped thread, safely and permanently fixing the inserts into place. The inserts compensatory action shares the load over the entire bolt and hole increasing holding or pull out strength. With a STI in place, load and stress are more evenly distributed.

**Screw lock Inserts** are designed to provide a screw - locking feature which will retain screws or bolts under the most severe vibration or varying temperature conditions. The insert locking configuration comprises of a series of uniquely designed locking chords which, upon the engagement of a screw or bolt, deflect radially, sufficiently enough to permit the installation of the bolt. Upon bolt entry, these straight segments are flexed outwardly, creating pressure on the bolt. This pressure is applied between the flanks of the bolt thread so that contact area is maximized. Each STI 'screw - locking' insert type has a specifically designed locking configuration. This ensures that the insert meets its design specification requirements. Therefore the shape, depth and number of locking chords will inevitably vary for differing thread types and sizes.

**Std. Free Running**



**Screw Lock**



### STI TAPS

STI taps differ from standard taps dimensionally and only STI screw thread insert taps are suitable for STI. They are manufactured to precise standards from either High Speed Steel (HSS) or (HSS - E) with ground threads and are available with taper, intermediate and bottoming leads. They have a larger diameter, but the same pitch as a standard tap

in order to accommodate the thread insert. Spiral point and spiral flute machine taps are also available for volume production purposes. For all spark plug application pilot nose taps are recommended and are available for common metric thread sizes. The STI thread insert when installed into a correctly tapped hole with applicable internal thread tolerance for the installed bolt.

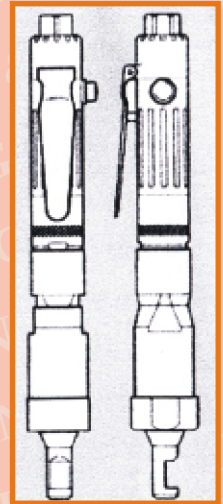
**Thread Class :** Metric Thread Class : 5H (Medium fit)  
4H5H (Close fit)  
Unified Thread Class : 2B (Medium fit)  
3B (Close fit)

**Types of Taps available :** Roughing, Plug/Second, Bottoming Straight flute short machine taps, Spiral flute, Spiral point & Pilot Nose are also available.

**STI Gauges :** "GO NOGO" STI gauges are recommended for gauging the tapped holes for precision fit.

**STI Tools :** Prewinder type inserting tool for STI installation, Tang Break Off tool for removing STI tang, Extracting tool for STI removal.

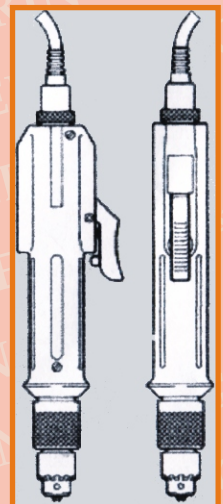
Pneumatic Inserting Tool



**Pneumatic & Electric installation tools are also available for volume production.**

**Screw Thread Insert Kits are also available for thread repairing consisting of 304 (18-8) inserts, Tap, Drill, Inserting Tool, Tang Break Off Tool, Extracting Tool.**

Electric Inserting Tool



## Keyserts:

They provide easy to install thread assembly to replace damaged, Stripped or worn threads in a wide range of materials including castings, forgings and mechanical components except cast iron or sintered materials. Made from tough high quality carbon steel or stainless steel, Keyserts are especially suitable for use in heavy wear and high vibration situations such as mining and earth moving equipment. Keyserts are available in light Weight, heavy duty, extra heavy duty and solid types in metric and imperial thread forms. Each Keyserts features either three or four locking keys providing a positive mechanical lock and preventing rotation and torsion. Whatever the project, Keyserts are renowned for reliability under the toughest conditions.





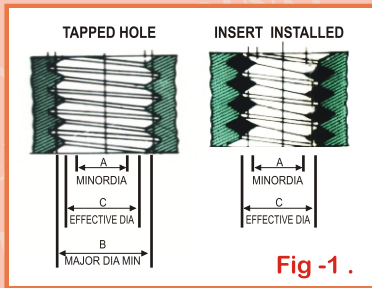


Fig -1.

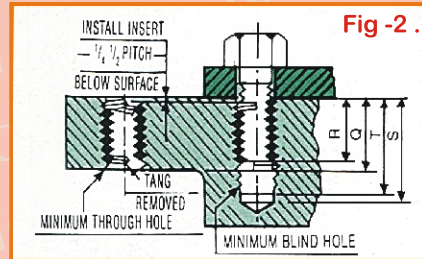


Fig -2.

## FORMULAE FOR CALCULATING MINIMUM DRILLING & TAPPING DEPTHS

P = PITCH in MM.

Q = Minimum full form tapped thread length. Values for Q are the same as the values listed in columns 2 to 8

R = Entering portion of Screw (max.) if tang is not removed =  $Q - 1P$ .

S = Drill Depth (min.) excluding point.

=  $Q + 4 \frac{1}{2} P$  (if finishing taps are used).

or  $S = Q + 2 \frac{1}{2} P$  (if bottoming taps are used).

T = Tap depth (min)

=  $Q + 3 \frac{1}{2} P$  (If finishing taps are used)

or  $T = Q + 1 \frac{1}{2} P$  (If bottoming taps are used)

Depths of counterbores or countersinks, if any, must be added to values for Q,R,S & T

### Screw Thread Insert

ISO	NOMINAL THREAD SIZE		BASIC LENGTHS "Q" MM Equal to length of minimum through hole, or minimum length of full form thread in blind hole. Actual Length of assembled insert equals basic length less 1/2 pitch. <div>See Fig-2.</div>								TAPPED HOLE & FITTED SIZE DATA FOR INSERTS MM <div>See Fig-1.</div>							DRILL	
			1.	2.	3.	4.	5.	6.	7.	8.	9.		10.	11.		12.			
METRIC COARSE SERIES	DIA. MM.	PITCH MM.	0.5 DIA	0.75 DIA	1.0 DIA	1.5 DIA	2 DIA	2.5 DIA	3 DIA	A		B	C		D		E	RECOMME- NDED SIZE	ALTERNATIVE SIZE
	M2	0.4			2	3	4	5	6	MAX.	MIN.	MIN.	MAX.	MIN.	MAX.	MIN.	MIN.		
	M2.2	0.45			2.2	3.3	4.4	5.5	6.6	2.40	2.30	2.785	2.532	2.492	1.968	1.908	1.71	2.3	2.35
	M2.5	0.45			2.5	3.8	5.0	6.3	7.5	2.70	2.60	3.085	2.832	2.792	2.268	2.208	2.01	2.6	2.65
	M3	0.5			3	4.5	6	7.5	9	3.22	3.11	3.611	3.367	3.325	2.738	2.675	2.46	3.1	3.2
	M4	0.7			4	6	8	10	12	4.29	4.15	4.842	4.509	4.455	3.620	3.545	3.24	4.1	4.2
	M5	0.8			5	7.5	10	12.5	15	5.33	5.17	5.954	5.577	5.520	4.560	4.480	4.13	5.1	5.2
	M6	1			6	9	12	15	18	6.41	6.22	7.187	6.719	6.650	5.445	5.350	4.92	6.2	6.3
	M7	1			7	10.5	14	17.5	21	7.41	7.22	8.187	7.719	7.650	6.445	6.350	5.92	7.2	7.3
	M8	1.25			8	12	16	20	24	8.48	8.27	9.465	8.886	8.812	7.288	7.188	6.65	8.2	8.3
	M10	1.5			10	15	20	25	30	10.56	10.32	11.751	11.061	10.974	9.138	9.026	8.38	10.2	10.3
	M12	1.75			12	18	24	30	36	12.64	12.38	14.040	13.236	13.137	10.988	10.863	10.11	12.25	31/64"
	M14	2			14	21	28	35	42	14.73	14.43	16.322	15.406	15.299	12.833	12.701	11.84	14.25	14.5
	M16	2	8	12	16	24	32	40	48	16.73	16.43	18.322	17.406	17.299	14.833	14.701	13.84	16.25	16.5
	M18	2.5	9	13.5	18	27	36	45	54	18.90	18.54	20.873	19.738	19.624	16.516	16.376	15.29	18.5	18.75
	M20	2.5	10	15	20	30	40	50	60	20.90	20.54	22.873	21.738	21.624	18.516	18.376	17.29	20.5	20.75
	M22	2.5	11	16.5	22	33	44	55	66	22.90	22.54	24.873	23.738	23.624	20.516	20.376	19.29	22.5	22.75
	M24	3	12	18	24	36	48	60	72	25.05	24.65	27.447	26.093	25.948	22.221	22.051	20.75	24.5	24.75
	M27	3	13.5	20.25	27	40.5	54			28.05	27.65	30.447	29.093	28.948	25.221	25.051	23.75	27.5	27.75
	M30	3.5	15	22.5	30	45	60			31.21	30.76	34.000	32.428	32.273	27.907	27.727	26.21	30.5	30.75
	M33	3.5	16.5	24.75	33	49.5	66			34.21	33.76	37.000	35.428	35.273	30.907	30.727	29.21	33.5	33.75
	M36	4	18	27	36	54	72			37.34	36.87	40.553	38.763	38.598	33.592	33.402	31.67	36.75	37.0
	M39	4	19.5	29.25	39	58.5	78			40.34	39.87	43.553	41.763	41.598	36.592	36.402	34.67	39.75	40.0
	METRIC FINE SERIES	M8	1			8	12	16	20	24	8.41	8.22	9.187	8.719	8.650	7.445	7.350	6.92	8.2
M 10		1.25			10	15	20	25	30	10.48	10.27	11.465	10.886	10.812	9.288	9.188	8.65	10.2	10.3
M 12		1.25			12	18	24	30	36	12.48	12.27	13.477	12.898	12.812	11.300	11.188	10.65	12.2	12.3
M 14		1.5			14	21	28	35	42	14.56	14.32	15.761	15.067	14.974	13.144	13.026	12.38	14.25	9/16"
M 16		1.5	8	12	16	24	32			16.56	16.32	17.761	17.067	16.974	15.144	15.026	14.38	16.25	41/64"
M 18		1.5	9	13.5	18	27	36			18.56	18.32	19.761	19.067	18.974	17.144	17.0256	16.38	18.25	
M 20		1.5	10	15	20	30	40			20.56	20.32	21.761	21.067	20.974	19.144	19.026	18.38	20.25	
M 22		1.5	11	16.5	22	33	44			22.56	22.32	23.761	23.067	22.974	21.144	21.026	20.38	22.25	
M 24		2	12	18	24	36	48			24.73	24.43	26.332	25.414	25.299	22.841	22.701	21.84	24.25	24.5
M 27		2	13.5	20.25	27	40.5				27.83	27.43	29.332	28.414	28.299	25.841	25.701	24.84	27.25	27.5
M 30		2	15	22.5	30	45				30.88	30.43	32.332	31.414	31.299	28.841	28.701	27.84	30.25	30.5
M 33		2	16.5	24.75	33	49.5				33.88	33.43	35.332	34.414	34.299	31.841	31.701	30.84	33.25	33.5
M 36		3	18	27	36	54				37.05	36.65	39.447	38.093	37.948	34.221	34.051	32.75	36.5	36.75
M 39		3	19.5	29.25	39	58.5				40.05	39.65	42.447	41.093	40.948	37.221	37.051	35.75	39.5	39.75
SPARK PLUG SERIES			Basic Length 'Q'																
	M 14	1.25	7.5 (for body reach 9.5)		10.5 (for body reach 12.7)		17 for body reach 19)			14.48	14.27	15.477	14.898	14.812	14.300	13.188	12.65	14.25	9/16"
	M 18	1.5	10.5 (for body reach 12.7)		12.0 (for body reach 14)					18.56	18.32	19.761	19.067	18.974	17.144	17.026	16.38	18.25	

## INSTALLATION PROCEDURE



### DRILLING

Standard Drilling procedure has to be followed refer Page 3.  
Recommended size (Col. 14) is for Aluminium, Alternative size (Col. 15) is for Steel, Plastic



### TAPPING

Tapping is usually done in a single operation with one of the types of finishing taps. Roughing taps are available, however, for occasions when tough materials make both rough and finish cuts necessary.



### GAUGING

Clean tapped hole. Use required thread gauge to check size and full thread depth in conventional manner for precision fit.



### INSTALLING INSERTS

Prewinder Type inserting Tools are available for hand installation of Inserts. The Prewinder Type is Precision tool which aligns and precompresses the insert for easy installation. A slotted mandrel in the tool drives the insert by its tang. This tool is recommended for hand installation of all sizes of Coarse & Fine Series of inserts.

\* Pneumatic & Electric Installation tools are also available



### REMOVING INSERT TANGS

The tang on a Insert should be removed after installation only when necessary for screw clearance or product appearance, and in such cases notched inserts should be used. This is easily accomplished by placing the punch of the Tang Break Off Tool into the installed insert and resting tool squarely on the insert tang. Strike the top of the tool with a hammer, using a sharp blow. (Fig. 6)



### EXTRACTING INSERTS

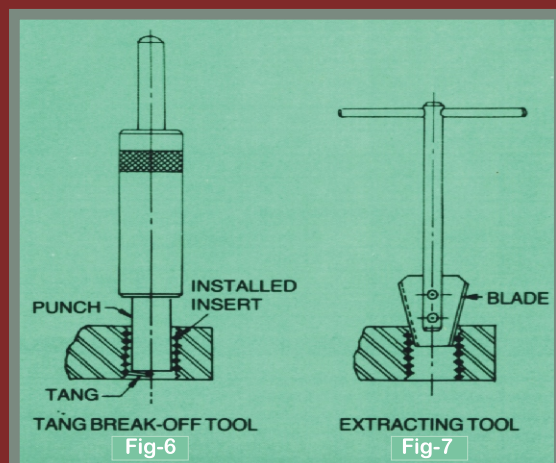
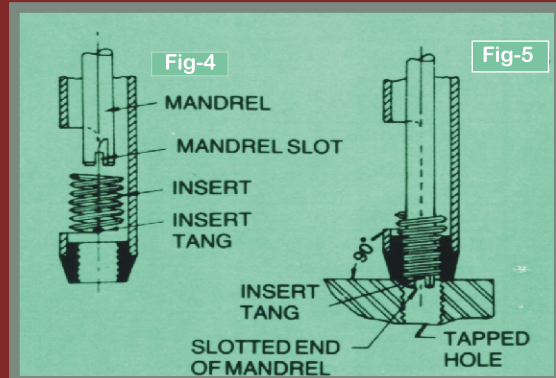
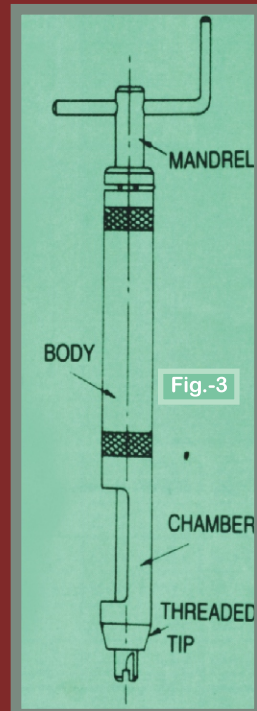
In rare instances, inserts are installed too deep, cross-threaded or otherwise improperly inserted. Such inserts are readily removed with Extracting Tools which are available in four sizes to fit all sizes of inserts. Place the blade of the extracting tool into the insert as shown in Fig. 7. Hit the top of the tool with a hammer, causing the blade to bite into the insert. Push down on the tool and rotate counterclockwise to back the insert out of the hole. ( Inserts produce permanent threads ; hence extraction is not normally necessary)

## METHOD OF USING THE PREWINDER TYPE INSERTING TOOL

To use Pre-winder Type inserting Tool. (Fig.3) retract mandrel and place insert in chamber with tang end towards threaded tip of tool (Fig. 4)

Advance the mandrel until slot fully engages the insert tang. Rotate and advance the mandrel protrudes 1 mm from tip. Hold tool firmly and squarely against work (Fig. 5) and install insert into tapped hole by rotating mandrel at a slow, uniform rate, until the top coil of the insert is 1/4 to 1/2 turn below top surface of hole. DO NOT PUSH ON/OR REVERSE MANDREL TO REMOVE TANG. When inserts are installed in small parts which can be held in hand, the Inserting Tool should preferably be mounted in a vice and the work brought to the tool.

PREWINDER TYPE INSERTING TOOL



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