

# HeliCoil

## Insert Systems



**Emhart**<sup>®</sup>  
**Teknologies**  
HELI-COIL

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# HeliCoil

## Wire Inserts

Heli-Coil<sup>®</sup> precision formed wire inserts are readily recognized and highly regarded products in the industry. Since its inception in 1938, Heli-Coil has been identified as an industry leader offering products with superior performance, reliability and integrity.

Our strict quality programs ensure that we meet the latest industry standards of QS and ISO, as is evident in our track record of consistently passing audits without technical findings. Our SPC and detailed inspection programs elevate our quality levels well above our competitors.

Heli-Coil wire inserts are manufactured with over 60 years of experience. We are dedicated to exceeding our customer's expectations by providing innovative value-added design and engineering services, on-time deliveries and excellent customer service support. Heli-Coil is committed to developing superior products manufactured to only the highest quality standards. We are more than just a supplier, we are a business partner.

Heli-Coil<sup>®</sup> is a registered trademark of Emhart Teknologies, Inc.



## Types of Inserts

There are two designs of Heli-Coil inserts...

**STANDARD**, which provides a smooth free-running thread; and, **SCREW-LOCK** which provides self-locking torque on the male member by a series of "chords" on one or more of the insert coils. They are available in inch series coarse and fine and metric series, coarse and fine. Inch series Screw-Lock inserts are dyed red for identification.



Standard Heli-Coil Insert



Screw-Lock Heli-Coil Insert

**Heli-Coil inserts** are precision formed screw thread coils worked into a diamond shape. The resultant surface finish is a mirror-like 8-16 micro inches. This wire is then wound into a spiral coil which when installed into Heli-Coil tapped holes, provides permanent conventional 60° internal screw threads. This assembled insert accommodates any standard bolt or screw (MIL-S-7742) and MIL-S-8879 (UNJ controlled radius root) male threaded members. (See page 8 for material availability.)

Heli-Coil inserts are larger in diameter before installation than the tapped hole. During installation the inserting tool applies torque to the tang reducing the diameter of the leading coil permitting it to enter the tapped thread. After installation each high tensile stainless steel coil of the insert expands outward with a spring-like action permanently anchoring the insert.

## Size Range:

- UNC #2 through 1-1/2
- UNF #2 through 1-1/2
- Metric Coarse M2 through M39
- Metric Fine M8 through M39

Inserts are also available in UNEF, UNS, 8UN, 12UN, 16UN, Spark Plug and Pipe Thread.

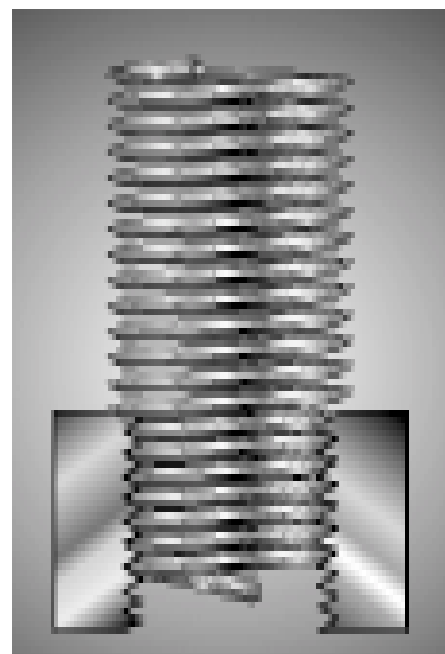


Illustration of the Retention Principle



## FEATURES & BENEFITS...

### Heli-Coil inserts provide

a positive means for protecting and strengthening tapped threads in any material. The unique design features of the insert offer many benefits...

- **Stronger Assemblies.**

Tapped threads are strengthened because the inherent flexibility of the insert provides a more balanced distribution of dynamic and static loads throughout the length of thread engagement. This flexibility also compensates for variation in lead and angle error allowing each coil to carry its share of the load.

- **No Thread Wear.**

Thread life is dramatically increased even after repeated assembly and disassembly, because the insert hardness and surface finish practically eliminate erosion of the thread form due to friction.

- **Corrosion Resistance.**

Under normal environmental conditions, Heli-Coil inserts minimize galvanic action within the threaded assembly because of their superior corrosion resistance.

- **Design Flexibility.**

Bolt tensile strength can be balanced against parent material shear strength, assuring bolt failure rather than parent material damage. Five insert lengths are available in each thread size.

- **Eliminate Stress.**

Virtually no stress is introduced into the parent material because there is no staking,

locking, swaging or keying in place — the outward spring-like action of the insert holds it in place.

- **Minimize Space & Weight**

Heli-Coil inserts allow use of smaller bosses, flanges and fasteners than any other insert. Heli-Coil inserts can generally be incorporated in existing designs, where no provision has been made for an insert, without increasing boss size.

- **Minimize Total Cost.**

Cost savings abound. Lower insert cost, lower installation cost, and Heli-Coil inserts provide design flexibility by allowing a wide choice of parent materials while maintaining maximum threaded assembly strength.

- **True Clamping Torque.**

Maximum clamping action and bolt tension are assured with minimum wrench torque, because of the mirror-smooth surface finish of Heli-Coil inserts.

- **Wide Temperature Range.**

Heli-Coil stainless steel inserts can be used in temperatures ranging from  $-320^{\circ}\text{F}$  to  $+800^{\circ}\text{F}$ .

- **Quality & Reliability.**

Stringent Quality Assurance and Engineering Standards are rigidly enforced in all phases of the manufacturing process. This assures integrity of your product design.

### High Production

Heli-Coil inserts are available mounted on plastic strips and wound onto reels (500 or 1000 inserts per reel). With power installation tooling, use of strip feed inserts will substantially increase installation rates by minimizing handling.

### Universal Acceptance

Heli-Coil Standard and Screw-lock Inserts are the original — and have an extensive background of tension, torque, shear, vibration and fatigue tests conducted by American industry's leading companies as well as the U.S. Military. Successful applications in the fields of aviation, electronics, industrial, automotive and military equipment provide a wealth of experience and confidence in the performance and reliability of Heli-Coil inserts.

### Total Design Service

In addition to the benefits listed above, Heli-Coil provides a wide range of support to solve fastening problems. This manual is one of them — the following pages are presented in a manner to make it easy to "design-in" Heli-Coil inserts to take advantage of the extraordinary benefits they provide.

Additionally, our Sales Engineers, Applications Engineers and Design Engineers are available for consultation of specific designs. When the product gets to the manufacturing phase, our extensive experience in production tooling and installation techniques ensures that you can indeed make your product better with Heli-Coil inserts.

## LOCKING FEATURES & BENEFITS...

Heli-Coil offers three types of locking inserts for multiple applications...

### Screw-Lock Inserts:

- Positive self-locking torque, complying with NASM 8846, MA1565 and MIL-N-25027.
- A resilient locking mechanism (applies to Heli-Coil screw-lock inserts) that grips the bolt and prevents it from loosening under vibration or impact.
- Repeated assembly and disassembly without appreciable loss of self-locking torque.
- Savings in space, weight and money, through the elimination of lock wiring, lock nuts, lock washers, chemical compounds, plastic pellets/patches and other locking mechanisms.

### Hi-Torque Inserts:

- Similar to Screw-Lock except higher prevailing torque compensates for reduced friction in highly lubricated applications.
- Ideal for higher vibration applications.
- Approximate 40% increase in prevailing torque levels.
- Available in #10 through 3/8" UNF only
- Meets **AS3094, 3095, 3096, 3097**

### Stud-Lock Inserts:

- Highest prevailing torque insert available.
- Enables use of threaded rod for space-saving stud applications.
- Allows for any class fit of threaded rod.
- Eliminates inconsistencies caused by interference-fit studs.
- Available for both straight and step studs, #10 through 1/2" UNC and UNF.
- Meets **AS3080, 3081, 3082, 3083**

**Locks Adjustment Screws.** This simple design allows permanent, positive adjustment of screws in any position, secure against vibration or impact.

**Inaccessible or Miniaturized Assemblies.** Heli-Coil Screw-Lock insert permits the installation of the lock from the front or top. No blind fumbling for assembly of lock washers or lock nuts behind or underneath.

**Lock Set Screws.** Positively locks assembly against loosening at desired adjustment – protects threads against stripping under high torque – permits use of light housing materials.

**The locking action** is achieved by one or more of the insert coils having a series of straight segments or “chords”. When the bolt enters the “grip” coil, these chordal segments flex outward, creating pressure on the bolt. The pressure is exerted between the flanks of the bolt thread to establish an extensive positive and consistent self-locking torque over more cycles than any other prevailing torque mechanism.

## Military Standards

Heli-Coil inserts and tooling comply with the following Standards and Specifications:

- **NASM 122076 thru NASM 122275.** Insert, corrosion resistant Helical Coil Coarse Thread (Inch Series)
- **NASM 124651 thru NASM 124850.** Insert, corrosion resistant Helical Coil Fine Thread (Inch Series)
- **NASM 21209.** Insert Screw Thread – Self Locking (Inch Series)
- **NASM 33537.** Insert – Standard Dimensions, Assembly
- **NASM 8846.** Insert, Screw Thread, Helical Coil
- **MA1565.** Insert, Screw Thread, Helical Coil (Metric Series)
- **MA1567.** Insert, Screw Thread, Helical Coil (Metric Series), Standard Dimensions, Assembly
- **MA3279, 3280, 3281.** Insert, Screw Thread, Helical Coil (Metric Series), Screw-Locking
- **A-A-59158.** Tools for inserting and extracting Helical Coil Inserts
- **FED-STD-H28.** Screw Thread Standards for Federal/Services
- **AS3094 thru 3097**
- **AS3080 thru 3083** Special Locking Torque Inserts

# Heli-Coil® insert materials

Heli-Coil inserts are available in a wide choice of materials to suit specific application needs. Contact Heli-Coil Applications Engineering to determine the correct material for your specific application.



## 304 Stainless Steel

- Standard, general purpose material
- Stocked in most sizes
- Ideal for original equipment applications, repair, and overhaul

### **Material Spec: AS7245**

Temperature range: up to 800°F  
Tensile: 200,000 – 250,000 PSI  
Hardness: RHc 43-50  
Corrosion resistance: Moderate  
Magnetic Permeability: 2-10 G/o (depending on wire size)



## Inconel X750

- Used in areas exposed to high temperatures
- Typical uses: gas turbine engines, nuclear applications, well drilling
- Non-magnetic

### **Material Spec: AS7246**

Temperature range: up to 1,000°F  
Tensile: 200,000 PSI  
Hardness: RHc 43-50  
Corrosion resistance: High  
Magnetic Permeability: <1 G/o



## Phosphor Bronze

- Ideal for salt water applications
- Non-magnetic
- Excellent electrical conductivity

Temperature range: up to 250°F  
Tensile: 140,000 PSI  
Hardness: HRB 95  
Corrosion resistance: High  
Magnetic Permeability: <1 G/o



## Nitronic 60™

- Superb gall resistance
- Compatible with stainless steel screws
- Ideal for use in vacuum environments
- Requires no additional coatings or plating
- Particle free
- Non-magnetic

### **Material Spec: UNS S21800**

Temperature range: up to 500°F  
Tensile: 200,000 PSI  
Hardness: RHc 43-50  
Corrosion resistance: Moderate  
Magnetic Permeability: <1 G/o



## Titanium

- Superior strength-to-weight ratio
- Corrosion resistant
- Excellent low temperature stability

### **Material Spec: AMS 4957 & AMS 4958A**

Temperature range: up to 600°F  
Tensile: 150,000 to 220,000 PSI  
Hardness: RHc 35-43  
Corrosion resistance: High  
Magnetic Permeability: non-magnetic

Note: Nitronic 60™ is a trademark of AK Steel

<b>Coatings/ Plating</b>	<b>Benefits</b>
<b>Dry Film Lubricant</b>	<p>Provides additional lubrication in high friction applications                      High temperature resistance (400°F)                      Highly recommended with Heli-Coil Screw-Lock inserts                      Mildly corrosion resistant</p>
	<p><b>Material Spec:</b> AS5272                      Color: Grey</p>
<b>Cadmium Plating</b>	<p>Provides high corrosion resistance                      Provides lubrication to prevent galling                      (Not recommended for new design due to its toxic nature)</p>
	<p><b>Material Spec: QQ-P-416 Type II</b>                      Color: Iridescent yellow - Free-Running                      Color: Olive drab - Screw-Lock</p>
<b>Primer- Free™</b>	<p>Prevents galvanic corrosion between insert and parent material                      Eliminates need for zinc primers                      Eliminates locking torque issues associated with primers                      Improves installation productivity                      Provides additional lubrication facilitating insert installation</p>
	<p><b>Material Spec: None</b>                      Color: Glossy black</p>
<b>Silver Plating</b>	<p>Recommended to reduce galling of threads at high temperatures                      For use up to 1200°F</p>
	<p><b>Material Spec: QQ-S-365</b>                      Color: Silver white</p>
<b>Color Coding</b>	<p>Facilitates verification of insert installation                      Allows for quick identification of similar size inserts                      Available in blue, green, red, and black*</p>

\* All Heli-Coil Inch Screw-Lock inserts are supplied with a red coloring in accordance with NASM 21209



# Heli-Coil screw lock torque data

Heli-Coil Screw-Lock inserts meet the locking torque value of Tables I and II shown below. The values shown conform to NASM 8846 (inch series) or MA1565 (metric series) requirement.

**IMPORTANT NOTE:** When using heat-treated steel screws or stainless steel screws with a Screw-Lock insert, an anti-seize compound **MUST** be applied to the screw or insert to minimize galling and maximize cycle life. To improve the wear life of the screws in Screw-Lock insert applications, specify Dry Film Lubricant (Molybdenum Disulfide), cadmium plating or Primer Free coating be applied to the insert.

**TABLE I. Heli-Coil Insert Locking Torque – Inch**

Thread Size	Max. Locking Torque	Min. Locking Torque 15 <sup>th</sup> Cycle
<b>INCH COARSE</b>		
1 (.073)-64	15 oz-in	2 oz-in
2 (.086)-56	20 oz-in	3 oz-in
3 (.099)-48	32 oz-in	7 oz-in
4 (.112)-40	48 oz-in	10 oz-in
5 (.125)-40	75 oz-in	13 oz-in
6 (.138)-32	6 lb-in	1.0 lb-in
8 (.164)-32	9 lb-in	1.5 lb-in
10 (.190)-24	13 lb-in	2.0 lb-in
12 (.216)-24*	24 lb-in	3.0 lb-in
1/4 (.2500)-20	30 lb-in	4.5 lb-in
5/16 (.3125)-18	60 lb-in	7.5 lb-in
3/8 (.3750)-16	80 lb-in	12.0 lb-in
7/16 (.4375)-14	100 lb-in	16.5 lb-in
1/2 (.5000)-13	150 lb-in	24.0 lb-in
9/16 (.5625)-12	200 lb-in	30.0 lb-in
5/8 (.6250)-11	300 lb-in	40.0 lb-in
3/4 (.7500)-10	400 lb-in	60.0 lb-in
7/8 (.8750)-9	600 lb-in	82.0 lb-in
1 (1.000)-8	800 lb-in	110.0 lb-in
1-1/8 (1.1250)-7	900 lb-in	137.0 lb-in
1-1/4 (1.2500)-7	1000 lb-in	165.0 lb-in
1-3/8 (1.3750)-6	1150 lb-in	185.0 lb-in
1-1/2 (1.5000)-6	1350 lb-in	210.0 lb-in
<b>INCH FINE</b>		
2 (.086)-64	20 oz-in	3 oz-in
3 (.099)-56	32 oz-in	7 oz-in
4 (.112)-48	48 oz-in	10 oz-in
6 (.138)-40	6 lb-in	1.0 lb-in
8 (.164)-36	9 lb-in	1.5 lb-in
10 (.190)-32	13 lb-in	2.0 lb-in
1/4 (.2500)-28	30 lb-in	3.5 lb-in
5/16 (.3125)-24	60 lb-in	6.5 lb-in
3/8 (.3750)-24	80 lb-in	9.5 lb-in
7/16 (.4375)-20	100 lb-in	14.0 lb-in
1/2 (.5000)-20	150 lb-in	18.0 lb-in
9/16 (.5625)-18	200 lb-in	24.0 lb-in
5/8 (.6250)-18	300 lb-in	32.0 lb-in
3/4 (.7500)-16	400 lb-in	50.0 lb-in
7/8 (.8750)-14	600 lb-in	70.0 lb-in
1 (1.000)-14*	800 lb-in	92.0 lb-in
1 (1.000)-12	800 lb-in	90.0 lb-in
1-1/8 (1.1250)-12	900 lb-in	117.0 lb-in
1-1/4 (1.2500)-12	1000 lb-in	143.0 lb-in
1-3/8 (1.3750)-12	1150 lb-in	165.0 lb-in
1-1/2 (1.5000)-12	1350 lb-in	190.0 lb-in

**TABLE II. Heli-Coil Insert Locking Torque – Metric**

Thread Size	Max. Locking Torque N.m	Min. Locking Torque 15 <sup>th</sup> Cycle N.m
<b>METRIC COARSE</b>		
M2x0.4	0.12	0.003
M2.2x0.45	0.14	0.02
M2.5x0.45	0.23	0.05
M3x0.5	0.45	0.1
M3.5x0.6	0.68	0.12
M4x0.7	0.9	0.15
M5x0.8	1.6	0.3
M6x1	3	0.4
M7x1	4.5	0.6
M8x1.25	6	0.8
M10x1.5	10.5	1.4
M12x1.75	15.5	2.1
M14x2	23.5	3
M16x2	31.5	4.2
M18x2.5	42	5.5
M20x2.5	54	7
M22x2.5	67.5	9
M24x3	80	10.5
M27x3	94	12
M30x3.5	108	14
M33x3.5	122	15.5
M36x4	136	17.5
M39x4	150	19.5
<b>METRIC FINE</b>		
M8x1	6	0.8
M10x1	10.5	1.4
M10x1.25	10.5	1.4
M12x1.25	15.5	2.1
M12x1.5	15.5	2.1
M14x1.5	23.5	3
M16x1.5	31.5	4.2
M18x1.5	42	5.5
M20x1.5	54	7
M22x1.5	67.5	9
M18x2	42	5.5
M20x2	54	7
M22x2	67.5	9
M24x2	80	10.5
M27x2	94	12
M30x2	108	14
M33x2	122	15.5
M36x2	136	17.5
M39x2	150	19.5
M36x3	136	17.5
M39x3	150	19.5

\* These sizes are not included in NASM 8846. Torque values shown are interpolated from sizes that are included. All torque data derived for stainless inserts only.



## Assembly Strength

Heli-Coil offers maximum design flexibility while adhering to conservative engineering practice allowing use of Heli-Coil inserts in virtually any application or material. Five lengths of inserts are available. In this design manual the lengths are listed as multiples of the nominal thread diameter of the screw; 1, 1-1/2, 2, 2-1/2, and 3. This choice of insert

length balances the bolt tensile strength against the shear strength of the parent material. This allows for the design of assemblies where the bolt will fail before the parent material. Tables III and IV below show the length of insert to be used with different combinations of bolts and parent materials.

### Guidelines for use of table:

1. When the parent material shear strength falls between two listed values, use the lower of the two values.
2. Parent material shear strengths are for room temperature. For applications at elevated temperatures, the shear strength of the material at that temperature must be determined for proper selection of bolt and insert length.
3. Be sure that the engaged thread length of the bolt is at least as long as the full tapped thread depth for the size selected (Dimension "H", Tables VII & VIII, pages 18 & 19).

Shear strength of parent material (PSI) (Alum., Mag., Steel)	Table III – Inch Bolt & Heli-Coil Insert Selection Guide								
	Bolt Material Minimum Ultimate Tensile Strength (PSI)								
	54,000	75,000	96,000	108,000	125,000	132,000	160,000	180,000	220,000
10,000	2	2-1/2	3	3	–	–	–	–	–
15,000	1-1/2	1-1/2	2	2-1/2	2-1/2	3	3	–	–
20,000	1	1-1/2	1-1/2	2	2	2	2-1/2	3	3
25,000	1	1	1-1/2	1-1/2	1-1/2	2	2	2-1/2	2-1/2
30,000	1	1	1	1-1/2	1-1/2	1-1/2	2	2	2-1/2
40,000	1	1	1	1	1	1-1/2	1-1/2	1-1/2	2
50,000	1	1	1	1	1	1	1	1-1/2	1-1/2

Shear strength of parent material MPa (megapascals) (Alum., Mag., Steel)	Table IV – Metric Bolt & Heli-Coil Insert Selection Guide							
	Bolt Material Minimum Ultimate Tensile Strength MPa (megapascals)							
	300	400	500	600	800	1000	1200	1400
70	1.5	2	2.5	2.5	–	–	–	–
100	1	1.5	1.5	2	2.5	3	–	–
150	1	1	1.5	1.5	2	2	2.5	3
200	1	1	1	1	1.5	1.5	1.5	2.5
250	1	1	1	1	1	1.5	1.5	2
300	1	1	1	1	1	1.5	1.5	1.5
350	1	1	1	1	1	1	1.5	1.5

Assembly strength is a function of shear area and the shear strength of both the bolt and parent material. For detailed charts on specific load values, Heli-Coil Technical Bulletin 68-2 (inch) or Engineering Standard PP15 (metric) covers the complete range of sizes, parent materials and bolt strengths.

## Type of Conditions & Protective Methods

Parent Material	Normal	Severe	Extremely Severe
Aluminum	None	1 & 2	1 & 2
Magnesium	1	1, & 2 or 3	1, 2 & 3

### Corrosion Protection Methods

#### Method 1 – Parent Material Protection

**ALUMINUM:** For oxide coating use Alodine, Anodize, Iridite, Hard Coat or similar. Iridite 14 or 14-2 (MIL-C-5541) is recommended for critical parts rather than anodizing (MIL-S-5002).

**MAGNESIUM:** For oxide coating use Iridite 15 or dichromate surface treatments. For HAE finishes, always plug tapped holes first.

#### Method 2 – Coat the insert with one of the following:

Cadmium per QQ-P-416, Type II, .0001" thick; or Dry Film Lubricant per AS 5272 (MIL-L 46010) (no graphite).

**Method 3 – Utilize Heli-Coil Primer-Free coated inserts or separate the parent material from the insert by using liquid zinc chromate primer, Federal Specification TT-P-1757. Apply the primer to the hole sparingly and install the insert while the primer is still wet.**

In addition to the above methods, further corrosion protection can be achieved by:

1. Using blind holes wherever possible.
2. Using a sealing, insulating or step-down (5052 Alum.) washer under the head of the bolt.
3. Using bolts that extend completely through the length of the insert.
4. In critical applications, using a non-hardening sealer or compound on the threaded assembly.

## Corrosion Protection

The effect of corrosion on threaded assemblies is dependent on many factors — environment, types of metals used, sealing mechanisms and length of service. The following recommendations apply for minimizing the effects of corrosion on Heli-Coil stainless steel insert assemblies at operating temperatures less than 800°F, using carbon steel or alloy steel bolts.

### The following definitions apply...

**Normal Service** – Natural atmosphere environment with the screw always assembled in the insert.

**Severe Service** – Mildly contaminated atmospheric conditions involving moisture, occasional exposure to salty air or sea spray and the screw may be left out of the insert for extended periods of time.

**Extremely Severe Service** – Assembly is exposed to salt water, corrosive atmosphere and/or the screw is out of the assembly frequently allowing a blind hole to trap water.

# Heli-Coil® insert specifications – inch

Nominal Thread Size	Type		Size Designation	"Q" Nominal Length					Outside Diameter		Number of Coils Nominal Length				
	Standard Insert No.	Screw-Lock Insert No.		1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.	Min.	Max.	1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.
				UNIFIED COARSE THREAD (UNC)											
1 (.073)-64	1185	3585	01CN	0.073	0.110	0.146	0.182	0.219	.095	.103	2-3/4	4-7/8	6-7/8	8-7/8	10-7/8
2 (.086)-56	1185	3585	02CN	0.086	0.129	0.172	0.215	0.258	.110	.119	3	5-1/4	7-3/8	9-5/8	11-7/8
3 (.099)-48	1185	3585	03CN	0.099	0.148	0.198	0.248	0.297	.128	.139	2-7/8	5	7-1/4	9-3/8	11-1/2
4 (.112)-40	1185	3585	04CN	0.112	0.168	0.224	0.280	0.336	.144	.159	2-3/4	4-3/4	6-3/4	8-7/8	10-7/8
5 (.125)-40	1185	3585	05CN	0.125	0.188	0.250	0.312	0.375	.158	.173	3-1/4	5-1/2	7-3/4	10	12-1/4
6 (.138)-32	1185	3585	06CN	0.138	0.207	0.276	0.345	0.414	.178	.193	2-3/4	4-3/4	6-7/8	8-7/8	10-7/8
8 (.164)-32	1185	3585	2CN	0.164	0.246	0.328	0.410	0.492	.205	.220	3-1/2	6	8-3/8	10-3/4	13-1/4
10 (.190)-24	1185	3585	3CN	0.190	0.285	0.380	0.475	0.570	.244	.259	2-7/8	5	7-1/8	9-1/4	11-3/8
12 (.216)-24	1185	3585	1CN	0.216	0.324	0.432	0.540	0.648	.270	.285	3-1/2	6	8-3/8	10-5/8	13-1/8
1/4 (.2500)-20	1185	3585	4CN	0.250	0.375	0.500	0.625	0.750	.310	.330	3-3/8	5-3/4	8	10-3/8	12-3/4
5/16 (.3125)-18	1185	3585	5CN	0.312	0.469	0.625	0.781	0.938	.380	.400	4	6-5/8	9-1/4	11-7/8	14-5/8
3/8 (.3750)-16	1185	3585	6CN	0.375	0.562	0.750	0.938	1.125	.452	.472	4-3/8	7-1/4	10	12-7/8	15-3/4
7/16 (.4375)-14	1185	3585	7CN	0.438	0.656	0.875	1.094	1.312	.526	.551	4-1/2	7-3/8	10-1/4	13-1/8	16-1/8
1/2 (.5000)-13	1185	3585	8CN	0.500	0.750	1.000	1.250	1.500	.597	.622	4-7/8	7-7/8	11	14-1/8	17-1/8
9/16 (.5625)-12	1185	3585	9CN	0.562	0.844	1.125	1.406	1.688	.669	.694	5-1/8	8-1/4	11-1/2	14-3/4	17-7/8
5/8 (.6250)-11	1185	3585	10CN	0.625	0.938	1.250	1.562	1.875	.742	.767	5-1/4	8-1/2	11-3/4	15	18-3/8
3/4 (.7500)-10	1185	3585	12CN	0.750	1.125	1.500	1.875	2.250	.881	.906	5-7/8	9-3/8	13	16-1/2	20-1/8
7/8 (.8750)-9	1185	3585	14CN	0.875	1.312	1.750	2.188	2.625	1.022	1.052	6-1/4	10	13-3/4	17-1/2	21-1/4
1 (1.000)-8	1185	3585	16CN	1.000	1.500	2.000	2.500	3.000	1.166	1.196	6-3/8	10-1/8	14	17-3/4	21-5/8
1-1/8 (1.1250)-7	1185	3585	18CN	1.125	1.688	2.250	2.812	3.375	1.315	1.355	6-1/8	9-7/8	13-5/8	17-1/2	21-1/4
1-1/4 (1.2500)-7	1185	3585	20CN	1.250	1.875	2.500	3.125	3.750	1.443	1.483	7	11-1/4	15-3/8	19-1/2	23-3/4
1-3/8 (1.3750)-6	1185	3585	22CN	1.375	2.062	2.750	3.438	4.125	1.598	1.643	6-1/2	10-1/2	14-3/8	18-3/8	22-1/4
1-1/2 (1.5000)-6	1185	3585	24CN	1.500	2.250	3.000	3.750	4.500	1.727	1.772	7-1/4	11-1/2	15-7/8	20-1/8	24-1/2
UNIFIED FINE THREAD (UNF)															
2 (.086)-64	1191	3591	02CN	0.086	0.129	0.172	0.215	0.258	.110	.119	3-1/2	5-7/8	8-3/8	10-3/4	13-1/8
3 (.099)-56	1191	3591	03CN	0.099	0.148	0.198	0.248	0.297	.131	.146	3-3/8	5-5/8	8	10-3/8	12-5/8
4 (.112)-48	1191	3591	04CN	0.112	0.168	0.224	0.280	0.336	.147	.162	3-3/8	5-5/8	7-7/8	10-1/4	12-1/2
6 (.138)-40	1191	3591	06CN	0.138	0.207	0.276	0.345	0.414	.173	.193	3-1/2	6	8-3/8	10-3/4	13-1/4
8 (.164)-36	1191	3591	2CN	0.164	0.246	0.328	0.410	0.492	.204	.224	3-7/8	6-1/2	9-1/8	11-5/8	14-1/4
10 (.190)-32	1191	3591	3CN	0.190	0.285	0.380	0.475	0.570	.236	.256	4-1/8	6-7/8	9-1/2	12-1/4	14-7/8
1/4 (.2500)-28	1191	3591	4CN	0.250	0.375	0.500	0.625	0.750	.306	.326	5	8-1/4	11-3/8	14-1/2	17-5/8
5/16 (.3125)-24	1191	3591	5CN	0.312	0.469	0.625	0.781	0.938	.380	.400	5-1/2	8-7/8	12-1/4	15-5/8	19
3/8 (.3750)-24	1191	3591	6CN	0.375	0.562	0.750	0.938	1.125	.448	.468	6-7/8	11	15	19-1/8	23-1/8
7/16 (.4375)-20	1191	3591	7CN	0.438	0.656	0.875	1.094	1.312	.524	.549	6-5/8	10-5/8	14-5/8	18-1/2	22-1/2
1/2 (.5000)-20	1191	3591	8CN	0.500	0.750	1.000	1.250	1.500	.592	.617	7-7/8	12-3/8	16-7/8	21-3/8	25-7/8
9/16 (.5625)-18	1191	3591	9CN	0.562	0.844	1.125	1.406	1.688	.666	.691	8	12-1/2	17-1/8	21-3/4	26-1/4
5/8 (.6250)-18	1191	3591	10CN	0.625	0.938	1.250	1.562	1.875	.733	.758	9	14-1/8	19-1/4	24-1/4	29-3/8
3/4 (.7500)-16	1191	3591	12CN	0.750	1.125	1.500	1.875	2.250	.876	.901	9-3/4	15-1/8	20-5/8	26	31-1/2
7/8 (.8750)-14	1191	3591	14CN	0.875	1.312	1.750	2.188	2.625	1.021	1.051	9-7/8	15-1/2	21-1/8	26-5/8	32-1/4
1 (1.000)-14*	1191	3591	16CN	1.000	1.500	2.000	2.500	3.000	1.156	1.186	11-1/2	17-7/8	24-1/4	30-5/8	37
1 (1.000)-12	1191	3591	161CN	1.000	1.500	2.000	2.500	3.000	1.169	1.199	9-5/8	15	20-1/2	26	31-1/2
1-1/8 (1.1250)-12	1191	3591	18CN	1.125	1.688	2.250	2.812	3.375	1.304	1.334	11-1/8	17-1/4	23-3/8	29-1/2	35-3/4
1-1/4 (1.2500)-12	1191	3591	20CN	1.250	1.875	2.500	3.125	3.750	1.439	1.469	12-1/2	19-3/8	26-1/4	33	39-7/8
1-3/8 (1.3750)-12	1191	3591	22CN	1.375	2.062	2.750	3.438	4.125	1.575	1.610	13-3/4	21-3/8	28-7/8	36-1/2	44
1-1/2 (1.5000)-12	1191	3591	24CN	1.500	2.250	3.000	3.750	4.500	1.710	1.745	15-1/4	23-1/2	31-5/8	39-7/8	48-1/8

\*Inactive for new design per NASM.

**1185-4CNY375S** Complete Part No. Example: Free Running Insert; 1/4-20; Stainless Steel; Cadmium; 1-1/2 dia.; On Strip

Type	Size	Material	Finish	Length	Packaging
1185 Free Running, Coarse	See Chart	CN – Stainless Steel	Blank – None	See Chart	Blank – Bulk
1191 Free Running, Fine		BN – Phosphor Bronze	Y – Cadmium		S – Strip Feed
3585 Screw-Lock, Coarse		TN – Inconel X	V – Silver		
3591 Screw-Lock, Fine		EN – Nitronic 60	W – Dry Film Lubricant		
		GN – Titanium	PF – Primer Free II		

**Notes on Insert Specifications:**

- Nominal Length is a computed value and cannot be measured. It is the actual assembled length + 1/2 pitch.
- The number of coils are counted 90° from the tang.
- Grip Coil(s) Location for 1, 1-1/2 and 2 diameter long inserts, Grip Coil Location = 1/2 the number of free coils. For 2-1/2 and 3 diameter long inserts, Grip Coil Location (distance from the tang) is the same as 2 diameter long inserts.

# Heli-Coil® insert specifications – metric

Nominal Thread Size	Type		Size Designation	"Q" Nominal Length					Outside Diameter		Number of Coils Nominal Length				
	Standard Insert No.	Screw-Lock Insert No.		1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.	Min.	Max.	1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.
				METRIC COARSE											
M2x0.4	1084	4184*	2CN	2.0	3.0	4.0	5.0	6.0	2.50	2.70	3-1/2	5-1/2	7-3/4	10-1/8	12-3/8
M2.2x0.45	1084	4184	2.2CN	2.2	3.3	4.4	5.5	6.6	2.80	3.00	3-1/8	5-3/8	7-5/8	9-7/8	12-1/8
M2.5x0.45	1084	4184	2.5CN	2.5	3.8	5.0	6.3	7.5	3.20	3.70	3-3/8	5-3/4	8-1/8	10-1/2	12-3/4
M3x0.5	1084	4184	3CN	3.0	4.5	6.0	7.5	9.0	3.80	4.35	3-3/4	6-3/8	8-7/8	11-3/8	13-7/8
M3.5x0.6	1084	4184	3.5CN	3.5	5.3	7.0	8.8	10.5	4.40	4.95	3-3/4	6-3/8	8-3/4	11-3/8	13-3/4
M4x0.7	1084	4184	4CN	4.0	6.0	8.0	10.0	12.0	5.05	5.60	3-5/8	6-1/8	8-5/8	11-1/8	13-5/8
M5x0.8	1084	4184	5CN	5.0	7.5	10.0	12.5	15.0	6.25	6.80	4-1/8	6-7/8	9-5/8	12-3/8	15-1/8
M6x1	1084	4184	6CN	6.0	9.0	12.0	15.0	18.0	7.40	7.95	4	6-3/4	9-1/2	12-1/8	14-7/8
M7x1	1084	4184	7CN	7.0	10.5	14.0	17.5	21.0	8.65	9.20	4-7/8	8	11-1/8	14-1/8	17-1/4
M8x1.25	1084	4184	8CN	8.0	12.0	16.0	20.0	24.0	9.80	10.35	4-1/2	7-3/8	10-1/4	13-1/4	16-1/8
M10x1.5	1084	4184	10CN	10.0	15.0	20.0	25.0	30.0	11.95	12.50	4-7/8	8	11-1/8	14-1/4	17-3/8
M12x1.75	1084	4184	12CN	12.0	18.0	24.0	30.0	36.0	14.30	15.00	5	8-1/4	11-1/2	14-5/8	17-7/8
M14x2	1084	4184	14CN	14.0	21.0	28.0	35.0	42.0	16.65	17.35	5-1/8	8-1/2	11-3/4	15	18-3/8
M16x2	1084	4184	16CN	16.0	24.0	32.0	40.0	48.0	18.90	19.60	6-1/8	9-3/4	13-1/2	17-1/4	21
M18x2.5	1084	4184	18CN	18.0	27.0	36.0	45.0	54.0	21.30	22.0	5-3/8	8-7/8	12-1/4	15-5/8	19
M20x2.5	1084	4184	20CN	20.0	30.0	40.0	50.0	60.0	23.55	24.40	6-1/8	9-7/8	13-5/8	17-3/8	21-1/8
M22x2.5	1084	4184	22CN	22.0	33.0	44.0	55.0	66.0	25.90	26.90	6-3/4	10-7/8	14-7/8	19	23-1/8
M24x3	1084	4184	24CN	24.0	36.0	48.0	60.0	72.0	28.00	29.00	6-1/8	10	13-3/4	17-1/2	21-3/8
M27x3	1084	4184	27CN	27.0	40.5	54.0	67.5	81.0	31.40	32.40	7	11-1/4	15-1/2	19-3/4	24
M30x3.5	1084	4184	30CN	30.0	45.0	60.0	75.0	90.0	34.80	36.00	6-3/4	10-3/4	14-7/8	18-7/8	23
M33x3.5	1084	4184	33CN	33.0	49.5	66.0	82.5	99.0	37.80	39.20	7-1/2	12	16-1/2	21	25-3/8
M36x4	1084	4184	36CN	36.0	54.0	72.0	90.0	108.0	41.50	42.90	7-1/8	11-3/8	15-5/8	19-7/8	24-1/4
M39x4	1084	4184	39CN	39.0	58.5	78.0	97.5	117.0	44.60	46.00	7-7/8	12-1/2	17-1/8	21-3/4	26-3/8
METRIC FINE															
M8x1	4255	5255	8CN	8.0	12.0	16.0	20.0	24.0	9.70	10.25	5-7/8	9-3/8	13	16-1/2	20-1/8
M10x1	4255	5255	10CN	10.0	15.0	20.0	25.0	30.0	11.95	12.50	7-5/8	12	16-1/2	21	25-1/2
M10x1.25	4649	5649	10CN	10.0	15.0	20.0	25.0	30.0	12.10	12.65	5-7/8	9-1/2	13-1/8	16-3/4	20-3/8
M12x1.25	4649	5649	12CN	12.0	18.0	24.0	30.0	36.0	14.30	15.00	7-1/4	11-5/8	15-7/8	20-1/4	24-1/2
M12x1.5	3745	5145	12CN	12.0	18.0	24.0	30.0	36.0	14.25	14.95	6	9-5/8	13-3/8	17	20-3/4
M14x1.5	3745	5145	14CN	14.0	21.0	28.0	35.0	42.0	16.55	17.25	7-1/8	11-3/8	15-5/8	20	24-1/4
M16x1.5	3745	5145	16CN	16.0	24.0	32.0	40.0	48.0	18.90	19.60	8-1/4	13-1/8	18	22-3/4	27-5/8
M18x1.5	3745	5145	18CN	18.0	27.0	36.0	45.0	54.0	21.05	21.75	9-1/2	15	20-3/8	25-7/8	31-3/8
M20x1.5	3745	5145	20CN	20.0	30.0	40.0	50.0	60.0	23.15	24.00	10-3/4	16-7/8	22-7/8	28-7/8	35
M22x1.5	3745	5145	22CN	22.0	33.0	44.0	55.0	66.0	25.55	26.45	11-7/8	18-1/2	25-1/8	31-5/8	38-1/4
M18x2	4266	5266	18CN	18.0	27.0	36.0	45.0	54.0	21.15	21.85	7	11-1/8	15-3/8	19-1/2	23-5/8
M20x2	4266	5266	20CN	20.0	30.0	40.0	50.0	60.0	23.20	24.05	7-7/8	12-1/2	17-1/4	21-7/8	26-1/2
M22x2	4266	5266	22CN	22.0	33.0	44.0	55.0	66.0	25.60	26.50	8-3/4	13-3/4	18-7/8	23-7/8	29
M24x2	4266	5266	24CN	24.0	36.0	48.0	60.0	72.0	28.10	29.10	9-1/2	15	20-3/8	25-7/8	31-1/4
M27x2	4266	5266	27CN	27.0	40.5	54.0	67.5	81.0	31.30	32.30	10-7/8	17	23-1/4	29-3/8	35-1/2
M30x2	4266	5266	30CN	30.0	45.0	60.0	75.0	90.0	34.50	35.70	12-1/4	19-1/8	25-7/8	32-3/4	39-1/2
M33x2	4266	5266	33CN	33.0	49.5	66.0	82.5	99.0	37.80	39.20	13-5/8	21-1/8	28-5/8	36	43-1/2
M36x2	4266	5266	36CN	36.0	54.0	72.0	90.0	108.0	41.00	42.40	15	23-1/4	31-3/8	39-1/2	47-3/4
M39x2	4266	5266	39CN	39.0	58.5	78.0	97.5	117.0	44.30	45.70	16-3/8	25-1/4	34-1/8	43	51-7/8
M36x3	4277	5277	36CN	36.0	54.0	72.0	90.0	108.0	41.30	42.70	9-3/4	15-1/4	20-7/8	26-1/2	32
M39x3	4277	5277	39CN	39.0	58.5	78.0	97.5	117.0	44.40	45.80	10-3/4	16-3/4	22-3/4	28-7/8	34-7/8

\*M2 not available in Screen-Lock 1 diameter length

**1084-4CNY060S** Complete Part No. Example: Free Running Insert; M4 x 0.7  
Stainless Steel; Cadmium; 1 dia.; On Strip

Type	Size	Material	Finish	Length	Packaging
1084 Free Running, Coarse	See Chart	CN – Stainless Steel	Blank – None	See Chart	Blank – Bulk
4255, 4649, 3745, 4266 & 4277 Free Running, Fine		BN – Phosphor Bronze	Y – Cadmium		S – Strip Feed
4184 Screw-Lock, Coarse		TN – Inconel X	V – Silver		
5255, 5649, 5145, 5266 & 5277 Screw-Lock, Fine		EN – Nitronic 60	W – Dry Film Lubricant		
		GN – Titanium	PF – Primer Free II		

### Notes on Insert Specifications:

- Nominal length is a computed value and cannot be measured. It is the actual assembled length + 1/2 pitch.
- The number of coils are counted from the notch.
- Phosphor Bronze Inserts – **Not available** in sizes M2, M2.2, M2.5, M3, M3.5 and M4.
- Inconel X Inserts – 1 diameter long Screw-Lock inserts **not available** in sizes M2, M2.2, M2.5 and M3.

# Heli-Coil® Tangless® Inserts

Heli-Coil Tangless® Inserts eliminate tang break-off and retrieval and are easily adjusted or removed after installation.

• **STRONGER ASSEMBLIES**

Tapped threads are strengthened because the inherent flexibility of the insert provides a more balanced distribution of static and dynamic loads throughout the engagement length.

- **BI-DIRECTIONAL DESIGN**  
Installs quickly and easily from either end.
- **ELIMINATE STRESS.** Virtually no stress is induced into the parent material as no staking, swaging or keying in place is required.

- **POSITIVE SELF-LOCKING TORQUE.** Heli-Coil Tangless® screw-lock inserts provide a positive, self-locking torque complying with the requirements of NASM8846.
- **MINIMIZE SPACE AND WEIGHT.** Requires smaller boss than solid inserts; minimize total in-place cost.
- **CONFORM TO NAS1130**

## Selecting a Heli-Coil Tangless® Insert

Heli-Coil Tangless® inserts are made from 304 Stainless Steel per AS7245 (see chart below for thread size designation), and are available in three lengths:

1, 1-1/2 and 2 diameters.

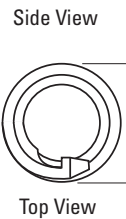
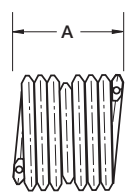
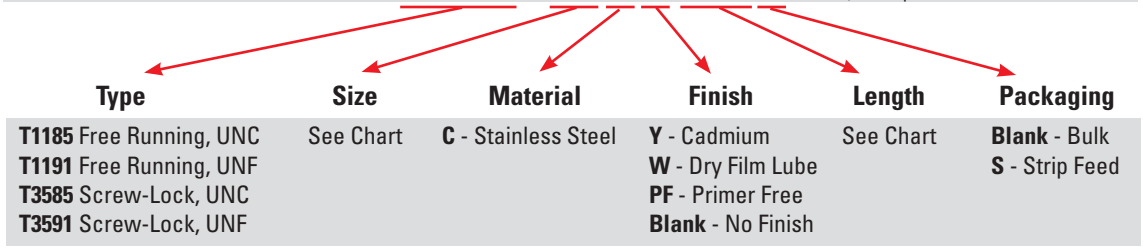
Tangless® inserts can be ordered with a Cadmium Plate finish (Y), Dry Film Lube finish (W), Primer Free II finish (PF) or no finish (Blank).

Below is an example of how to order Heli-Coil Tangless inserts.



### T3585-04CW112S

Complete Part No. Example: Screw-locking Insert; #4-40; Stainless Steel; Dry Film Lube, 1 dia., On Strip



Nominal Thread Size	Type		Size Designation	"A" Normal Length			"B" Free Outer Dia.		Number of Coils Nominal Length		
	Free Running	Screw-Lock		1 Dia.	1 1/2 Dia.	2 Dia.	Min.	Max.	1 Dia.	1 1/2 Dia.	2 Dia.
<b>Unified Coarse Thread (UNC)</b>											
2 (.086)-56	T1185	T3585	02C	.086	.129	.172	.110	.119	3	5-1/4	7-3/8
4 (.112)-40	T1185	T3585	04C	.112	.168	.224	.144	.159	2-3/4	4-3/4	6-3/4
6 (.138)-32	T1185	T3585	06C	.138	.207	.276	.178	.193	2-3/4	4-3/4	6-7/8
8 (.164)-32	T1185	T3585	2C	.164	.246	.328	.205	.220	3-1/2	6	8-3/8
10 (.190)-24	T1185	T3585	3C	.190	.285	.380	.244	.259	2-7/8	5	7-1/8
1/4 (.250)-20	T1185	T3585	4C	.250	.375	.500	.310	.330	3-3/8	5-3/4	8
<b>Unified Fine Thread (UNF)</b>											
10(.190)-32	T1191	T3591	3C	.190	.285	.380	.236	.256	4-1/8	6-7/8	9-1/2
1/4(.250)-28	T1191	T3591	4C	.250	.375	.500	.326	.306	5	8-1/4	11-3/8



# Heli-Coil assembly design

## Boss Dimensions

Standard boss configurations may be used with Heli-Coil inserts.

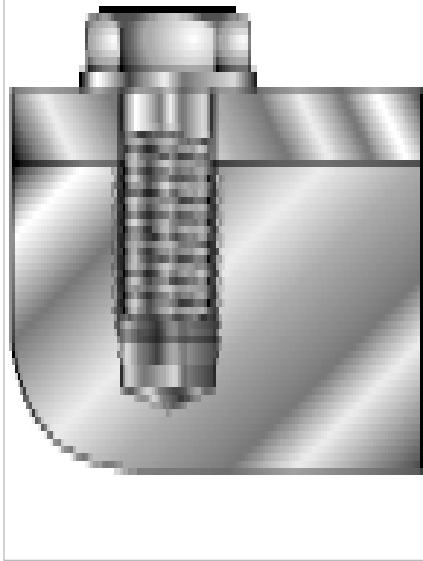
A boss diameter of twice the nominal bolt size is adequate for most load conditions. For critical applications, the boss diameter should be twice the Heli-Coil tap major diameter (Tables VII & VIII, Pages 18 & 19). Boss thickness is a function of the size and length of the insert chosen and the particular requirements of the component being designed. The use of Heli-Coil inserts generally minimizes the size of the boss because their high strength characteristics allow for smaller or fewer fasteners.

## Class of Fit

Since Heli-Coil inserts are flexible, the class of fit of the final assembly is a function of the tapped hole. Heli-Coil STI (Screw Thread Insert) taps are available in inch series for both Class 2B and 3B. Metric Classes include 5H and 4H5H. Class 2B tapped holes provide maximum production tolerances while Class 3B or 4H5H holes provide slightly higher and more consistent self-locking torque when Screw-Lock inserts are used.

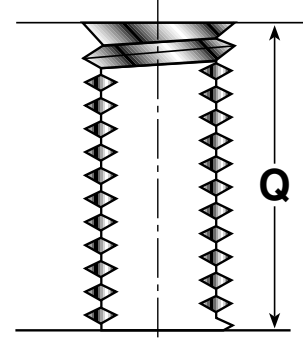
## Bolt Projection

The bolt must engage the entire insert to insure maximum strength of a Heli-Coil insert assembly. It is strongly recommended that the tang always be removed and bolt projection be equal to the full tapped thread depth (Dimension H, Tables VII & VIII, Pages 18 & 19). If design limitations prohibit this, contact us to obtain minimum bolt projection data.



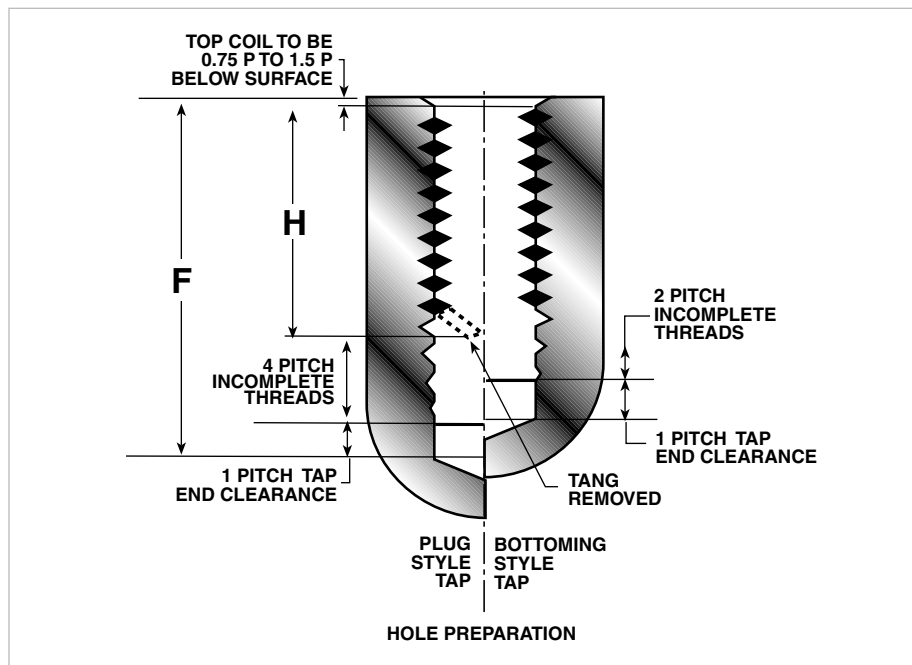
## Material Thickness

The minimum material thickness for through hole assemblies is equal to the Insert Nominal Length (Dimension Q, Pages 12 & 13), without a countersink and the insert installed 1/4-1/2 pitch below the surface. For production, the hole should be countersunk, and the insert installed 3/4-1-1/2 pitch below the surface. In this case the minimum material thickness is "Q" + 1 pitch.



## Drawing Call Out

Below is a typical drawing call out for a Heli-Coil Insert Assembly. The example used is a 3/8-24 x .562 long Screw-Lock insert in a blind hole, Class 3B fit, tapped with a plug tap.



## Engineering Data

Conventional machining methods are used for Heli-Coil assemblies. The process is simple...

1. Drill
2. Countersink
3. Tap
4. Gage

### 1. Drilling

The suggested drill sizes listed for aluminum in Tables V & VI, pages 16 & 17, are within the minor diameter limits specified in NASM33537 or MA1565. Drill sizes listed for steel, magnesium and plastic are larger (in most cases) allowing for parent material "close-in" in soft materials and increased tap wear life in hard materials.

The drill depths listed in this table allow for tap end clearance, maximum insert "set-down", countersink, and the chamfer on the tap. These drill depths are minimum and should be increased where possible, especially when using Spiral Pointed Taps, to allow for chip clearance. The formula for the drill depth is given on Pages 16 & 17.

### Preparing Process Sheets

*A sample process sheet for preparing a tapped hole for Heli-Coil inserts is shown below. Highlighted are references to the various dimensional data and part number specifications listed in the tables on pages listed. Insert installation and tang break off are covered in subsequent pages.*

### 2. Countersinking

Countersinking the drilled hole is recommended to prevent a feather edge at the top of the tapped hole and to help guide the insert into the tapped threads. A 120° included angle countersink is necessary to insure that the angle of the tapped thread and the countersink are the same ( $120^\circ \div 2 = 60^\circ$  tapped thread).

### 3. Tapping

The dimensions for the depth of the full tapped thread (Dimension H, Tables VII & VIII, Pages 18 & 19) are **MINIMUM** for blind holes with countersinks. For through holes **without** a countersink the minimum full tapped thread depth must be equal to the insert nominal length (Dimension Q, Pages 12 & 13).

Heli-Coil taps for free machining materials are listed in Tables IX & XII, Pages 20 & 22 Class 2B (inch), 5H metric and 3B (inch) or 4H5H (metric) tapped holes. (Class of fit recommendations are given on Page 14). There are four types of taps listed:

- Straight, Flute, Plug & Bottoming style which are used for

hand and short run production

- **Spiral Point Plug** taps (chips are pushed forward) are used for through holes and blind hole with ample chip clearance at the bottom.
- **High Spiral Flute Bottoming** taps (chips are pulled out of the hole) are used for deep or blind holes in soft stringy materials and holes with minimal chip clearance
- **Roughing** taps (7/16-1") are available for materials difficult to tap to reduce the load and wear on the finishing tap.

If it is necessary to decrease the *Minimum Depth* of the drilled and tapped hole, one or more of the following steps may be helpful:

Action	Amount of Reduction
Remove the male center on plug taps 5/16, M8 & under	one half of the bolt diameter
Use a bottoming tap	2 pitches
Eliminate the countersink	1/2 pitch
Reduce insert "set-down" to 1/4-1/2 pitch	up to 1/2 pitch

### 4. Gaging

Heli-Coil thread plug gages should be used to check, according to sampling plan, the tapped holes before insert installation. See Pages 24 & 25 for gage part numbers and further gaging data.

#### Hole preparation for 3/8-24, Screw-Lock Heli-Coil Insert, .562 long, Part No. 3591-6CN562 Blind Hole, Class 3B, tapped with a plug tap in aluminum

Oper. No.	Operation Description	Tool or Gage
10	Drill hole .3840/.3910 diameter to minimum depth (Dimension F, Tables V & VI, Pages 16 & 17)	25/64 drill (.3906), Tables V & VI, Pages 16 & 17
20	Countersink 120°±5° to .42/.45 diameter (Dimension M, Tables VII & VIII, Pages 18 & 19)	120° countersink
30	Tap 3/8 (.3750)-24 UNF-3B STI Thread Depth .600 (Dimension H, Tables VII & VIII, Pages 18 & 19)	Heli-Coil tap 6FPB, Tables IX & XI, Pages 20 & 22
40	Remove chips	Air Nozzle
50	Gage according to your sampling plan	Heli-Coil gage 3694-6, Pages 24 & 25
60	Install 3591-6CN562 Heli-Coil insert 3/4 to 1-1/2 pitch below surface	Installation Tool 7552-6, Page 27
70	Break off tang	Heli-Coil tang break-off tool 3692-6, Page 31

# Heli-Coil drilling data – inch

The **minimum** drilling depths shown below allow for the following recommended practices:

1. Countersinking the drilled hole to prevent a feather edge at the start of the tapped hole.

2. 3/4 – 1-1/2 pitch of insert “set-down” to allow for maximum production tolerance.

Dimensions are shown for both plug and bottoming taps.

(Note: Plug taps 5/16" or M8 and smaller have a male center and the drilled hole depth dimensions allow for this length (one half of the diameter of the bolt). Calculation of dimension “F” is as follows:

**TABLE V – INCH DRILLED HOLE DIMENSIONS**

Nominal Thread Size	Suggested Drill Size		“F” MINIMUM DRILLING DEPTH FOR EACH INSERT LENGTH									
			Plug Taps					Bottoming Taps				
	Aluminum	Steel, Magnesium, Plastic	1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.	1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.
<b>UNIFIED COARSE</b>												
1 (.073)-64	#47 (.0785)	#46 (.0810)	.203	.240	.276	.313	.349	.136	.172	.209	.245	.282
2 (.086)-56	3/32 (.0938)	#41 (.0960)	.236	.279	.322	.365	.408	.157	.200	.243	.286	.329
3 (.099)-48	#36 (.1065)	7/64 (.1094)	.273	.323	.372	.422	.471	.182	.232	.281	.331	.380
4 (.112)-40	#31 (.1200)	#31 (.1200)	.318	.374	.430	.486	.542	.212	.268	.324	.380	.436
5 (.125)-40	3.4mm (.1339)	#29 (.1360)	.338	.400	.462	.525	.588	.225	.288	.350	.412	.475
6 (.138)-32	#26 (.1470)	#25 (.1495)	.394	.464	.532	.602	.670	.263	.332	.401	.470	.539
8 (.164)-32	#17 (.1730)	#16 (.1770)	.434	.516	.598	.680	.762	.289	.371	.453	.535	.617
10 (.190)-24	13/64 (.2031)	#5 (.2055)	.535	.630	.725	.820	.915	.357	.452	.547	.642	.737
12 (.216)-24*	#1 (.2280)	#1 (.2280)	.574	.682	.790	.898	1.006	.383	.491	.599	.707	.815
1/4 (.2500)-20	H (.2660)	H (.2660)	.675	.800	.925	1.050	1.175	.450	.575	.700	.825	.950
5/16 (.3125)-18	Q (.3320)	Q (.3320)	.801	.957	1.113	1.269	1.425	.534	.690	.846	1.002	1.158
3/8 (.3750)-16	X (.3970)	X (.3970)	.750	.938	1.125	1.312	1.500	.625	.812	1.000	1.188	1.375
7/16 (.4375)-14	29/64 (.4531)	29/64 (.4531)	.867	1.086	1.305	1.524	1.743	.724	.943	1.162	1.381	1.600
1/2 (.5000)-13*	33/64 (.5156)	17/32 (.5312)	.962	1.212	1.462	1.712	1.962	.808	1.058	1.308	1.558	1.808
9/16 (.5625)-12*	37/64 (.5781)	19/32 (.5938)	1.062	1.343	1.624	1.905	2.186	.895	1.176	1.457	1.738	2.019
5/8 (.6250)-11	21/32 (.6562)	21/32 (.6562)	1.170	1.483	1.795	2.108	2.420	.989	1.301	1.614	1.926	2.239
3/4 (.7500)-10	25/32 (.7812)	25/32 (.7812)	1.350	1.725	2.100	2.475	2.850	1.150	1.525	1.900	2.275	2.650
7/8 (.8750)-9	29/32 (.9062)	29/32 (.9062)	1.542	1.979	2.417	2.854	3.292	1.319	1.757	2.194	2.632	3.069
1 (1.000)-8	1-1/32 (1.0312)	1-1/32 (1.0312)	1.750	2.250	2.750	3.250	3.750	1.500	2.000	2.500	3.000	3.500
1-1/8 (1.1250)-7	1-11/64 (1.1719)	1-11/64 (1.1719)	1.982	2.545	3.107	3.670	4.232	1.696	2.259	2.821	3.384	3.946
1-1/4 (1.2500)-7	1-19/64 (1.2969)	1-19/64 (1.2969)	2.107	2.732	3.357	3.982	4.607	1.821	2.446	3.071	3.696	4.321
1-3/8 (1.3750)-6	1-27/64 (1.4219)	1-27/64 (1.4219)	2.375	3.062	3.750	4.437	5.125	2.042	2.729	3.417	4.104	4.792
1-1/2 (1.5000)-6	1-35/64 (1.5469)	1-35/64 (1.5469)	2.500	3.250	4.000	4.750	5.500	2.167	2.917	3.667	4.417	5.167
<b>UNIFIED FINE</b>												
2 (.086)-64	2.35mm (.0925)	2.35mm (.0925)	.223	.266	.309	.352	.395	.149	.192	.235	.278	.321
3 (.099)-56	#37 (.1040)	#36 (.1065)	.256	.305	.355	.404	.454	.170	.220	.269	.319	.368
4 (.112)-48	3mm (.1181)	#31 (.1200)	.293	.349	.405	.461	.517	.195	.251	.307	.363	.419
6 (.138)-40	#26 (.1470)	#25 (.1495)	.357	.426	.495	.564	.633	.238	.307	.376	.445	.514
8 (.164)-36	#17 (.1730)	#16 (.1770)	.413	.495	.577	.659	.741	.275	.357	.439	.521	.603
10 (.190)-32	#7 (.2010)	13/64 (.2031)	.472	.568	.662	.758	.852	.315	.410	.505	.600	.695
1/4 (.2500)-28	G (.2610)	6.7mm (.2638)	.589	.714	.839	.964	1.089	.393	.518	.643	.768	.893
5/16 (.3125)-24	21/64 (.3281)	21/64 (.3281)	.718	.874	1.030	1.186	1.342	.479	.635	.791	.947	1.103
3/8 (.3750)-24	25/64 (.3906)	25/64 (.3906)	.625	.812	1.000	1.187	1.375	.542	.729	.917	1.104	1.292
7/16 (.4375)-20	29/64 (.4531)	29/64 (.4531)	.738	.957	1.176	1.395	1.614	.638	.857	1.076	1.295	1.514
1/2 (.5000)-20	33/64 (.5156)	33/64 (.5156)	.800	1.050	1.300	1.550	1.800	.700	.950	1.200	1.450	1.700
9/16 (.5625)-18	37/64 (.5781)	37/64 (.5781)	.895	1.176	1.457	1.738	2.019	.784	1.065	1.346	1.627	1.908
5/8 (.6250)-18	41/64 (.6406)	41/64 (.6406)	.958	1.271	1.583	1.896	2.208	.847	1.160	1.472	1.785	2.097
3/4 (.7500)-16	49/64 (.7656)	49/64 (.7656)	1.125	1.500	1.875	2.250	2.625	1.000	1.375	1.750	2.125	2.500
7/8 (.8750)-14	57/64 (.8906)	57/64 (.8906)	1.304	1.741	2.179	2.616	3.054	1.161	1.598	2.036	2.473	2.911
1 (1.000)-14	1-1/64 (1.0156)	1-1/32 (1.0312)	1.429	1.929	2.429	2.929	3.429	1.286	1.786	2.286	2.786	3.286
1 (1.000)-12*	1-1/64 (1.0156)	1-1/32 (1.0312)	1.500	2.000	2.500	3.000	3.500	1.333	1.833	2.333	2.833	3.333
1-1/8 (1.1250)-12*	1-9/64 (1.1406)	1-5/32 (1.1562)	1.625	2.187	2.750	3.312	3.875	1.458	2.021	2.583	3.146	3.708
1-1/4 (1.2500)-12*	1-17/64 (1.2656)	1-9/32 (1.2812)	1.750	2.375	3.000	3.625	4.250	1.583	2.208	2.833	3.458	4.083
1-3/8 (1.3750)-12*	1-25/64 (1.3906)	1-13/32 (1.4062)	1.875	2.562	3.250	3.937	4.625	1.708	2.396	3.083	3.771	4.458
1-1/2 (1.5000)-12*	1-33/64 (1.5156)	1-17/32 (1.5312)	2.000	2.750	3.500	4.250	5.000	1.833	2.583	3.333	4.083	4.833

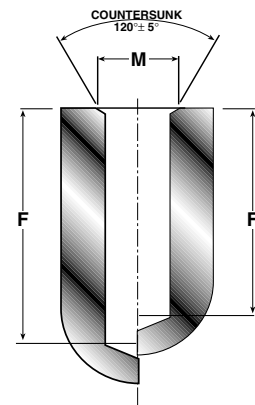
\*Standard size drills are suggested even though in these sizes they vary slightly from minor diameter specifications in NASM3537.

For Plug Taps 5/16" or M8 and smaller: F = Insert Nominal Length (Q) + .5 (Bolt Nominal Diameter) + 4P (Tap Chamfer) + 1P (allowance for countersink and maximum insert set-down).

For Plug Taps 3/8" or M10 and larger: F = Insert Nominal Length

(Q) + 4P (Tap Chamfer) + 1P (allowance for countersink and maximum insert set-down).

For Bottoming Taps: F = Insert Nominal Length (Q) + 2P (Tap Chamfer) + 1P (allowance for countersink and maximum insert set-down).



**TABLE VI – METRIC DRILLED HOLE DIMENSIONS**

Nominal Thread Size	Minor Diameter		Suggested Drill Size		"F" MINIMUM DRILLING DEPTH FOR EACH INSERT LENGTH									
	Min.	Max.	Aluminum	Steel, Magnesium, Plastic	Plug Taps					Bottoming Taps				
					1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.	1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.
<b>METRIC COARSE</b>														
M2X0.4	2.087	2.170	2.1	2.1	5.40	6.40	7.40	8.40	9.40	3.60	4.60	5.60	6.60	7.60
M2.2x0.45	2.297	2.397	2.3	2.35	6.00	7.10	8.20	9.30	10.40	4.00	5.10	6.20	7.30	8.40
M2.5x0.45	2.597	2.697	2.55	2.65	6.45	7.70	8.95	10.20	11.45	4.30	5.55	6.80	8.05	9.30
M3x0.5	3.108	3.220	3.15	3.2	7.50	9.00	10.50	12.00	13.50	5.00	6.50	8.00	9.50	11.00
M3.5x0.6	3.630	3.755	3.7	3.7	8.85	10.60	12.35	14.10	15.85	5.90	7.65	9.40	11.15	12.90
M4x0.7	4.152	4.292	4.2	4.25	10.20	12.20	14.20	16.20	18.20	6.80	8.80	10.80	12.80	14.80
M5x0.8	5.174	5.334	5.2	5.3	12.30	14.80	17.30	19.80	22.30	8.20	10.70	13.20	15.70	18.20
M6x1	6.217	6.407	6.25	6.3	15.00	18.00	21.00	24.00	27.00	10.00	13.00	16.00	19.00	22.00
M7x1	7.217	7.407	7.25	7.3	16.50	20.00	23.50	27.00	30.50	11.00	14.50	18.00	21.50	25.00
M8x1.25	8.271	8.483	8.3	8.4	19.50	23.50	27.50	31.50	35.50	13.00	17.00	21.00	25.00	29.00
M10x1.5	10.324	10.560	10.5	10.5	19.00	24.00	29.00	34.00	39.00	16.00	21.00	26.00	31.00	36.00
M12x1.75	12.379	12.644	12.5	12.5	22.50	28.50	34.50	40.50	46.50	19.00	25.00	31.00	37.00	43.00
M14x2	14.433	14.733	14.5	14.5	26.00	33.00	40.00	47.00	54.00	22.00	29.00	36.00	43.00	50.00
M16x2	16.433	16.733	16.5	16.5	28.00	36.00	44.00	52.00	60.00	24.00	32.00	40.00	48.00	56.00
M18x2.5	18.541	18.896	18.75	18.75	33.00	42.00	51.00	60.00	69.00	28.00	37.00	46.00	55.00	64.00
M20x2.5	20.541	20.896	20.75	20.75	35.00	45.00	55.00	65.00	75.00	30.00	40.00	50.00	60.00	70.00
M22x2.5	22.541	22.896	22.75	22.75	37.00	48.00	59.00	70.00	81.00	32.00	43.00	54.00	65.00	76.00
M24x3	24.649	25.049	24.75	24.75	42.00	54.00	66.00	78.00	90.00	36.00	48.00	60.00	72.00	84.00
M27x3	27.649	28.049	27.75	27.75	45.00	58.50	72.00	85.50	99.00	39.00	52.50	66.00	79.50	93.00
M30x3.5	30.757	31.207	31	31	51.00	66.00	81.00	96.00	111.00	44.00	59.00	74.00	89.00	104.00
M33x3.5	33.757	34.207	34	34	54.00	70.50	87.00	103.50	120.00	47.00	63.50	80.00	96.50	113.00
M36x4	36.866	37.341	37	37	60.00	78.00	96.00	114.00	132.00	52.00	70.00	88.00	106.00	124.00
M39x4	39.866	40.341	40	40	63.00	82.50	102.00	121.50	141.00	55.00	74.50	94.00	113.50	133.00
<b>METRIC FINE</b>														
M8x1	8.217	8.407	8.25	8.3	18.00	22.00	26.00	30.00	34.00	12.00	16.00	20.00	24.00	28.00
M10x1	10.217	10.407	10.25	10.25	16.00	21.00	26.00	31.00	36.00	14.00	19.00	24.00	29.00	34.00
M10x1.25*	10.271	10.483	10.25	10.25	17.50	22.50	27.50	32.50	37.50	15.00	20.00	25.00	30.00	35.00
M12x1.25*	12.271	12.483	12.25	12.25	19.50	25.50	31.50	37.50	43.50	17.00	23.00	29.00	35.00	41.00
M12x1.5*	12.324	12.560	12.25	12.5	21.00	27.00	33.00	39.00	45.00	18.00	24.00	30.00	36.00	42.00
M14x1.5*	14.324	14.560	14.25	14.5	23.00	30.00	37.00	44.00	51.00	20.00	27.00	34.00	41.00	48.00
M16x1.5*	16.324	16.560	16.25	16.5	25.00	33.00	41.00	49.00	57.00	22.00	30.00	38.00	46.00	54.00
M18x1.5*	18.324	18.560	18.25	18.5	27.00	36.00	45.00	54.00	63.00	24.00	33.00	42.00	51.00	60.00
M20x1.5*	20.324	20.560	20.25	20.5	29.00	39.00	49.00	59.00	69.00	26.00	36.00	46.00	56.00	66.00
M22x1.5*	22.324	22.560	22.25	22.5	31.00	42.00	53.00	64.00	75.00	28.00	39.00	50.00	61.00	72.00
M18x2	18.433	18.733	18.5	18.5	30.00	39.00	48.00	57.00	66.00	26.00	35.00	44.00	53.00	62.00
M20x2	20.433	20.733	20.5	20.5	32.00	42.00	52.00	62.00	72.00	28.00	38.00	48.00	58.00	68.00
M22x2	22.433	22.733	22.5	22.5	34.00	45.00	56.00	67.00	78.00	30.00	41.00	52.00	63.00	74.00
M24x2	24.433	24.733	24.5	24.5	36.00	48.00	60.00	72.00	84.00	32.00	44.00	56.00	68.00	80.00
M27x2	27.433	27.733	27.5	27.5	39.00	52.50	66.00	79.50	93.00	35.00	48.50	62.00	75.50	89.00
M30x2	30.433	30.733	30.5	30.5	42.00	57.00	72.00	87.00	102.00	38.00	53.00	68.00	83.00	98.00
M33x2	33.433	33.733	33.5	33.5	45.00	61.50	78.00	94.50	111.00	41.00	57.50	74.00	90.50	107.00
M36x2	36.433	36.733	36.5	36.5	48.00	66.00	84.00	102.00	120.00	44.00	62.00	80.00	98.00	116.00
M39x2	39.433	39.733	39.5	39.5	51.00	70.50	90.00	109.00	129.00	47.00	66.50	86.00	105.50	125.00
M36x3	36.649	37.049	37	37	54.00	72.00	90.00	108.00	126.00	48.00	66.00	84.00	102.00	120.00
M39x3	39.649	40.049	40	40	57.00	76.50	96.00	115.50	135.00	51.00	70.50	90.00	109.50	129.00

\* Standard size drills are suggested even though in these sizes they vary slightly from minor diameter limits.



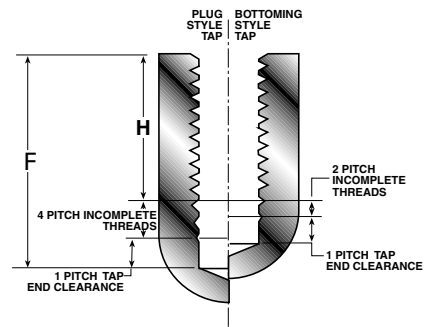
# Heli-Coil tapping data – inch

The *minimum* tapping depths shown below (Dimension H) is the **MINIMUM** for countersunk holes and an insert set-down of 1 – 1/2 pitch maximum. The calculation for Dimension “H” is:

$$H = \text{Insert Nominal Length (Q)} + 1P$$

The tapped hole must be held within the stated pitch diameter limits for the required class of fit for the installed Heli-Coil insert.

When anodize, Iridite or other finishes are used, all tapped hole dimensions must be met after the finishes are applied.



**TABLE VII – INCH TAPPED HOLE DIMENSIONS**

Nominal Thread Size	Countersink "M" Diameter (120° ±5° included angle)		Pitch Diameter			"H" MINIMUM TAPPING DEPTH					Minor Diameter (after tapping)		Tap Major Dia.. Max.	Thread Pitch P
	Min.	Max.	Min.	3B Max.	2B Max.	INSERT LENGTH					Min.	Max.		
						1D	1-1/2D	2D	1-1/2D	3D				
<b>UNIFIED COARSE</b>														
1 (.073)-64	.085	.10	.0832	.0843	.0850	.090	.125	.160	.200	.235	.0764	.0823	.0958	.01563
2 (.086)-56	.09	.11	.0976	.0989	.0996	.100	.150	.190	.230	.280	.0899	.0961	.1117	.01786
3 (.099)-48	.11	.14	.1126	.1140	.1148	.120	.170	.220	.270	.320	.1036	.1104	.1289	.02083
4 (.112)-40	.14	.17	.1283	.1299	.1308	.140	.190	.250	.310	.360	.1175	.1252	.1473	.02500
5 (.125)-40	.16	.19	.1413	.1430	.1438	.150	.210	.280	.340	.400	.1305	.1373	.1603	.02500
6 (.138)-32	.18	.21	.1583	.1601	.1611	.170	.240	.310	.380	.450	.1448	.1527	.1817	.03125
8 (.164)-32	.20	.23	.1843	.1862	.1872	.200	.280	.360	.440	.520	.1708	.1781	.2077	.03125
10 (.190)-24	.24	.27	.2170	.2192	.2203	.230	.330	.420	.520	.610	.1990	.2080	.2475	.04167
12 (.216)-24	.26	.29	.2430	.2453	.2464	.260	.370	.470	.580	.690	.2250	.2340	.2735	.04167
1/4 (.2500)-20	.31	.34	.2825	.2851	.2864	.300	.430	.550	.680	.800	.2608	.2704	.3187	.05000
5/16 (.3125)-18	.38	.41	.3486	.3515	.3529	.370	.530	.680	.840	.990	.3245	.3342	.3884	.05556
3/8 (.3750)-16	.45	.48	.4156	.4189	.4203	.440	.630	.810	1.000	1.190	.3885	.3987	.4602	.06250
7/16 (.4375)-14	.52	.55	.4839	.4875	.4890	.510	.730	.950	1.170	1.380	.4530	.4639	.5343	.07143
1/2 (.5000)-13	.59	.62	.5499	.5537	.5554	.580	.830	1.080	1.330	1.580	.5166	.5273	.6042	.07692
9/16 (.5625)-12	.66	.69	.6167	.6208	.6225	.650	.930	1.210	1.490	1.770	.5806	.5918	.6751	.08333
5/8 (.6250)-11	.73	.76	.6841	.6885	.6903	.720	1.030	1.340	1.650	1.970	.6447	.6564	.7477	.09091
3/4 (.7500)-10	.87	.90	.8149	.8196	.8216	.850	1.230	1.600	1.980	2.350	.7716	.7838	.8850	.10000
7/8 (.8750)-9	1.00	1.03	.9471	.9522	.9543	.990	1.420	1.860	2.300	2.740	.8990	.9119	1.0247	.11111
1 (1.000)-8	1.14	1.17	1.0812	1.0868	1.0890	1.130	1.630	2.130	2.630	3.130	1.0271	1.0421	1.1681	.12500
1-1/8 (1.1250)-7	1.29	1.32	1.2178	1.2239	1.2262	1.270	1.830	2.390	2.960	3.520	1.1559	1.1730	1.3171	.14286
1-1/4 (1.2500)-7	1.41	1.44	1.3428	1.3490	1.3514	1.390	2.020	2.640	3.270	3.890	1.2809	1.2980	1.4421	.14286
1-3/8 (1.3750)-6	1.56	1.59	1.4832	1.4900	1.4926	1.540	2.230	2.920	3.600	4.290	1.4110	1.4310	1.5982	.16667
1-1/2 (1.5000)-6	1.69	1.72	1.6082	1.6151	1.6177	1.670	2.420	3.170	3.920	4.670	1.5360	1.5560	1.7232	.16667
<b>UNIFIED FINE</b>														
2 (.086)-64	.09	.11	.0962	.0974	.0981	.100	.145	.190	.230	.275	.0894	.0947	.1088	.01563
3 (.099)-56	.11	.14	.1106	.1119	.1126	.120	.170	.220	.270	.310	.1029	.1086	.1247	.01786
4 (.112)-48	.14	.17	.1256	.1271	.1279	.130	.190	.240	.300	.360	.1166	.1229	.1419	.02083
6 (.138)-40	.17	.20	.1543	.1560	.1569	.160	.230	.300	.370	.440	.1435	.1503	.1733	.02500
8 (.164)-36	.20	.23	.1821	.1840	.1849	.190	.270	.360	.440	.520	.1701	.1771	.2032	.02778
10 (.190)-32	.23	.26	.2103	.2123	.2133	.220	.320	.410	.510	.600	.1968	.2041	.2337	.03125
1/4 (.2500)-28	.29	.32	.2732	.2754	.2765	.290	.410	.540	.660	.790	.2577	.2646	.2995	.03571
5/16 (.3125)-24	.36	.39	.3395	.3421	.3433	.350	.510	.670	.820	.980	.3215	.3288	.3700	.04167
3/8 (.3750)-24	.42	.45	.4020	.4047	.4059	.420	.600	.790	.980	1.170	.3840	.3910	.4325	.04167
7/16 (.4375)-20	.50	.53	.4700	.4731	.4744	.490	.710	.930	1.140	1.360	.4483	.4561	.5062	.05000
1/2 (.5000)-20	.56	.59	.5325	.5357	.5371	.550	.800	1.050	1.300	1.550	.5108	.5186	.5687	.05000
9/16 (.5625)-18	.63	.66	.5986	.6020	.6035	.620	.900	1.180	1.460	1.740	.5745	.5826	.6384	.05556
5/8 (.6250)-18	.69	.72	.6611	.6646	.6661	.680	.990	1.310	1.620	1.930	.6370	.6451	.7009	.05556
3/4 (.7500)-16	.82	.85	.7906	.7945	.7961	.810	1.190	1.560	1.940	2.310	.7635	.7720	.8352	.06250
7/8 (.8750)-14	.96	.99	.9214	.9257	.9274	.950	1.380	1.820	2.260	2.700	.8905	.8994	.9718	.07143
1 (1.000)-14	1.08	1.11	1.0464	1.0508	1.0527	1.070	1.570	2.070	2.570	3.070	1.0155	1.0243	1.0968	.07143
1 (1.000)-12	1.10	1.13	1.0542	1.0589	1.0608	1.080	1.580	2.080	2.580	3.080	1.0181	1.0281	1.1126	.08333
1-1/8 (1.1250)-12	1.22	1.25	1.1792	1.1841	1.1860	1.210	1.770	2.330	2.900	3.460	1.1431	1.1531	1.2376	.08333
1-1/4 (1.2500)-12	1.35	1.38	1.3042	1.3092	1.3112	1.330	1.960	2.580	3.210	3.830	1.2681	1.2781	1.3626	.08333
1-3/8 (1.3750)-12	1.47	1.50	1.4292	1.4343	1.4364	1.460	2.150	2.830	3.520	4.210	1.3931	1.4031	1.4876	.08333
1-1/2 (1.5000)-12	1.60	1.63	1.5542	1.5595	1.5615	1.580	2.330	3.080	3.830	4.580	1.5181	1.5281	1.6126	.08333

Heli-Coil taps in various types and styles produce holes for Tolerance Classes 4H5H and 5H for use in the general range of aluminums, magnesiums, mild steels, free machining stainless steels and other free machining materials.

Conventional shop practice and production procedures, speeds, feeds and lubricants should be used in combination with proper fixturing and good tapping machines or tapping heads. The tapped hole must be held within the stated pitch diameter

limits for the required Tolerance Class of fit for the installed Heli-Coil insert. For Standard (free running inserts), a tolerance class 5H is recommended. For Screw-Lock inserts, a tolerance class 4H5H is recommended in order to develop higher locking torques.

**TABLE VIII – METRIC TAPPED HOLE DIMENSIONS**

Nominal Thread Size	"M" Countersink Diameter		Pitch Diameter			"H" MINIMUM TAPPING DEPTH					Tap Major Dia. Max.
	Max.	Min.	Min.	4 H Max.	5H Max.	1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.	
<b>METRIC COARSE</b>											
M2X0.4	2.30	2.70	2.260	2.295	2.310	2.4	3.4	4.4	5.4	6.4	2.581
M2.2x0.45	2.90	2.40	2.492	2.532	2.547	2.7	3.8	4.9	6.0	7.1	2.845
M2.5x0.45	3.40	2.90	2.792	2.832	2.847	3.0	4.2	5.5	6.7	8.0	3.145
M3x0.5	4.00	3.40	3.325	3.367	3.384	3.5	5.0	6.5	8.0	9.5	3.716
M3.5x0.6	4.70	4.10	3.890	3.940	3.959	4.1	5.9	7.6	9.4	11.1	4.354
M4x0.7	5.30	4.70	4.455	4.509	4.529	4.7	6.7	8.7	10.7	12.7	5.007
M5x0.8	6.40	5.80	5.520	5.577	5.597	5.8	8.3	10.8	13.3	15.8	6.145
M6x1	7.70	7.10	6.650	6.719	6.742	7.0	10.0	13.0	16.0	19.0	7.422
M7x1	8.70	8.10	7.650	7.719	7.742	8.0	11.5	15.0	18.5	22.0	8.422
M8x1.25	10.10	9.50	8.812	8.886	8.911	9.3	13.3	17.3	21.3	25.3	9.787
M10x1.5	12.40	11.80	10.974	11.061	11.089	11.5	16.5	21.5	26.5	31.5	12.131
M12x1.75	14.80	14.20	13.137	13.236	13.271	13.8	19.8	25.8	31.8	37.8	14.478
M14x2	17.10	16.50	15.299	15.406	15.444	16.0	23.0	30.0	37.0	44.0	16.822
M16x2	19.10	18.50	17.299	17.406	17.444	18.0	26.0	34.0	42.0	50.0	18.822
M18x2.5	21.80	21.20	19.624	19.738	19.778	20.5	29.5	38.5	47.5	56.5	21.513
M20x2.5	23.80	23.20	21.624	21.738	21.778	22.5	32.5	42.5	52.5	62.5	23.513
M22x2.5	25.50	25.20	23.624	23.738	23.778	24.5	35.5	46.5	57.5	68.5	25.513
M24x3	28.50	27.90	25.948	26.093	26.135	27.0	39.0	51.0	63.0	75.0	28.238
M27x3	31.50	30.90	28.948	29.093	29.135	30.0	43.5	57.0	70.5	84.0	31.238
M30x3.5	35.20	34.60	32.273	32.428	32.472	33.5	48.5	63.5	78.5	93.5	34.925
M33x3.5	38.20	37.60	35.273	35.428	35.472	36.5	53.0	69.5	86.0	102.5	37.925
M36x4	41.90	41.30	38.598	38.763	38.809	40.0	58.0	76.0	94.0	112.0	41.615
M39x4	44.90	44.30	41.598	41.763	41.809	43.0	62.5	82.0	101.5	121.0	44.615
<b>METRIC FINE</b>											
M8x1	9.70	9.10	8.650	8.719	8.742	9.0	13.0	17.0	21.0	25.0	9.422
M10x1	11.70	11.10	10.650	10.719	10.742	11.0	16.0	21.0	26.0	31.0	11.422
M10x1.25	12.10	11.50	10.812	10.886	10.911	11.3	16.3	21.3	26.3	31.3	11.787
M12x1.25	14.10	13.50	12.812	12.898	12.926	13.3	19.3	25.3	31.3	37.3	13.787
M12x1.5	14.40	13.80	12.974	13.067	13.099	13.5	19.5	25.5	31.5	37.5	14.131
M14x1.5	16.40	15.80	14.974	15.067	15.099	15.5	22.5	29.5	36.5	43.5	16.131
M16x1.5	18.40	17.80	16.974	17.067	17.099	17.5	25.5	33.5	41.5	49.5	18.131
M18x1.5	20.40	19.80	18.974	19.067	19.099	19.5	28.5	37.5	46.5	55.5	20.131
M20x1.5	22.40	21.80	20.974	21.067	21.099	21.5	31.5	41.5	51.5	61.5	22.131
M22x1.5	24.40	23.80	22.974	23.067	23.099	23.5	34.5	45.5	56.5	67.5	24.131
M18x2	21.10	20.50	19.299	19.406	19.444	20.0	29.0	38.0	47.0	56.0	20.822
M20x2	23.10	22.50	21.299	21.406	21.444	22.0	32.0	42.0	52.0	62.0	22.822
M22x2	25.10	24.50	23.299	23.406	23.444	24.0	35.0	46.0	57.0	68.0	24.822
M24x2	27.10	26.50	25.299	25.414	25.454	26.0	38.0	50.0	62.0	74.0	26.822
M27x2	30.10	29.50	28.299	28.414	28.454	29.0	42.5	56.0	69.5	83.0	29.822
M30x2	33.10	32.50	31.299	31.414	31.454	32.0	47.0	62.0	77.0	92.0	32.822
M33x2	36.10	35.50	34.299	34.414	34.454	35.0	51.5	68.0	84.5	101.0	35.822
M36x2	39.10	38.50	37.299	37.414	37.454	38.0	56.0	74.0	92.0	110.0	38.822
M39x2	42.10	41.50	40.299	40.414	40.454	41.0	60.5	80.0	99.5	119.0	41.822
M36x3	40.50	39.90	37.948	38.093	38.135	39.0	57.0	75.0	93.0	111.0	40.238
M39x3	43.50	42.90	40.948	41.093	41.135	42.0	61.5	81.0	100.5	120.0	43.238

# Heli-Coil STI tap part numbers – inch

**STRAIGHT FLUTE TAPS.** Widely used for general hand and machine tapping operations. Available in sizes thru 1-1/2".

- **Plug Style – (4 Thread Chamfer).** Used in thru holes and blind holes that allow for ample chip clearance. Easier to start and require less tapping torque than bottoming taps.

- **Bottoming Style – (2 Thread Chamfer).** Used in blind holes drilled to a minimum depth that requires threads be close to the bottom of the hole.

**SPIRAL POINTED – PLUG & SPIRAL FLUTE.** Used for efficient chip disposal in production tapping operations. Available in sizes thru 1/2".

- **Spiral Pointed - Plug (4 Thread Chamfer).** Incorporates an angular grind at the point end of the tap which shears chips and drives them forward of the tap. Used widely in long thru holes and blind holes with ample chip clearance. They are free cutting and provide increased tap strength. Not recommended for abrasive materials.

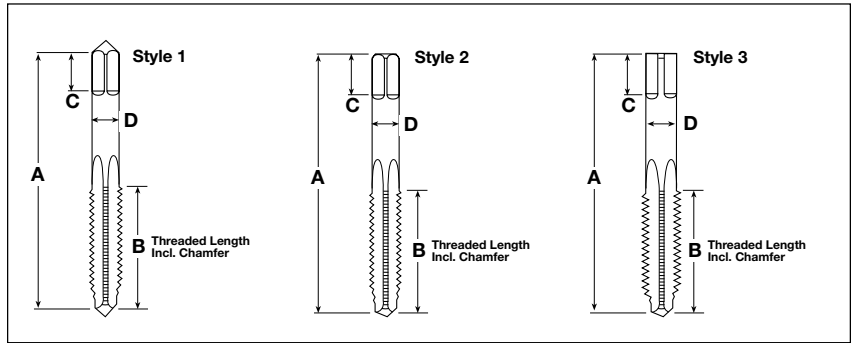
**TABLE IX – HELI-COIL STI TAP PART NUMBERS**

Nominal Thread Size	Straight Flute				Spiral Point		High Spiral Flute		Roughing Tap
	Plug		Bottoming		Plug		Bottoming		
	3B	2B	3B	2B	3B	2B	3B	2B	
<b>UNIFIED COARSE</b>									
1 (.073)-64	01CPB	01CPA	01CBB	01CBA	01CSB	01CSA	5905-01	6905-01	
2 (.086)-56	02CPB	02CPA	02CBB	02CBA	02CSB	02CSA	5905-02	6905-02	
3 (.099)-48	03CPB	03CPA	03CBB	03CBA	03CSB	03CSA	5905-03	6905-03	
4 (.112)-40	04CPB	04CPA	04CBB	04CBA	04CSB	04CSA	5905-04	6905-04	
5 (.125)-40	05CPB	05CPA	05CBB	05CBA	05CSB	05CSA	5905-05	6905-05	
6 (.138)-32	06CPB	06CPA	06CBB	06CBA	06CSB	06CSA	5905-06	6905-06	
8 (.164)-32	2CPB	2CPA	2CBB	2CBA	2CSB	2CSA	5905-2	6905-2	
10 (.190)-24	3CPB	3CPA	3CBB	3CBA	3CSB	3CSA	5905-3	6905-3	
12 (.216)-24	1CPB	1CPA	1CBB	1CBA	1CSB	1CSA	5905-1	6905-1	
1/4 (.2500)-20	4CPB	4CPA	4CBB	4CBA	4CSB	4CSA	5905-4	6905-4	
5/16 (.3125)-18	5CPB	5CPA	5CBB	5CBA	5CSB	5CSA	5905-5	6905-5	
3/8 (.3750)-16	6CPB	6CPA	6CBB	6CBA	6CSB	6CSA	5905-6	6905-6	
7/16 (.4375)-14	7CPB	7CPA	7CBB	7CBA	7CSB	7CSA	5905-7	6905-7	7CRU
1/2 (.5000)-13	8CPB	8CPA	8CBB	8CBA	8CSB	8CSA	5905-8	6905-8	8CRU
9/16 (.5625)-12	187-9	38187-9	4187-9	43187-9					9CRU
5/8 (.6250)-11	8187-10	18187-10	10187-10	20187-10					10CRU
3/4 (.7500)-10	8187-12	18187-12	10187-12	20187-12					12CRU
7/8 (.8750)-9	8187-14	18187-14	10187-14	20187-14					14CRU
1 (1.0000)-8	8187-16	18187-16	10187-16	20187-16					16CRU
1-1/8 (1.1250)-7	8187-18	18187-18	10187-18	20187-18					
1-1/4 (1.2500)-7	8187-20	18187-20	10187-20	20187-20					
1-3/8 (1.3750)-6	8187-22	18187-22	10187-22	20187-22					
1-1/2 (1.5000)-6	8187-24	18187-24	10187-24	20187-24					
<b>UNIFIED FINE</b>									
2 (.086)-64	02FPB	02FPA	02FBB	02FBA	02FSB	02FSA	5906-02	6906-02	
3 (.099)-56	03FPB	03FPA	03FBB	03FBA	03FSB	03FSA	5906-03	6906-03	
4 (.112)-48	04FPB	04FPA	04FBB	04FBA	04FSB	04FSA	5906-04	6906-04	
6 (.138)-40	06FPB	06FPA	06FBB	06FBA	06FSB	06FSA	5906-06	6906-06	
8 (.164)-36	2FPB	2FPA	2FBB	2FBA	2FSB	2FSA	5906-2	6906-2	
10 (.190)-32	3FPB	3FPA	3FBB	3FBA	3FSB	3FSA	5906-3	6906-3	
1/4 (.2500)-28	4FPB	4FPA	4FBB	4FBA	4FSB	4FSA	5906-4	6906-4	
5/16 (.3125)-24	5FPB	5FPA	5FBB	5FBA	5FSB	5FSA	5906-5	6906-5	
3/8 (.3750)-24	6FPB	6FPA	6FBB	6FBA	6FSB	6FSA	5906-6	6906-6	
7/16 (.4375)-20	7FPB	7FPA	7FBB	7FBA	7FSB	7FSA	5906-7	6906-7	7FRU
1/2 (.5000)-20	8FPB	8FPA	8FBB	8FBA	8FSB	8FSA	5906-8	6906-8	8FRU
9/16 (.5625)-18	38193-9	18193-9	43193-9	20193-9					9FRU
5/8 (.6250)-18	8193-10	18193-10	10193-10	20193-10					10FRU
3/4 (.7500)-16	8193-12	18193-12	10193-12	20193-12					12FRU
7/8 (.8750)-14	8193-14	18193-14	10193-14	20193-14					14FRU
1 (1.0000)-14	8193-16	18193-16	10193-16	20193-16					16FRU
1 (1.0000)-12	8193-161	18193-161	10193-161	20193-161					161FRU
1-1/8 (1.1250)-12	8193-18	18193-18	10193-18	20193-18					
1-1/4 (1.2500)-12	8193-20	18193-20	10193-20	20193-20					
1-3/8 (1.3750)-12	8193-22	18193-22	10193-22	20193-22					
1-1/2 (1.5000)-12	8193-24	18193-24	10193-24	20193-24					

# Heli-Coil STI tap dimensions – inch

- **High Spiral Flute - Bottoming (2 Thread Chamfer).** Have spiral flute for efficiently pulling stringy chips out of deep or blind holes in soft materials.

**ROUGHING TAPS.** Are available for difficult tapping operations where it is desirable to reduce the load on the finishing tap. Available in sizes 7/16 – 1".



**TABLE X – HELI-COIL STI TAP DIMENSIONS**

Nominal Thread Size	Tap Dimensions					Number of Flutes			Tap Style*	H Limits	
	Length Overall A	Length Of Thread B	Length Of Square C	Max Dia Of Shank D	Max Size Of Square	Straight Flute	Spiral Point Plug	Spiral Flute Bott.		3B	2B
<b>UNIFIED COARSE</b>											
1 (.073)-64	1-13/16	1/2	3/16	.141	.110	3	2	2	1	H1	H2
2 (.086)-56	1-7/8	9/16	3/16	.141	.110	3	2	2	1	H1	H2
3 (.099)-48	1-15/16	5/8	3/16	.141	.110	3	2	2	1	H1	H2
4 (.112)-40	2	11/16	3/16	.141	.110	3	2	2	1	H1	H2
5 (.125)-40	2-1/8	3/4	1/4	.168	.131	3	2	3	1	H1	H2
6 (.138)-32	2-3/8	7/8	1/4	.194	.152	3	2	3	1	H2	H3
8 (.164)-32	2-3/8	15/16	9/32	.220	.165	3	2	3	1	H2	H3
10 (.190)-24	2-1/2	1	5/16	.255	.191	3	2	3	2	H2	H3
12 (.216)-24	2-23/32	1-1/8	3/8	.318	.238	3	2	3	2	H2	H3
1/4 (.2500)-20	2-23/32	1-1/8	3/8	.318	.238	3	2	3	2	H2	H3
5/16 (.3125)-18	2-15/16	1-1/4	7/16	.381	.286	4	3	3	2	H3	H4
3/8 (.3750)-16	3-3/8	1-21/32	7/16	.367	.275	4	3	3	3	H3	H4
7/16 (.4375)-14	3-19/32	1-21/32	1/2	.429	.322	4	3	4	3	H3	H4
1/2 (.5000)-13	3-13/16	1-13/16	9/16	.480	.360	4	3	4	3	H3	H4
9/16 (.5625)-12	4-1/32	1-13/16	5/8	.542	.406	4	–	–	3	H3	H4
5/8 (.6250)-11	4-1/4	2	11/16	.590	.442	4	–	–	3	H3	H4
3/4 (.7500)-10	4-11/16	2-7/32	3/4	.697	.523	4	–	–	3	H3	H5
7/8 (.8750)-9	5-1/18	2-1/2	13/16	.800	.600	4	–	–	3	H3	H5
1 (1.000)-8	5-3/4	2-9/16	1	1.021	.766	4	–	–	3	H4	H6
1-1/8 (1.1250)-7	6-1/16	3	1-1/16	1.108	.831	4	–	–	3	H4	H6
1-1/4 (1.2500)-7	6-3/8	3	1-1/8	1.233	.925	4	–	–	3	H4	H6
1-3/8 (1.3750)-6	6-11/16	3-3/16	1-1/8	1.305	.979	6	–	–	3	H6	H8
1-1/2 (1.5000)-6	7	3-3/16	1-1/4	1.430	1.072	6	–	–	3	H6	H8
<b>UNIFIED FINE</b>											
2 (.086)-64	1-7/8	9/16	3/16	.141	.110	3	2	2	1	H1	H2
3 (.099)-56	1-15/16	5/8	3/16	.141	.110	3	2	2	1	H1	H2
4 (.112)-48	2	11/16	3/16	.141	.110	3	2	2	1	H1	H2
6 (.138)-40	2-1/8	3/4	1/4	.168	.131	3	2	3	1	H1	H2
8 (.164)-36	2-3/8	15/16	9/32	.220	.165	3	2	3	1	H1	H2
10 (.190)-32	2-1/2	1	5/16	.255	.191	3	2	3	2	H2	H3
1/4 (.2500)-28	2-23/32	1-1/8	3/8	.318	.238	3	2	3	2	H2	H3
5/16 (.3125)-24	2-15/16	1-1/4	7/16	.381	.286	4	3	3	2	H2	H3
3/8 (.3750)-24	3-5/32	1-7/16	13/32	.323	.242	4	3	3	3	H2	H3
7/16 (.4375)-20	3-3/8	1-21/32	7/16	.367	.275	4	3	3	3	H3	H4
1/2 (.5000)-20	3-19/32	1-21/32	1/2	.429	.322	4	3	4	3	H3	H4
9/16 (.5625)-18	3-13/16	1-13/16	9/16	.480	.360	4	–	–	3	H3	H4
5/8 (.6250)-18	4-1/32	1-13/16	5/8	.542	.406	4	–	–	3	H3	H4
3/4 (.7500)-16	4-15/32	2	11/16	.652	.489	4	–	–	3	H3	H4
7/8 (.8750)-14	5-1/8	2-1/2	13/16	.800	.600	4	–	–	3	H3	H4
1 (1.0000)-14	5-7/16	2-9/16	7/8	.896	.672	4	–	–	3	H4	H6
1 (1.0000)-12	5-7/16	2-9/16	7/8	.896	.672	4	–	–	3	H4	H6
1-1/8 (1.1250)-12	5-3/4	2-9/16	1	1.021	.766	6	–	–	3	H4	H6
1-1/4 (1.2500)-12	6-1/16	3	1-1/16	1.108	.831	6	–	–	3	H4	H6
1-3/8 (1.3750)-12	6-3/8	3	1-1/8	1.233	.925	6	–	–	3	H4	H6
1-1/2 (1.5000)-12	6-11/16	3-3/16	1-1/8	1.305	.979	6	–	–	3	H4	H6

\* NOTE: All bottoming taps have male center on thread end removed.



# Heli-Coil STI tap part numbers – metric

## STRAIGHT FLUTE TAPS.

Widely used for general hand and machine tapping operations. Available in sizes thru 39mm.

- **Plug Style – (4 Thread Chamfer).** Used in thru holes and in blind holes that allow for ample chip clearance. Easier to start and require less tapping torque than bottoming taps.

- **Bottoming Style – (2 Thread Chamfer).** Used in blind holes drilled to a minimum depth that requires threads be close to the bottom of the hole.

**SPIRAL POINTED – PLUG & SPIRAL FLUTE.** Used for efficient chip disposal in production tapping operations. Available in sizes thru 12mm.

- **Spiral Pointed - Plug (4 Thread Chamfer).** Incorporates an angular grind at the point end of the tap which shears chips and drives them forward of the tap. Used widely in long thru holes and blind holes with ample chip clearance. They are free cutting and provide increased tap strength. Not recommended for abrasive materials.

**TABLE XI – HELI-COIL STI TAP PART NUMBERS**

Nominal Thread Size	Straight Flute				Spiral Point		High Spiral Flute		Roughing Tap
	Plug		Bottoming		Plug		Bottoming		
	4H5H	5H	4H5H	5H	4H5H	5H	4H5H	5H	
<b>METRIC COARSE</b>									
M2X0.4	4687-2	2087-2	4693-2	2093-2	4863-2	4763-2	5081-2	4681-2	
M2.2x0.45	4687-2.2	2087-2.2	4693-2.2	2093-2.2	4863-2.2	4763-2.2	5081-2.2	4681-2.2	
M2.5x0.45	4687-2.5	2087-2.5	4693-2.5	2093-2.5	4863-2.5	4763-2.5	5081-2.5	4681-2.5	
M3x0.5	4687-3	2087-3	4693-3	2093-3	4863-3	4763-3	5081-3	4681-3	
M3.5x0.6	4687-3.5	2087-3.5	4693-3.5	2093-3.5	4863-3.5	4763-3.5	5081-3.5	4681-3.5	
M4x0.7	4687-4	2087-4	4693-4	2093-4	4863-4	4763-4	5081-4	4681-4	
M5x0.8	4687-5	2087-5	4693-5	2093-5	4863-5	4763-5	5081-5	4681-5	
M6x1	4687-6	2087-6	4693-6	2093-6	4863-6	4763-6	5081-6	4681-6	
M7x1	4687-7	2087-7	4693-7	2093-7	4863-7	4763-7	5081-7	4681-7	
M8x1.25	4687-8	2087-8	4693-8	2093-8	4863-8	4763-8	5081-8	4681-8	
M10x1.5	4687-10	2087-10	4693-10	2093-10	4863-10	4763-10	5081-10	4681-10	
M12x1.75	4687-12	2087-12	4693-12	2093-12	4863-12	4763-12	5081-12	4681-12	3765-12
M14x2	4687-14	2087-14	4693-14	2093-14					3765-14
M16x2	4687-16	2087-16	4693-16	2093-16					3765-16
M18x2.5	4687-18	2087-18	4693-18	2093-18					3765-18
M20x2.5	4687-20	2087-20	4693-20	2093-20					3765-20
M22x2.5	4687-22	2087-22	4693-22	2093-22					3765-22
M24x3	4687-24	2087-24	4693-24	2093-24					3765-24
M27x3	4687-27	2087-27	4693-27	2093-27					
M30x3.5	4687-30	2087-30	4693-30	2093-30					
M33x3.5	4687-33	2087-33	4693-33	2093-33					
M36x4	4687-36	2087-36	4693-36	2093-36					
M39x4	4687-39	2087-39	4693-39	2093-39					
<b>METRIC FINE</b>									
M8x1	5484-8	4984-8	5486-8	4986-8	4864-8	4764-8	5066-8	4666-8	
M10x1	5484-10	4984-10	5486-10	4986-10	4864-10	4764-10	5066-10	4666-10	
M10x1.25	5444-10	4944-10	5445-10	4945-10	4865-10	4765-10	5067-10	4667-10	
M12x1.25	5444-12	4944-12	5445-12	4945-12	4865-12	4765-12	5067-12	4667-12	3767-12
M12x1.5	5476-12	4976-12	5477-12	4977-12	4866-12	4766-12	5068-12	4668-12	3768-12
M14x1.5	5476-14	4976-14	5477-14	4977-14					3768-14
M16x1.5	5476-16	4976-16	5477-16	4977-16					3768-16
M18x1.5	5476-18	4976-18	5477-18	4977-18					3768-18
M20x1.5	5476-20	4976-20	5477-20	4977-20					3768-20
M22x1.5	5476-22	4976-22	5477-22	4977-22					3768-22
M18x2	5490-18	4990-18	5492-18	4992-18					3769-18
M20x2	5490-20	4990-20	5492-20	4992-20					3769-20
M22x2	5490-22	4990-22	5492-22	4992-22					3769-22
M24x2	5490-24	4990-24	5492-24	4992-24					3769-24
M27x2	5490-27	4990-27	5492-27	4992-27					
M30x2	5490-30	4990-30	5492-30	4992-30					
M33x2	5490-33	4990-33	5492-33	4992-33					
M36x2	5490-36	4990-36	5492-36	4992-36					
M39x2	5490-39	4990-39	5492-39	4992-39					
M36x3	5496-36	4996-36	5497-36	4997-36					
M39x3	5496-39	4996-39	5497-39	4997-39					

- High Spiral Flute - Bottoming (2 Thread Chamfer). Have spiral flute for efficiently pulling stringy chips out of deep or blind holes in soft materials.

**ROUGHING TAPS.** Are available for difficult tapping operations where it is desirable to reduce the load on the finishing tap. Available in sizes 12mm thru 24mm.

## SPECIAL STI TAPS

Taps made to different limits, configurations, or to cut difficult materials, or for very high production are available upon request. The following data should be provided at the time of ordering:

- Thread size
- Class of fit. **Example: 4H5H, 5H, Special Size to Special Tolerance.**
- Material to be cut, and its hardness.

- Hole configuration. **Example: Thru or Blind including length of drilled and tapped hole.**
- Type tap. **Example: Plug or Bottoming Straight Flute, Spiral Point, Spiral Flute.**
- Special features. **Example: Length, Shank Diameter, Chamfer Length, Tap Material.**
- Special coating of tap.

**TABLE XII– HELI-COIL STI TAP DIMENSIONS**

\* Tap dimensions in millimeters.

Nominal Thread Size	OVERALL LENGTH		THREAD LENGTH		SHANK DIAMETER		SIZE OF SQUARE		SQUARE LENGTH	
	mm	Tolerance ±	mm	Tolerance ±	Max.	Tolerance — only	mm	Tolerance — only	mm	Tolerance ±
<b>METRIC COARSE</b>										
M2x0.4	46.04	0.79	12.70	1.19	.141	0.04	2.80	0.10	4.77	0.79
M2.2X0.45	47.62	0.79	14.29	1.19	3.58	0.04	2.79	0.10	4.76	0.79
M2.5x0.45	49.21	0.79	15.88	1.19	3.58	0.04	2.79	0.10	4.76	0.79
M3x0.5	50.80	0.79	17.46	1.19	3.58	0.04	2.79	0.10	4.76	0.79
M3.5x0.6	53.98	0.79	19.05	1.19	4.27	0.04	3.33	0.10	6.35	0.79
M4x0.7	60.32	0.79	22.22	1.19	4.93	0.04	3.86	0.10	6.35	0.79
M5x0.8	63.50	0.79	25.40	1.59	6.48	0.04	4.85	0.10	7.94	0.79
M6x1	69.06	0.79	28.58	1.59	8.08	0.04	6.04	0.10	9.52	0.79
M7x1	74.61	0.79	31.75	1.59	9.68	0.04	7.26	0.10	11.11	0.79
M8x1.25	74.61	0.79	31.75	1.59	9.68	0.04	7.26	0.10	11.11	0.79
M10x1.5	85.72	0.79	42.07	1.59	9.32	0.04	6.98	0.10	11.11	0.79
M12x1.75	91.28	0.79	42.07	2.38	10.90	0.04	8.18	0.15	12.70	0.79
M14x2	102.39	0.79	46.04	2.38	13.77	0.05	10.31	0.15	15.88	0.79
M16x2	107.95	0.79	50.80	2.38	14.99	0.05	11.23	0.15	17.46	0.79
M18x2.5	119.06	0.79	56.36	2.38	17.70	0.05	13.28	0.15	19.05	0.79
M20x2.5	124.62	0.79	56.36	2.38	19.30	0.05	14.48	0.15	19.05	0.79
M22X2.5	130.18	0.79	63.50	2.38	20.32	0.05	15.24	0.15	20.64	0.79
M24X3	138.11	1.59	65.09	2.38	22.76	0.05	17.07	0.20	22.22	1.59
M27X3	146.05	1.59	65.09	2.38	25.98	0.05	19.46	0.20	25.40	1.59
M30X3.5	153.99	1.59	76.20	2.38	28.14	0.05	21.11	0.20	26.99	1.59
M33X3.5	161.92	1.59	76.20	2.38	31.32	0.05	23.50	0.20	28.58	1.59
M36X4	177.80	1.59	80.96	3.18	36.32	0.08	27.23	0.20	31.75	1.59
M39X4	177.80	1.59	80.96	3.18	36.32	0.08	27.23	0.20	31.75	1.59
<b>METRIC FINE</b>										
M8X1	74.61	0.79	31.75	1.59	9.68	0.04	7.26	0.10	11.11	0.79
M10X1	80.71	0.79	36.51	1.59	8.20	0.04	6.15	0.10	10.32	0.79
M10X1.25	85.72	0.79	42.07	1.59	9.32	0.04	6.98	0.10	11.11	0.79
M12X1.25	91.28	0.79	42.07	2.38	10.90	0.04	8.18	0.15	12.70	0.79
M12X1.5	91.28	0.79	42.07	2.38	10.90	0.04	8.18	0.15	12.70	0.79
M14X1.5	96.84	0.79	46.04	2.38	12.19	0.04	9.14	0.15	14.29	0.79
M16X1.5	107.95	0.79	50.80	2.38	14.99	0.05	11.23	0.15	17.46	0.79
M18X1.5	113.51	0.79	50.80	2.38	16.56	0.05	12.42	0.15	17.46	0.79
M20X1.5	119.06	0.79	56.36	2.38	17.70	0.05	13.28	0.15	19.05	0.79
M22X1.5	130.18	0.79	63.50	2.38	20.32	0.05	15.24	0.15	20.64	0.79
M18X2	113.51	0.79	50.80	2.38	16.56	0.05	12.42	0.15	17.46	0.79
M20X2	124.62	0.79	56.36	2.38	19.30	0.05	14.48	0.15	19.05	0.79
M22X2	130.18	0.79	63.50	2.38	20.32	0.05	15.24	0.15	20.64	0.79
M24X2	130.18	1.59	63.50	2.38	22.76	0.05	17.07	0.20	22.22	1.59
M27X2	138.11	1.59	65.09	2.38	25.93	0.05	19.46	0.20	25.40	1.59
M30X2	146.05	1.59	65.09	2.38	28.14	0.05	21.11	0.20	26.99	1.59
M33X2	153.99	1.59	76.20	2.38	31.32	0.05	23.50	0.20	28.58	1.59
M36X2	169.86	1.59	80.96	3.18	33.15	0.08	24.87	0.20	28.58	1.59
M39X2	177.80	1.59	80.96	3.18	36.32	0.08	27.23	0.20	31.75	1.59
M36X3	169.86	1.59	80.96	3.18	33.15	0.08	24.87	0.20	28.58	1.59
M39X3	177.80	1.59	80.96	3.18	36.32	0.08	27.23	0.20	31.75	1.59

# Heli-Coil® gages – inch

Accuracy of the finished thread when the insert is installed is dependent upon the accuracy of the tapped hole. If the finished tapped hole gages satisfactorily, the installed insert will be within the thread tolerance. **It is not necessary to gage the installed insert.** After the insert is installed, the **GO** thread plug gage may not enter freely; however, the insert will always seat itself when the bolt or screw is installed and tightened. (Reference NASM33537).

Gage handles and all gage nibs are marked with the extreme product limits for the particular size and class of fit. (See Pages 20 & 21, Tables VII & VIII, Pitch Diameter Limits).

When gaging tapped holes which have been thoroughly cleaned or which have a protective finish applied, the gage should always be lubricated with light oil.

**HI** nib may enter provided a definite drag results on or before 3rd turn from entry – Ref. FED-STD-H28, Screw thread Standards for Federal Services.

Heli-Coil STI Thread Plug Gages for checking the tapped hole are listed in the table at right.

Working gages provide a guaranteed minimum wear allowance on the pitch diameter of the **GO** members of two ten thousandths of an inch (.0002). These gages are recommended for production in sizes 1/2 inch and smaller.

Reference gages have pitch diameters on or close to minimum (basic size). They are essentially laboratory or master gages and should be used in case of conflict between two working gages. Conflict can occur when one of the gages has experienced more use and wear.

Nominal Thread Size	WORKING GAGES		REFERENCE GAGES	
	Suggested for Longer Wear Life		Suggested as Master Gages	
	3B	2B	3B	2B
<b>UNIFIED COARSE THREAD (UNC)</b>				
1 (.073)-64	3688-01	1442-01	1688-01	1440-01
2 (.086)-56	3688-02	1442-02	1688-02	1440-02
3 (.099)-48	3688-03	1442-03	1688-03	1440-03
4 (.112)-40	3688-04	1442-04	1688-04	1440-04
5 (.125)-40	3688-05	1442-05	1688-05	1440-05
6 (.138)-32	3688-06	1442-06	1688-06	1440-06
8 (.164)-32	3688-2	1442-2	1688-2	1440-2
10 (.190)-24	3688-3	1442-3	1688-3	1440-3
12 (.216)-24	3688-1	1442-1	1688-1	1440-1
1/4 (.2500)-20	3688-4	1442-4	1688-4	1440-4
5/16 (.3125)-18	3688-5	1442-5	1688-5	1440-5
3/8 (.3750)-16	3688-6	1442-6	1688-6	1440-6
7/16 (.4375)-14	3688-7	1442-7	1688-7	1440-7
1/2 (.5000)-13	3688-8	1442-8	1688-8	1440-8
9/16 (.5625)-12			1688-9	1440-9
5/8 (.6250)-11			1688-10	1440-10
3/4 (.7500)-10			1688-12	1440-12
7/8 (.8750)-9			1688-14	1440-14
1 (1.000)-8			1688-16	1440-16
1-1/8 (1.1250)-7			1688-18	1440-18
1-1/4 (1.2500)-7			1688-20	1440-20
1-3/8 (1.3750)-6			1688-22	1440-22
1-1/2 (1.5000)-6			1688-24	1440-24
<b>UNIFIED FINE THREAD (UNF)</b>				
2 (.086)-64	3694-02	1443-02	1694-02	1441-02
3 (.099)-56	3694-03	1443-03	1694-03	1441-03
4 (.112)-48	3694-04	1443-04	1694-04	1441-04
6 (.138)-40	3694-06	1443-06	1694-06	1441-06
8 (.164)-36	3694-2	1443-2	1694-2	1441-2
10 (.190)-32	3694-3	1443-3	1694-3	1441-3
1/4 (.2500)-28	3694-4	1443-4	1694-4	1441-4
5/16 (.3125)-24	3694-5	1443-5	1694-5	1441-5
3/8 (.3750)-24	3694-6	1443-6	1694-6	1441-6
7/16 (.4375)-20	3694-7	1443-7	1694-7	1441-7
1/2 (.5000)-20	3694-8	1443-8	1694-8	1441-8
9/16 (.5625)-18			1694-9	1441-9
5/8 (.6250)-18			1694-10	1441-10
3/4 (.7500)-16			1694-12	1441-12
7/8 (.8750)-14			1694-14	1441-14
1 (1.0000)-14			1694-16	1441-16
1 (1.0000)-12			1694-161	1441-161
1-1/8 (1.1250)-12			1694-18	1441-18
1-1/4 (1.2500)-12			1694-20	1441-20
1-3/8 (1.3750)-12			1694-22	1441-22
1-1/2 (1.5000)-12			1694-24	1441-24

## HELI-COIL STI GAGE WITH GO & HI MEMBERS



Heli-Coil STI Thread Plug Gages (metric) for checking the tapped hole are listed below.

The complete gage consists of the **GO** thread plug gage, the **HI** thread plug gage and the appropriately marked gage handle.

Accuracy of the finished thread, when the insert is installed, is dependent upon the accuracy of the tapped hole. If the finished tapped hole gages satisfactorily, the installed insert will be within the thread tolerance. It is, therefore, **not necessary to gage the installed insert.**

After the insert is installed, the **GO** thread plug gage may not enter freely; however, the insert will always seat itself when the bolt or screw is installed and tightened. *(Reference MA1567)*

When gaging tapped holes which have been thoroughly cleaned or which have a protective finish applied, the gage should always be lubricated with light oil.

The **HI** thread plug gage may enter provided that a definite drag results on or before the second turn of entry. *(Reference ANSI B1.16)*

Nominal Thread Size	Complete Gage	
	4H5H	5H
<b>METRIC COARSE</b>		
M2x0.4	4624-2	1324-2
M2.2X0.45	4624-2.2	1324-2.2
M2.5x0.45	4624-2.5	1324-2.5
M3x0.5	4624-3	1324-3
M3.5x0.6	4624-3.5	1324-3.5
M4x0.7	4624-4	1324-4
M5x0.8	4624-5	1324-5
M6x1	4624-6	1324-6
M7x1	4624-7	1324-7
M8x1.25	4624-8	1324-8
M10x1.5	4624-10	1324-10
M12x1.75	4624-12	1324-12
M14x2	4624-14	1324-14
M16x2	4624-16	1324-16
M18x2.5	4624-18	1324-18
M20x2.5	4624-20	1324-20
M22X2.5	4624-22	1324-22
M24X3	4624-24	1324-24
M27X3	4624-27	1324-27
M30X3.5	4624-30	1324-30
M33X3.5	4624-33	1324-33
M36X4	4624-36	1324-36
M39X4	4624-39	1324-39
<b>METRIC FINE</b>		
M8X1	5416-8	4916-8
M10X1	5416-10	4916-10
M10X1.25	5424-10	4924-10
M12X1.25	5424-12	4924-12
M12X1.5	5480-12	4980-12
M14X1.5	5480-14	4980-14
M16X1.5	5480-16	4980-16
M18X1.5	5480-18	4980-18
M20X1.5	5480-20	4980-20
M22X1.5	5480-22	4980-22
M18X2	5418-18	4918-18
M20X2	5418-20	4918-20
M22X2	5418-22	4918-22
M24X2	5418-24	4918-24
M27X2	5418-27	4918-27
M30X2	5418-30	4918-30
M33X2	5418-33	4918-33
M36X2	5421-36	4921-36
M39X3	5421-39	4921-39



## Types of Tools

The various tools to install Heli-Coil inserts are presented on the following pages.

For production runs, prototype work, salvage, and repair, hand inserting tools are available. For high volume production, power inserting tools are also available. Both types of tools are dimensioned (pages 29 and 31) to aid determination of accessibility to the tapped hole.

Both hand and power inserting tools feature a threaded mandrel which engages the insert and provides a positive lead to guide the insert into the tapped hole easily and quickly.

Power inserting tools consist of an air motor, adapter and front end assembly. The front end assembly consists of a prewinder, mandrel and 3 spacers (1 for each length of insert to be installed). The versatility and adaptability of Heli-Coil power inserting tools is shown on page 32. The tool can be hand held, vertically or horizontally mounted, and adapted to both semi-automatic and fully automatic installation stations. Heli-Coil power inserting tools can be adapted to assembly stations, rotary tables and transfer lines.

## Tool Service

All Heli-Coil tooling is backed by our extensive expertise and experience in virtually any application. Of course, all tools are fully warranted. In addition, our Application Engineering Department is always available to assist in installation techniques, special tooling (longer or shorter length tools, etc.) and tool service. For very high production, Heli-Coil will provide for the successful development of automated installation systems.

## Hand Inserting Tools



**TYPE I Threaded Mandrel**



**TYPE II Prewinder**



**TYPE III Threaded Mandrel**

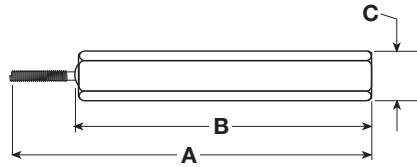


**TYPE IV Non-Captive Prewinder**

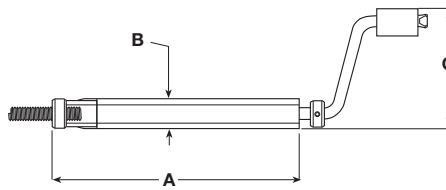
Pictured above are the various designs of Heli-Coil hand inserting tools. Generally, finer pitch inserts are proportionately larger in the free state than coarse pitch inserts and thus have to be “pre-wound” to a smaller diameter for installation. Large coarse pitch inserts (and #2-56, #3-48 and M2.2 inserts) need only a threaded mandrel tool for installation.

# Heli-Coil® hand inserting tools

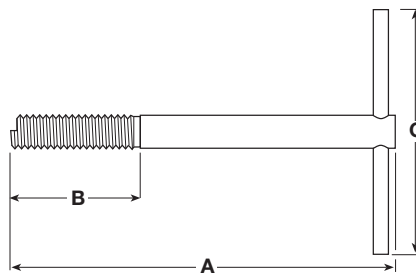
Nominal Thread Size	Hand Inserting Tools 3 Dia. Lengths thru 7/8 2 Dia. Lengths 1" & Up	Tool Type
<b>UNIFIED COARSE (UNC)</b>		
1 (.073)-64	7551-01	IV
2 (.086)-56	551-02	I
3 (.099)-48	551-03	I
4 (.112)-40*	7551-04	II
5 (.125)-40	7551-05	II
6 (.138)-32	7551-06	II
8 (.164)-32*	7551-2	II
10 (.190)-24*	7551-3 (M)	II
12 (.216)-24	7551-1 (M)	II
1/4 (.2500)-20	7551-4 (M)	II
5/16 (.3125)-18	7551-5 (M)	II
3/8 (.3750)-16	7551-6 (M)	II
7/16 (.4375)-14	7551-7 (M)	II
1/2 (.5000)-13	7551-8 (M)	II
9/16 (.5625)-12	3724-9	III
5/8 (.6250)-11	3724-10	III
3/4 (.7500)-10	3724-12	III
7/8 (.8750)-9	3724-14	III
1 (1.0000)-8	3724-16	III
1-1/8 (1.1250)-7	3724-18	III
1-1/4 (1.2500)-7	3724-20	III
1-3/8 (1.3750)-6	3724-22	III
1-1/2 (1.5000)-6	3724-24	III
<b>UNIFIED FINE (UNF)</b>		
2 (.086)-64	7552-02	IV
3 (.099)-56	7552-03	II
4 (.112)-48	7552-04	II
6 (.138)-40	7552-06	II
8 (.164)-36	7552-2	II
10 (.190)-32	7552-3 (M)	II
1/4 (.2500)-28	7552-4 (M)	II
5/16 (.3125)-24	7552-5 (M)	II
3/8 (.3750)-24	7552-6 (M)	II
7/16 (.4375)-20	7552-7 (M)	II
1/2 (.5000)-20	7552-8 (M)	II
9/16 (.5625)-18	535-9	IV
5/8 (.6250)-18	535-10	IV
3/4 (.7500)-16	535-12	IV
7/8 (.8750)-14	535-14	IV
1 (1.0000)-14	535-16	IV
1 (1.0000)-12	535-161	IV
1-1/8 (1.1250)-12	535-18	IV
1-1/4 (1.2500)-12	535-20	IV
1-3/8 (1.3750)-12	535-22	IV
1-1/2 (1.5000)-12	535-24	IV



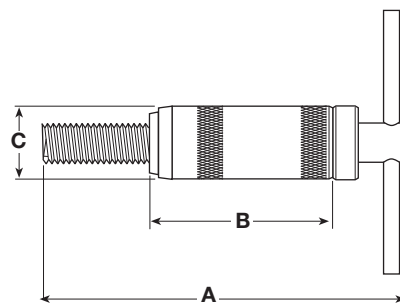
**TYPE I Threaded Mandrel**



**TYPE II Prewinder\***



**TYPE III Threaded Mandrel**



**TYPE IV Non-Captive Prewinder**

Nominal Thread Size	Hand Inserting Tools 3 Dia. Lengths thru M22 2 Dia. Lengths M24 & Up	Tool Type
<b>METRIC COARSE</b>		
M2X0.4	7751-2	IV
M2.2x0.45	7751-2.2	I
M2.5x0.45*	7751-2.5	II
M3x0.5*	7751-3	II
M3.5x0.6	7751-3.5	II
M4x0.7	7751-4	II
M5x0.8*	7751-5 (M)	II
M6x1	7751-6 (M)	II
M7x1	7751-7 (M)	II
M8x1.25	7751-8 (M)	II
M10x1.5	7751-10 (M)	II
M12x1.75	7751-12 (M)	II
M14x2	7751-14	IV
M16x2	7751-16	IV
M18x2.5	7751-18	III
M20x2.5	7751-20	IV
M22X2.5	7751-22	III
M24X3	7751-24	IV
M27X3	7751-27	III
M30X3.5	7751-30	III
M33X3.5	7751-33	III
M36X4	7751-36	III
M39X4	7751-39	III
<b>METRIC FINE</b>		
M8X1	7755-8	II
M10X1	7755-10	II
M10X1.25	7756-10	II
M12X1.25	7756-12	II
M12X1.5	7753-12	II
M14X1.5	7753-14	IV
M16X1.5	7753-16	IV
M18X1.5	7753-18	IV
M20X1.5	7753-20	IV
M22X1.5	7753-22	IV
M18X2	7754-18	IV
M20X2	7754-20	IV
M22X2	7754-22	IV
M24X2	7754-24	IV
M27X2	7754-27	IV
M30X2	7754-30	IV
M33X2	7754-33	IV
M36X2	7754-36	IV
M39X2	7754-39	IV
M36x3	7752-36	IV
M39x3	7752-39	IV

\* Special tools required to install Phosphor Bronze and Inconel X-750 inserts in these sizes. To order add "-9" to the part number shown.  
Note: Inserts marked with an "(M)" are available with a steel prewinder.  
For this option, specify when ordering (e.g., 7551-3M).

## Hand Inserting Tool Dimensions

INCH	METRIC	A	B	C	INCH	METRIC	A	B	C	INCH	METRIC	A	B	C
<b>TYPE I - Coarse &amp; Fine</b>					<b>TYPE II - Coarse &amp; Fine (continued)</b>					<b>TYPE IV - Coarse &amp; Fine*</b>				
2-56	M2.2	2-7/16	2	5/16	7/16"	M10 & 11	5-1/4	25/32	3-23/32	9/16"	M14*	5-3/8	2-7/8	1-1/8
3-56	-	6	3	5/8	1/2"	M12	5-1/2	7/8	3-23/32	5/8"	M16*	5-3/8	2-7/8	1-1/8
<b>TYPE II - Coarse &amp; Fine</b>					<b>TYPE III - Coarse</b>									
4	M2.5	4-5/8	3/8	2-9/32	9/16"	-	4-7/8	1-13/16	4	3/4"	M18	6	2-7/8	1-1/2
5	M3	4-5/8	3/8	2-9/32	5/8"	-	4-7/8	2	4	1-14"	M22	5-7/8	2-7/8	1-5/8
6	M3.5	4-5/8	3/8	2-9/32	3/4"	M18	4-7/8	2-3/8	4	1-12"	M24	5-7/8	2-7/8	1-5/8
8	M4	4-5/8	3/8	2-9/32	7/8"	M20	4-7/8	2-3/4	4-1/2	1-1/8"	M30	6-5/16	3-1/16	2
10	M5	4-5/8	15/32	2-9/32	1"	M24	4-7/8	2-1/8	4-1/2	1-1/4"	M33	6-13/16	3-5/16	2
12	-	4-5/8	33/64	2-17/32	1-1/8"	M30	6-3/4	2-1/2	6	1-3/8"	M36	7-5/16	3-9/16	2-1/4
1/4"	M6	4-5/8	33/64	2-17/32	1-1/4"	M33	6-3/4	2-3/4	6	1-1/2"	M39	7-13/16	3-13/16	2-1/4
5/16"	-	4-5/8	5/8	3-23/32	1-3/8"	M36	6-3/4	3	6	1-64	M2	2-5/8	3/4	7/16
3/8"	M7 & 8	5	45/64	3-23/32	1-1/2"	M39	6-3/4	3-1/4	6					

\* M14 & M16 Coarse are Type IV Tools. For metric sizes not shown, see next largest size.

# Heli-Coil® inch power inserting tools

Heli-Coil power tools are available in UNC and UNF sizes #2 thru 1/2"\* for rapid installation of Heli-Coil inserts. Power tools consist of a Front End Assembly, an Adapter

and a reversible Air Motor. All three components are ordered separately. A Front End Assembly consists of a prewinder, mandrel and spacers. Select the adapter that corresponds

with the insert size being used. Power tools for strip feed inserts are available in sizes #2 through 5/16".

	Nominal Thread Size	FRONT END ASSEMBLY		PREWINDERS		MANDRELS	SPACERS		
		P/N for Bulk Inserts (2 dia. max.)	P/N for Strip Feed Inserts	P/N for Bulk Inserts	P/N for Strip Feed Inserts		1 Dia.	1-1/2 Dia.	2 Dia.
<b>INCH COARSE THREAD (UNC)</b>									
Small Adapter	2 (.086)-56	—	8551-02-15	—	8557-02-15	8553-02	8559-02	8560-02	8561-02
	4 (.112)-40	8551-04	8551-04-15	8557-04	8557-04-15	8553-04	8559-04	8560-04	8561
	5 (.125)-40	8551-05	—	8557-05	—	8553-05	8559-05	8560-05	8561
	6 (.138)-32	8551-06	8551-06-15	8557-06	8557-06-15	8553-06	8559-06	8560-06	8561
	8 (.164)-32	8551-2	8551-2-15	8557-2	8557-2-15	8553-2	8559-2	8560-2	8561
	10 (.190)-24	8551-3	8551-3-15	8557-3	8557-3-15	8553-3	8559-3	8560-3	8561
	1/4 (.2500)-20	8551-4	8551-4-15	8557-4	8557-4-15	8553-4	8559-4	8560-4	8561
Large Adapter	5/16 (.3125)-18	8251-5	8251-5-15	8257-5	8257-5-15	8253-5	8259-5-10	8259-5-15	
	3/8 (.3750)-16	8251-6	—	8257-6	—	8253-6	8259-6-10	8259-6-15	NONE REQ'D
	7/16 (.4375)-14	8251-7	—	8257-7	—	8253-7	8259-7-10	8259-7-15	
	1/2 (.5000)-13	8251-8	—	8257-8	—	8253-8	8259-8-10	8259-8-15	
<b>INCH FINE THREAD (UNF)</b>									
Small Adapter	6 (.138)-40	8552-06	—	8558-06	—	8554-06	8559-06	8560-06	8561
	10 (.190)-32	8552-3	8552-3-15	8558-3	8558-3-15	8554-3	8559-3	8560-3	8561
	1/4 (.2500)-28	8552-4	8552-4-15	8558-4	8558-4-15	8554-4	8559-4	8560-4	8561
Large Adapter	5/16 (.3125)-24	8252-5	8252-5-15	8258-5	8258-5-15	8254-5	8259-5-10	8259-5-15	
	3/8 (.3750)-24	8252-6	—	8358-6	—	8254-6	8259-6-10	8259-6-15	NONE REQ'D
	7/16 (.4375)-20	8252-7	—	8258-7	—	8254-7	8259-7-10	8259-7-15	
	1/2 (.5000)-20	8252-8	—	8258-8	—	8254-8	8259-8-10	8259-8-15	

\*Tools for larger sizes or special applications are available upon request.

## Complete Power Tool Assembly



Power Tool Holder, Part No. 23537, can be used with or without Strip Feed inserts.

Note: Recommended for use with 2-56, M2.2x0.45 & M2.5x0.45 power tool.

# Heli-Coil® metric power inserting tools

Heli-Coil metric power inserting tools are available in coarse and fine sizes up to 12mm\* for rapid installation of standard and screw-lock inserts, reducing assembly costs substantially. Strip feed power tools are available in sizes up to 7mm.

They speed up assembly, eliminate waste and permit an accurate count.

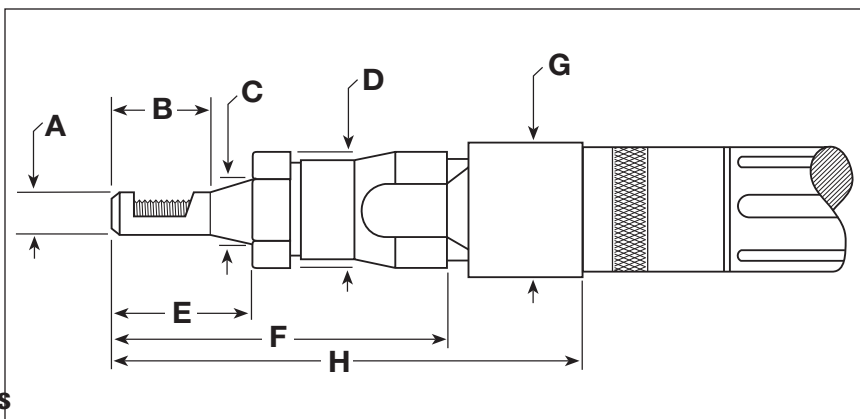
Power tools consist of a **Front End Assembly**, an **Adapter** and a reversible **Air Motor**. All three components are ordered individually. A front end assembly consists of a

prewinder, mandrel and spacers. Select an Adapter that is compatible with the Air Motor to be used, and for the size range up thru 6mm or the size range 7mm thru 12mm.

	Nominal Thread Size	FRONT END ASSEMBLY		PREWINDERS		MANDRELS	SPACERS		
		P/N for Bulk Inserts (2 dia. max.)	P/N for Strip Feed Inserts	P/N for Bulk Inserts	P/N for Strip Feed Inserts		1 Dia.	1-1/2 Dia.	2 Dia.
<b>METRIC COARSE</b>									
Small Adapter	M2.2x0.45	–	8751-2.2-15	–	8769-2.2-15	8757-2.2	8775-2.2	8776-2.2	8777-2.2
	M2.5x0.45	8751-2.5	8751-2.5-15	8769-2.5	8769-2.5-15	8757-2.5	8775-2.5	8776-2.5	8777
	M3x0.5	8751-3	8751-3-15	8769-3	8769-3-15	8757-3	8775-3	8776-3	8777
	M3.5x0.6	8751-3.5	8751-3.5-15	8769-3.5	8769-3.5-15	8757-3.5	8775-3.5	8776-3.5	8777
	M4x0.7	8751-4	8751-4-15	8769-4	8769-4-15	8757-4	8775-4	8776-4	8777
	M5x0.8	8751-5	8751-5-15	8769-5	8769-5-15	8757-5	8775-5	8776-5	8777
Large Adapter	M6x1	8751-6	8751-6-15	8769-6	8769-6-15	8757-6	8775-6	8776-6	8777
	M7x1	8751-7	8751-7-15	8769-7	8769-7-15	8757-7	8777-7-10	8777-7-15	
	M8x1.25	8751-8	–	8769-8	–	8757-8	8777-8-10	8777-8-15	NONE REQ'D
	M10x1.5	8751-10	–	8769-10	–	8757-10	8777-10-10	8777-10-15	
	M12x1.75	8751-12	–	8769-12	–	8757-12	8777-12-10	8777-12-15	
<b>METRIC FINE</b>									
Large Adapter	M8x1	8755-8	–	8770-8	–	8764-8	8777-8-10	8777-8-15	NONE REQ'D
	M10x1	8755-10	–	8770-10	–	8764-10	8777-10-10	8777-10-15	
	M10x1.25	8756-10	–	8758-10	–	8759-10	8777-10-10	8777-10-15	
	M12x1.25	8756-12	–	8758-12	–	8759-12	8777-12-10	8777-12-15	
	M12x1.5	8753-12	–	8773-12	–	8774-12	8777-12-10	8777-12-15	

\*Tools for larger sizes or special applications are available upon request.

For evaluating space required for installing Heli-Coil inserts with standard manual, pneumatic and electronic inserting tools and tang break-off tools, the diagrams on pages 29 & 31 give dimensions of standard Heli-Coil tooling.



## Power Inserting Tool Dimensions

SIZE		A	B	A	B	C	D	E	F	G	H
INCH	METRIC	FOR BULK INSERTS		FOR STRIP FEED INSERTS							
2	M2.2	–	–	5/16	7/16	23/32	1-1/8	1-3/8	3-3/16	1-1/4	4-7/16
4	M2.5	1/4	9/16	3/8	15/16	23/32	1-1/8	1-3/8	3-3/16	1-1/4	4-7/16
5	M3	9/32	9/16	3/8	15/16	23/32	1-1/8	1-3/8	3-3/16	1-1/4	4-7/16
6	M3.5	5/16	9/16	1/2	15/16	23/32	1-1/8	1-3/8	3-3/16	1-1/4	4-7/16
8	M4	11/32	9/16	1/2	15/16	23/32	1-1/8	1-3/8	3-3/16	1-1/4	4-7/16
10	M5	3/8	29/32	1/2	15/16	23/32	1-1/8	1-3/8	3-3/16	1-1/4	4-7/16
1/4"	M6	27/64	29/32	5/8	1-3/8	23/32	1-1/8	1-3/8	3-3/16	1-1/4	4-7/16
5/16"	M7 & M8	9/16	1-1/8	11/16	1-1/8	1"	1-9/16	1-3/8	4-7/16	1-1/4	5-3/4
3/8"	–	11/16	1-11/32	–	–	1"	1-9/16	1-7/8	4-3/4	1-1/4	6-1/32
7/16"	M10	3/4	1-17/32	–	–	1"	1-9/16	2-1/4	5-1/8	1-1/4	6-13/32
1/2"	M12	13/16	1-25/32	–	–	1"	1-9/16	1-1/2	5-13/32	1-1/4	6-11/16



# Heli-Coil® power inserting tools

## Electronic Power Inserting Tool

Heli-Coil offers an electronic power tool where electric power is preferred over air. The slender configuration of the mandrels allows them to reach into constricted areas. Electric power meets the requirements of clean room operations. Operators prefer electric power because it is quieter. The electronic tool is lighter to minimize operator fatigue. Mandrel assemblies are available to install the sizes of Heli-Coil bulk loaded inserts listed below.

*Application Note: Variations in Mandrel Assembly dimensions and threads are available on special order to meet individual applications.*



Power Supply  
P/N 8050-50

Mandrel  
(see table)

Mandrel Driver  
P/N 8050-400C

### Electronic Tool Mandrel Assembly

Insert Thread Size (UNC)	Mandrel Assembly (for bulk inserts)
2(.086)-56	8051-02
4(.112)-40	8051-04
6(.138)-32	8051-06
8(.164)-32	8051-2
10(.190)-24	8051-3
10(.190)-32	10089-3



## Pneumatic Power Tool Installation Kit

This Heli-Coil power tool installation kit (8522) contains an Air Motor (8510-1), adapter, tools, a filter-regulator-lubricator, oil, two quick disconnect fittings, and wrenches. All are packed in a portable molded box with easy-to-follow operating instructions. Front End Assemblies may be ordered separately to fit the sizes of Heli-Coil inserts to be installed.

Power Tools Kit Types	Kit Part#	Small Adapter	Large Adapter
Small Adapter Set	8522	✓	
Large Adapter Set	8521		✓
CombinationSet	8520	✓	✓

## Cordless Electric Tool

The Heli-Coil Cordless Tool is a complete kit (7200) that includes a driver, 2 batteries (7200-20), 15 minute charger and mandrel chuck all in a durable metal box. The cordless tool is portable, lightweight, has adjustable torque and uses standard Heli-Coil electronic tool installation mandrels for quick setup.



P/N 7200

## Power Tool Holder

The Power Tool Holder 23537 is mounted on a bench and the appropriate air motor is attached to a spring loaded air tube at the end of a movable arm. A mounting arm is also provided for attaching reels of strip-feed inserts.

This power tool holder configuration ensures accurate vertical (square to work surface) installations of Heli-Coil inserts in relatively large parts. The tool holder is capable of installing inserts within a radius of 23.5 inches as well as on planes differing by 3.5 inches. Example: Box shape configurations.



**NOTE:** This tool holder is recommended for use with the **2-56**, **M2.2x0.45** and **M2.5x0.45** air tools. The tool holder also may be used with the Heli-Coil Electronic Inserting Tool.

## Heli-Coil Tang Break-Off Tools

The driving tangs of Heli-Coil inserts must be removed to eliminate their interference with the end of the assembled bolt. Heli-Coil tang break-off tools are available for use with inserts through 1/2 inch and 12mm metric nominal diameter. Their operation is automatic, having a spring loaded, easily triggered punch that strikes a sharp, uniform blow against the tang of the installed insert. The tool can be operated with one hand.



Nominal Thread Size	Tool Part No.	Replacement Punch Part No.
<b>UNIFIED COARSE THREAD (UNC)</b>		
1 (.073)-64	3695-01	3697-01
2 (.086)-56	3695-02	3697-02
3 (.099)-48	3695-02	3697-02
4 (.112)-40	3695-04	3697-04
5 (.125)-40	3695-04	3697-04
6 (.138)-32	3695-06	3697-06
8 (.164)-32	3695-2	3697-2
10 (.190)-24	3695-3	3697-3
12 (.216)-24	3695-3	3697-3
1/4 (.2500)-20	3695-4	3697-4
5/16 (.3125)-18	3695-5	3643-5
3/8 (.3750)-16	3695-6	3643-6
7/16 (.4375)-14	3695-7	3643-7
1/2 (.5000)-13	3695-8	3643-8
<b>UNIFIED FINE THREAD (UNF)</b>		
2 (.086)-64	3695-02	3697-02
3 (.099)-56	3695-02	3697-02
4 (.112)-48	3695-04	3697-04
6 (.138)-40	3695-06	3697-06
8 (.164)-36	3695-2	3697-2
10 (.190)-32	3695-3	3697-3
1/4 (.2500)-28	3695-4	3697-4
5/16 (.3125)-24	3692-5	3645-5
3/8 (.3750)-24	3692-6	3645-6
7/16 (.4375)-20	3692-7	3645-7
1/2 (.5000)-20	3692-8	3645-8

Nominal Thread Size	Tool Part No.	Replacement Punch Part No.
<b>METRIC COARSE</b>		
M2x0.4	4238-2	3697-01
M2.2x0.45	4238-2.2	3697-02
M2.5x0.45	4238-2.2	3697-02
M3x0.5	4238-3	3697-04
M3.5x0.6	4238-3	3697-04
M4x0.7	4238-4	3697-2
M5x0.8	4238-5	3697-3
M6x1	4238-6	3697-4
M7x1	4238-7	4436-7
M8x1.25	4238-8	3643-5
M10x1.25	4238-10	4436-10
M12x1.75	4238-12	4436-12
<b>METRIC FINE</b>		
M8x1	4238-8	3643-5
M10x1	4238-10	4436-10
M10x1.25	4238-10	4436-10
M12x1.25	4238-12	4436-12
M12x1.5	4238-12	4436-12

**Note:** Tang break-off tools will break-off tangs thru 2 diameter lengths.  
 For 2 1/2 - 3 diameter lengths, add "-30" to the standard part number (eg, 3695-01-30).  
 For sizes larger than 1/2" or 12mm, use long nose pliers. Bend tang up and down to snap off at notch.

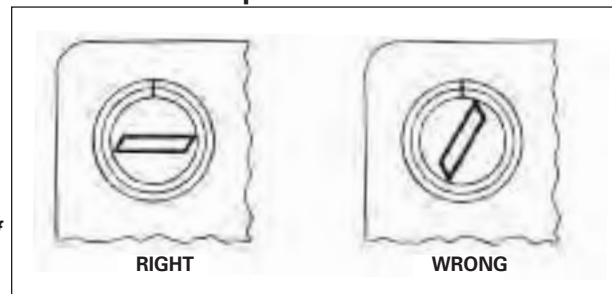
## Heli-Coil Extracting Tools

Occasionally Heli-Coil inserts must be removed. Inserts may be removed manually with little effort. This is done by inserting the blade of the extracting tool into the Heli-Coil insert so that the V section of the blade is toward the top end of the insert. Strike the head of the tool with a light blow. Maintaining a steady pressure of blade against insert, turn the extracting tool counterclockwise until the insert is removed.



Nominal Thread Size		Extracting Tool Part No.
Inch	Metric	
1	M2	1227-01
2	M2.2	1227-02
3 thru 8	M2.5 thru M4	1227-06
10 thru 3/8"	M5 thru M10	1227-6
7/16" thru 1"	M11 thru M24	1227-16
1-1/8" thru 1-1/2"	M27 thru M39	1227-24

**Top View Shown**



*Right & wrong blade positions of insert extracting tool.*

# Heli-Coil® Tangless® tools

## Installation and Removal Tools

Tangless® inserts may be installed by hand or electronic power tooling with the same mandrel assembly.

Front end assemblies are also available for pneumatic power tooling.

- Tooling utilizes a “blade” that applies torque to a notch in the end of the coil for installation.
- Installation depth can be adjusted easily for virtually any application.
- Driving blades are replaceable and increase the overall life of the tool.



8050-50

Electronic tool & power supply

Strip-feed reels, available in all sizes



Hand installation tool

## Heli-Coil Tangless® Hand Installation Tooling

Nominal Thread Size	Hand Installation Tool		Replacement Installation Blade Kit**		Removal Tool (with handles)	Electronic Driver*
	Crank Style	Gauge Style	Crank Style	Gauge Style		
2-56	17551-02	7571-02	17551-02-5	7571-02-5	7570-02	8050-400C
4-40	17551-04	7571-04	17551-04-5	7571-04-5	7570-04	8050-400C
6-32	17551-06	7571-06	17551-06-5	7571-06-5	7570-06	8050-400C
8-32	17551-2	7571-2	17551-2-5	7571-2-5	7570-2	8050-400C
10-24	17551-3	7571-3	17551-3-5	7571-3-5	7570-3	8050-650C
1/4-20	17551-4	7571-4	17551-4-5	7571-4-5	7570-4	8050-650C
10-32	17552-3	7572-3	17552-3-5	7572-3-5	7570-3	8050-650C
1/4-28	17552-4	N/A	17552-4-5	7572-4-5	7570-4	8050-650C

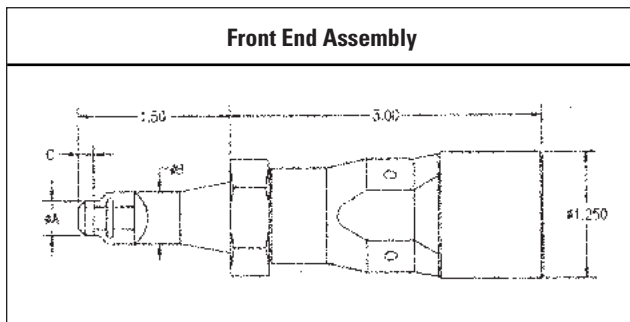
\* An electronic driver requires a power supply, part number 8050-50.

\*\* Includes blade, spring and pin.

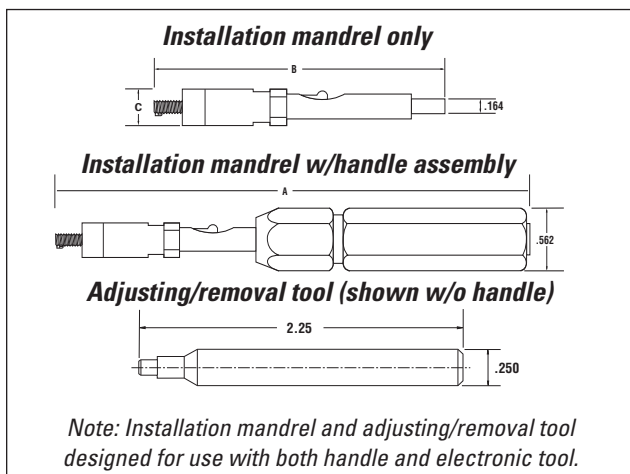
## Heli-Coil Tangless® Power Tooling\*\*\*

Nominal Thread Size	Front End Assembly	Replacement Mandrel Assembly	Replacement Blade
4-40	18551-04-15	18551-04-30	18551-04-2
6-32	18551-06-15	18551-06-30	18551-06-2
8-32	18551-2-15	18551-2-30	18551-2-2
10-24	18551-3-15	18551-3-30	18551-3-2
1/4-20	18551-4-15	18551-4-30	18551-4-2
10-32	18552-3-15	18552-3-30	18552-3-2
1/4-28	18552-4-15	18552-4-30	18552-4-2

\*\*\* For use with Heli-Coil® Pneumatic Installation Tools & Adapters.



Front End Assembly Dimensions			
Nominal	A Nose Diameter	B Body Diameter	C Prewinder Tip Length
2-56	.32	.32	.09
4-40	.25	.40	.13
6-32	.32	.50	.14
8-32	.35	.51	.15
10-24	.38	.51	.19
10-32	.38	.51	.15
1/4-20	.42	.63	.22
1/4-28	.42	.63	.22



Installation Tool Dimensions			
Nominal Thread Size	"A" Overall Length (reference)	"B" Mandrel Length	"C" Spinner Diameter
2-56	5.33	2.80	.240
4-40	5.43	2.90	.240
6-32	5.53	3.00	.360
8-32	5.68	3.15	.360
10-24	5.53	3.00	.370
10-32	5.53	3.00	.370
1/4-20	5.53	3.00	.370
1/4-28	5.53	3.00	.370

# Thread repair kits & master sets

Heli-Coil inserts are available in thread repair kits and sets for repairing tapped holes which have been stripped or damaged due to wear, corrosion and over-torque. They are available in inch, metric, spark plug and pipe thread series.

All kits have a quantity of inserts, the proper size drill, high speed steel Heli-Coil tap and an installation tool. The Professional Kits\* (shown in **bold** type) also includes a tang removal tool and quantities of three lengths of inserts.



Thread Size	Kit P/N	Inserts per Kit
<b>Inch Coarse Thread (UNC)</b>		
4-40	<b>5401-04</b>	36*
5-40	<b>5401-05</b>	36*
6-32	<b>5401-06</b>	36*
8-32	<b>5401-2</b>	36*
10-24	<b>5401-3</b>	36*
12-24	<b>5401-1</b>	36*
1/4-20	<b>5401-4</b>	36*
5/16-18	<b>5401-5</b>	36*
3/8-16	<b>5401-6</b>	18*
7/16-14	<b>5401-7</b>	18*
1/2-13	<b>5401-8</b>	18*
9/16-12	5401-9	6
5/8-11	5401-10	6
3/4-10	5401-12	4
7/8-9	5521-14	6
1-8	5521-16	6
1-1/8-7	5521-18	5
1-1/4-7	5521-20	4
1-3/8-6	5521-22	4
1-1/2-6	5521-24	4
<b>Inch Fine Thread (UNF)</b>		
6-40	<b>5402-06</b>	36*
8-36	<b>5402-2</b>	36*
10-32	<b>5402-3</b>	36*
1/4-28	<b>5402-4</b>	36*
5/16-24	<b>5402-5</b>	36*
3/8-24	<b>5402-6</b>	18*
7/17-20	<b>5402-7</b>	18*
1/2-20	<b>5402-8</b>	18*
9/16-18	5402-9	6
5/8-18	5402-10	6
3/4-16	5402-12	4
7/8-14	5528-14	6
1-14	5528-16	6
1-12	5528-161	6
1-1/8-12	5528-18	5
1-1/4-12	5528-20	4
1-3/8-12	5528-22	4
1-1/2-12	5528-24	4

\* The total quantity of inserts in the Professional Kits represents 3 lengths.

Thread Size	Kit P/N	Inserts per Kit
<b>Metric Coarse</b>		
M3x0.5	<b>5403-3</b>	36*
M3.5x0.6	<b>5403-3.5</b>	36*
M4x0.7	<b>5403-4</b>	18*
M5x0.8	<b>5403-5</b>	18*
M6x1	<b>5403-6</b>	18*
M7x1	<b>5403-7</b>	18*
M8x1.25	<b>5403-8</b>	18*
M9x1.25	5403-9	12
M10x1.5	<b>5403-10</b>	18*
M11x1.5	5403-11	6
M12x1.75	<b>5403-12</b>	18*
M14x2	5403-14	12
M16x2	5403-16	6
M18x2.5	5403-18	6
M20x2.5	5403-20	4
<b>Metric Fine</b>		
M8x1	<b>5404-8</b>	18*
M10x1	<b>5404-10</b>	18*
M10x1.25	<b>5405-10</b>	18*
M12x1.25	<b>5405-12</b>	18*
M12x1.5	<b>5406-12</b>	18*
M14x1.5	5406-14	6
M16x1.5	5406-16	6
M18x1.5	5406-18	6

\* The total quantity of inserts in the Professional Kits represents 3 lengths.

## MASTER THREAD REPAIR SETS

Type	Part No.	Insert sizes included in set
Inch Coarse	4934	1/4-20, 5/16-18, 3/8-16, 7/16-14, 1/2-13, 5/8-11
Inch Fine	4936	10-32, 1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20
Metric	4937-125	M5x0.8, M6x1, M8x1.25, M10x1.25
Metric	4937-150	M5x0.8, M6x1, M8x1.25, M10x1.5

All sets contain a drill, tap, tool and inserts for each size listed above.

## SPARK PLUG SERIES

Thread Size	Part No.	Reach	Inserts Per Kit
10-1.0mm	5523-10	1/2	24
12-1.25mm	5523-12	1/2	12
		3/4	12
		3/8	6
		7/16	6
14-1.25mm	5523-14	1/2	6
		3/4	6
		.472	6
18-1.50mm	5523-18	1/2	24
7/8-18	550	1/2-5/8	10
		Short	6
		Normal	6
		Long	6

## PIPE THREAD SERIES

Thread Size	Part No.	Inserts Per Kit
1/8-27	5407-2	12
1/4-18	5407-4	12
3/8-18	5407-6	10
1/2-14	5407-8	10
3/4-14	5407-12	10
1-11-1/2	5407-16	6



# HeliCoil

*Thread Repair & Thread Protection*



***Screw Thread Inserts, Kits  
& Components for Industrial  
Maintenance, Repair and  
Overhaul***

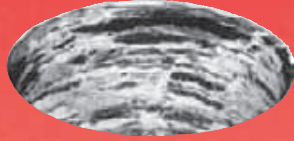
***Bulletin 998***

**CERTIFIED**  
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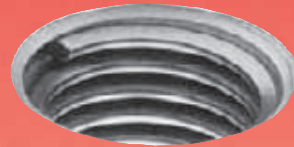
**Emhart<sup>®</sup>  
Teknologies**  
HELI-COIL<sup>®</sup>

# The HELI-COIL Thread Repair System

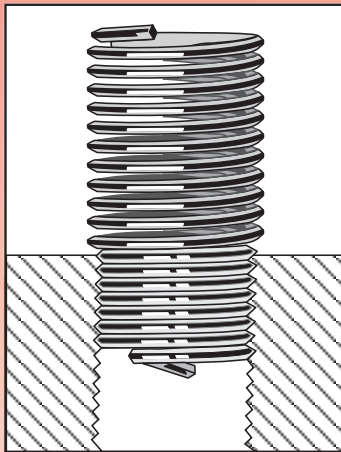
## STRIPPED



## REPAIRED



When threads become stripped, worn or damaged for any reason, the strength and reliability are greatly reduced. Potentially dangerous situations are eliminated when the damaged thread is repaired with Heli-Coil screw thread inserts. The Heli-Coil threaded insert provides stronger, more reliable threads than the original tapped hole and at the same time eliminates the possibility of thread wear, seizing and corrosion.



### RETENTION PRINCIPLE

Heli-Coil inserts are larger in diameter before installation than the tapped hole. During installation the inserting tool tightens the insert which reduces the diameter of the leading coil so it can enter the tapped hole. After installation, each high tensile stainless steel coil expands outward against the tapped hole to permanently anchor the insert.

Heli-Coil has the most effective and universally accepted method of thread repair. Heli-Coil inserts quickly and permanently restore stripped, worn or damaged threads to their original size and condition.

Heli-Coil inserts work in any part or material – aluminum, magnesium, cast iron, bronze, etc. Increasing use of light weight (and soft) materials of light weight (and soft) materials means more damage to threads. There is a Heli-Coil repair for virtually every application.

Damaged threads can be restored to better than new condition. The Heli-Coil system makes all other thread repair methods such as welding, plugging, oversized fasteners and over-

sized drilling of mating parts, obsolete. It's faster – you save time, increase your repair capabilities and restore parts that otherwise would have to be scrapped.

Stainless steel Heli-Coil inserts provide:

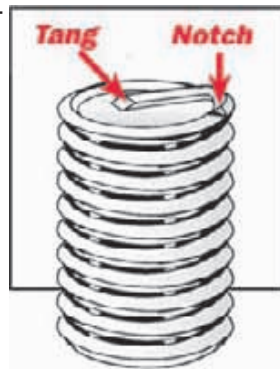
- Stronger Assemblies
- High Quality & Reliability
- Fastening Integrity Superior to the Original

*Heli-Coil inserts eliminate:*

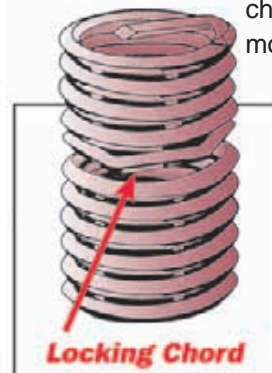
- Thread Wear
- Corrosion
- Galling
- Rust

Heli-Coil inserts are precision formed coils of extremely hard stainless steel (18-8) diamond shaped wire. When installed into a Heli-Coil tapped hole, the insert provides permanent conventional screw-threads.

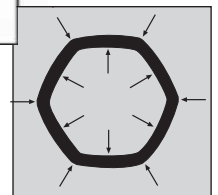
The insert has a driving "tang" for installation which is notched for easy removal.



Heli-Coil inserts are also available with a "Screw-Locking" feature: a series of



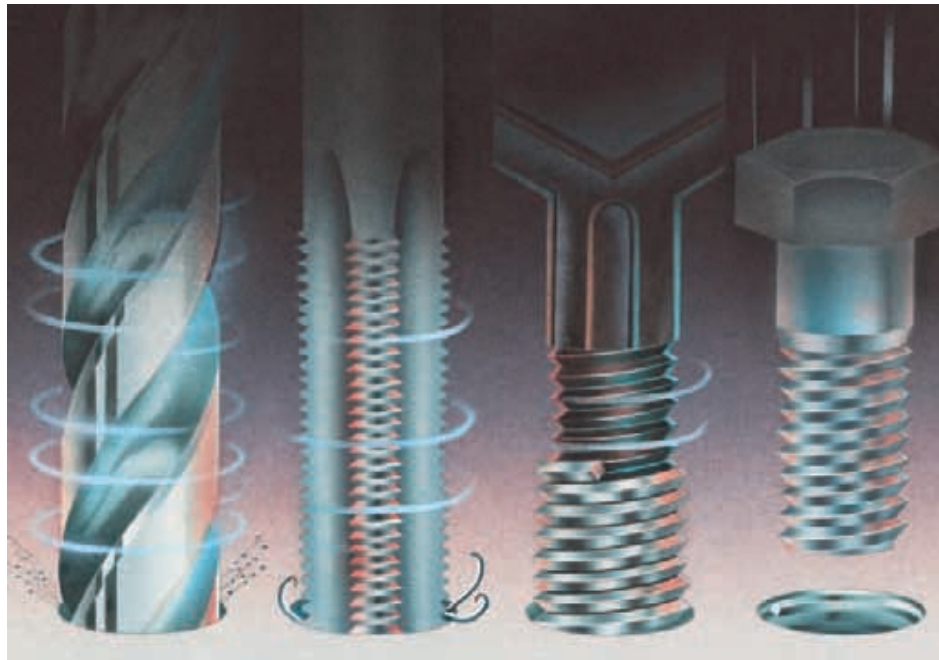
chords on one or more of the coils of the insert. They positively lock screws and bolts from loosening from impact or vibration.



## TABLE OF CONTENTS

<b>The Heli-Coil Thread Repair System</b>		
Introduction & Instructions	2 & 3	
<b>Inch Thread Repair Kits &amp; Sets</b>		
Professional Kits	4	
Master Thread Repair Kits	4 & 5	
Master Thread Repair Sets	5	
<b>Metric Thread Repair Kits &amp; Sets</b>		
Professional Kits	6	
Master Thread Repair Kits	6 & 7	
Master Thread Repair Sets	7	
<b>Spark Plug Series</b>		
Spark Plug Inserts & Kits	8	
Sav-A-Thread Inserts & Kits	8	
<b>Drill-Out Kits &amp; Tools</b>		9
<b>Pipe Thread Kits</b>		9
<b>Production Inserting Tools</b>		10
<b>Tang Break-Off &amp; Extracting Tools</b>		11
<b>Bulk Inserts</b>		
Inch		12
<b>Bulk Inserts</b>		
Metric, Spark Plug, Pipe Thread		13
<b>Heli-Coil STI Taps</b>		14

# The HELI-COIL Thread Repair System



## **Drill, Tap, Install... That's all!**

### **DRILL**

Drill out the damaged threads using the drill supplied in the kit. Drill to a sufficient depth to accommodate the insert length and the bolt or screw being used.

### **TAP**

Tap the hole using the Heli-Coil tap supplied in the kit. Check the size on the shank of the tap to be sure it is the right size.

Tap the hole to sufficient depth to accommodate the insert length and bolt or screw being used.

### **INSTALL**

Install the appropriate length insert from the kit. Use the installation tool supplied in the kit or set. Wind the insert into the hole until the top coil is 1/4 to 1/2 turn below the top surface.

### **TANG REMOVAL**

Remove the tang by using the tang break-off rod (when supplied with the kit) or a punch which fits the inside of the insert. Place the punch or rod squarely on the tang and strike hard.

For insert over 1/2 inch, 12mm, or for spark plug inserts, use long nose pliers. Holding the tang with the pliers, bend it alternately in and out until it comes free.

**Note:** For **Spark Plug** repairs, **NO** drilling is necessary. The Heli-Coil spark plug kit contains a piloted reamer tap. With this tap, the damaged threads are removed and new threads are cut in one continuous operation.

## **Tooling**

### **HELI-COIL DRILLS**

Heli-Coil High Speed Steel Drills are supplied in Master Thread Repair Sets (inch and metric) and all Thread Repair Kits except Spark Plug. All drills fit 1/2 inch chucks.

### **HELI-COIL TAPS**

The taps supplied with kits and sets are referred to as STI or Screw Thread Insert taps. These taps must be used for Heli-Coil repairs.

The STI taps supplied for standard thread repair look like conventional taps and may be used with the same tap handle as conventional taps.

Taps for **Spark Plug** applications are known as a piloted reamer tap. These taps have a pilot thread at the front to pull the tap into the hole. The reamer section that follows removes the damaged threads and then the STI portion of the tap cuts the proper thread

for the insert. **No drilling is required with Heli-Coil spark plug taps.**

### **HELI-COIL INSTALLATION TOOLS**

There are two types of Heli-Coil tools supplied in kits – threaded mandrel type and prewinder type. The prewinder tool is supplied in some coarse and all fine thread kits and sets. These inserts must be reduced in diameter before they are threaded into the tapped hole.

This is accomplished by winding the insert through a set of threads called a prewinder at the front of the tool. Generally, coarse thread inserts can be installed just as they come

from the package so a simple threaded mandrel type tool is supplied in the kit or set.





# INCH Thread Repair Kits & Sets

## PROFESSIONAL KITS

These kits include everything you need to do the job right – 3 lengths of inserts for multiple applications, drill, tap, installation tool and tang removal tool – all in a rugged new box.

Thread Size	Kit Part No.	Qty. Insert, Ea. Length	REPLACEMENT INSERTS			Tap	Installation Tool	Drill*	Tang* Removal Tool Size
			Short 1 Dia.	Medium 1-1/2 Dia.	Long 2 Dia.				
<b>INCH COARSE</b>									
4-40	5401-04	12	1185-04CN112	1185-04CN168	1185-04CN224	04CPB	2288-04	#31	5/64
5-40	5401-05	12	1185-05CN125	1185-05CN188	1185-05CN250	05CPB	7551-05	#29	3/32
6-32	5401-06	12	1185-06CN138	1185-06CN207	1185-06CN276	06CPB	2288-06	#25	3/32
8-32	5401-2	12	1185-2CN164	1185-2CN246	1185-2CN328	2CPB	2288-2	11/64	1/8
10-24	5401-3	12	1185-3CN190	1185-3CN285	1185-3CN380	3CPB	2288-3	13/64	1/8
12-24	5401-1	12	1185-1CN216	1185-1CN328	1185-1CN432	1CPB	2288-1	15/64	5/32
1/4-20	5401-4	12	1185-4CN250	1185-4CN375	1185-4CN500	4CPB	2288-4	17/64	3/16
5/16-18	5401-5	12	1185-5CN312	1185-5CN469	1185-5CN625	5CPB	2288-5	21/64	7/32
3/8-16	5401-6	6	1185-6CN375	1185-6CN562	1185-6CN750	6CPB	2288-6	25/64	9/32
7/16-14	5401-7	6	1185-7CN438	1185-7CN656	1185-7CN875	7CPB	2288-7	29/64	11/32
1/2-13	5401-8	6	1185-8CN500	1185-8CN750	1185-8CN1000	8CPB	2288-8	17/32	25/64
<b>INCH FINE</b>									
6-40	5402-06	12	1191-06CN138	1191-06CN207	1191-06CN276	06FPB	7552-6	#25	3/32
8-36	5402-2	12	1191-2CN164	1191-2CN246	1191-2CN328	2FPB	7552-2	#17	1/8
10-32	5402-3	12	1191-3CN190	1191-3CN285	1191-3CN380	3FPB	2299-3	13/64	1/8
1/4-28	5402-4	12	1191-4CN250	1191-4CN375	1191-4CN500	4FPB	2299-4	17/64	3/16
5/16-24	5402-5	12	1191-5CN312	1191-5CN469	1191-5CN625	5FPB	2299-5	21/64	7/32
3/8-24	5402-6	6	1191-6CN375	1191-6CN562	1191-6CN750	6FPB	2299-6	25/64	9/32
7/16-20	5402-7	6	1191-7CN438	1191-7CN656	1191-7CN875	7FPB	2299-7	29/64	11/32
1/2-20	5402-8	6	1191-8CN500	1191-8CN750	1191-8CN1000	8FPB	2299-8	33/64	25/64

\*Not available as replacement kit components.



Professional Kit



(A) Cardboard



(B) Metal Box

## MASTER THREAD REPAIR KITS

Includes medium length inserts, drill, tap and installation tool packaged in either (A) Cardboard Box or (B) Hinged Metal Box.

Thread Size + Length	Kit Part No.	Inserts Per Kit	KIT CONTENTS & REPLACEMENT PARTS				Drill* Size	Box Style
			Tap Part No.	Installation Tool P/N	Insert Pkg. P./N	Insert Quantity		
<b>INCH COARSE</b>								
9/16-12 x .844	5401-9	6	187-9	2288-9	R1185-9	6	19/32	A
5/8-11 x .938	5401-10	6	8187-10	2288-10	R1185-10	6	21/32	A
3/4-10 x 1.125	5401-12	4	8187-12	2288-12	R1185-12	4	25/32	A

\*Drills not available as replacement kit components.

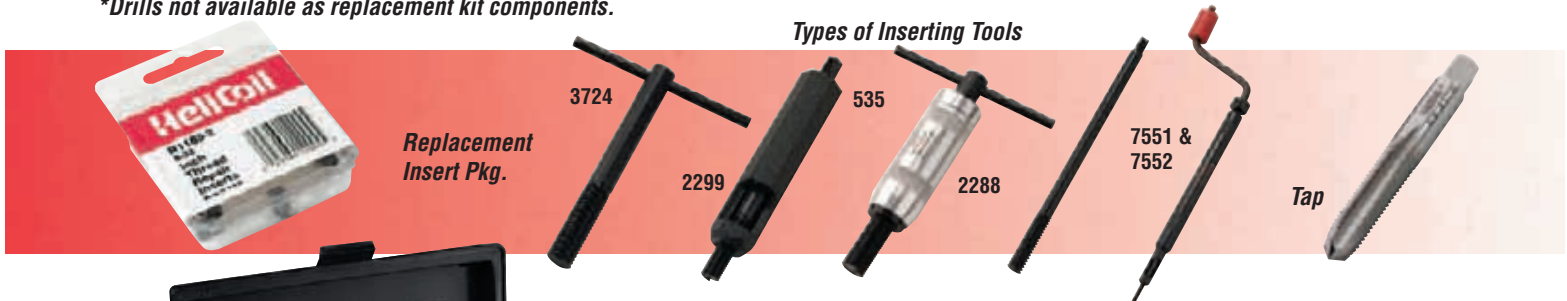


# INCH Thread Repair Kits & Sets

## MASTER THREAD REPAIR KITS (cont'd)

Thread Size + Length	Kit Part No.	Inserts Per Kit	KIT CONTENTS & REPLACEMENT PARTS				Drill* Size	Box Style
			Tap Part No.	Installation Tool P/N	Insert Pkg. P/N	Insert Quantity		
<b>INCH COARSE</b>								
7/8-9 x 1.312	5521-14	6	8187-14	3724-14	K1185-14	1	29/32	B
1-8 x 1.500	5521-16	6	8187-16	3724-16	K1185-16	1	1 1/32	B
1 1/8-7 x 1.688	5521-18	5	8187-18	3724-18	K1185-18	1	1 5/32	B
1 1/4-7 x 1.875	5521-20	4	8187-20	3724-20	K1185-20	1	1 9/32	B
1 3/8-6 x 2.062	5521-22	4	8187-22	3724-22	K1185-22	1	1 13/32	B
1 1/2-6 x 2.250	5521-24	4	8187-24	3724-24	K1185-24	1	1 17/32	B
<b>INCH FINE</b>								
9/16-18 x .844	5402-9	6	38193-9	2299-9	R1191-9	6	37/64	A
5/8-18 x .938	5402-10	6	8193-10	2299-10	R1191-10	6	41/64	A
3/4-16 x 1.125	5402-12	4	8193-12	2299-12	R1191-12	4	49/64	A
7/8-14 x 1.312	5528-14	6	8193-14	535-14	K1191-14	1	57/64	B
1-14 x 1.500	5528-16	6	8193-16	535-16	K1191-16	1	1 1/64	B
1-12 x 1.500	5528-161	6	8193-161	535-161	K1191-161	1	1 1/64	B
1 1/8-12 x 1.688	5528-18	5	8193-18	535-18	K1191-18	1	1 5/32	B
1 1/4-12 x 1.875	5528-20	4	8193-20	535-20	K1191-20	1	1 9/32	B
1 3/8-12 x 2.062	5528-22	4	8193-22	535-22	K1191-22	1	1 17/32	B
1 1/2-12 x 2.250	5528-24	4	8193-24	535-24	K1191-24	1	1 17/32	B

\*Drills not available as replacement kit components.



Types of Inserting Tools



## MASTER THREAD REPAIR SETS

Thread Size + Length	Insert Pkg. P/N	Insert Qty.	Tap P/N	Drill* Size	Installation Tool P/N
<b>PART NO. 4934 – CONTENTS</b>					
1/4-20 x .375	R1185-4	12	4CPB	17/64	2288-4
5/16-18 X .469	R1185-5	12	5CPB	21/64	2288-5
3/8-16 X .562	R1185-6	12	6CPB	25/64	2288-6
7/16-14 X .656	R1185-7	6	7CPB	29/64	2288-7
1/2-13 X .750	R1185-8	6	8CPB	17/32	2288-8
5/8-11 X .938	R1185-10	6	8187-10	21/32	2288-10
<b>PART NO. 4936 – CONTENTS</b>					
10-32 x .285	R1191-3	12	3FPB	13/64	2299-3
1/4-28 X .375	R1191-4	12	4FPB	17/64	2299-4
5/16-24 X .469	R1191-5	12	5FPB	21/64	2299-5
3/8-24 X .562	R1191-6	12	6FPB	25/64	2299-6
7/16-20 X .656	R1191-7	6	7FPB	29/64	2299-7
1/2-20 X .750	R1191-8	6	8FPB	33/64	2299-8

\*Drills not available as replacement kit components.

The professional's choice! These sets contain repairs for the most commonly used thread sizes. Two master sets for inch sizes are available – Inch Coarse and Inch Fine. The coarse set contains five sizes: 1/4, 5/16, 3/8, 7/16, 1/2 and 5/8. The fine set has size sizes: #10, 1/4, 5/16, 3/8, 7/16 and 1/2. Each set has a drill, tap, installation tool, a quantity of inserts for each size and complete instructions.

# METRIC Thread Repair Kits & Sets

## PROFESSIONAL KITS

These kits include everything you need to do the job right – 3 lengths of inserts for multiple applications, drill, tap, installation tool and tang removal tool – all in a rugged new box.

Thread Size	Kit Part No.	Qty/Insert Each Length	REPLACEMENT INSERTS			Tap	Installation Tool	Tool Style	Drill*	Tang* Removal Tool Size
			Short 1 Dia.	Medium 1-1/2 Dia.	Long 2 Dia.					
<b>METRIC COARSE</b>										
M3x0.5	5403-3	12	1084-3CN030	1084-3CN045	1084-3CN060	2087-3	7751-3	A	1/8	3/32
M3.5x0.6	5403-3.5	12	1084-3.5CN035	1084-3.5CN053	1084-3.5CN070	2087-3.5	7751-3.5	A	#27	3/32
M4x0.7	5403-4	6	1084-4CN040	1084-4CN060	1084-4CN080	2087-4	3747-4	B	11/64	1/8
M5x0.8	5403-5	6	1084-5CN050	1084-5CN075	1084-5CN100	2087-5	3747-5	B	13/64	5/32
M6x1	5403-6	6	1084-6CN060	1084-6CN090	1084-6CN120	2087-6	3747-6	B	1/4	3/16
M7x1	5403-7	6	1084-7CN070	1084-7CN105	1084-7CN140	2087-7	3747-7	C	9/32	7/32
M8x1.25	5403-8	6	1084-8CN080	1084-8CN120	1084-8CN160	2087-8	3747-8	C	21/64	7/32
M10x1.5	5403-10	6	1084-10CN100	1084-10CN150	1084-10CN200	2087-10	3747-10	C	13/32	9/32
M12x1.75	5403-12	6	1084-12CN120	1084-12CN180	1084-12CN240	2087-12	3747-12	C	31/64	25/64
<b>METRIC FINE</b>										
M8x1	5404-8	6	4255-8CN080	4255-8CN120	4255-8CN160	4984-8	4835-8	B	21/64	7/32
M10x1	5404-10	6	4255-10CN100	4255-10CN150	4255-10CN200	4984-10	4835-10	B	13/32	9/32
M10x1.25	5405-10	6	4649-10CN100	4649-10CN150	4649-10CN200	4944-10	4640-10	B	13/32	9/32
M12x1.25	5405-12	6	4649-12CN120	4549-12CN180	4649-12CN240	4944-12	4640-12	B	31/64	25/64
M12x1.5	5406-12	6	3745-12CN120	3745-12CN180	3745-12CN240	4976-12	4973-12	B	31/64	25/64

\* Not available as replacement kit components.



Master Kit

Professional Kit



## MASTER THREAD REPAIR KITS

Includes medium length inserts, drill, tap and installation tool packed in a durable cardboard box.

Thread Size	Length	Kit Part No.	Inserts Per Kit	KIT CONTENTS & REPLACEMENT PARTS					Drill* Size
				Tap Part No.	Installation Tool P/N	Tool Style	Insert Pkg. P/N	Insert Quantity	
<b>METRIC COARSE</b>									
M14x2	21.0	5403-14	12	2087-14	3747-14	C	R1084-14	6	37/64
M16x2	24.0	5403-16	6	2087-16	3747-16	C	R1084-16	6	21/32
M18x2.5	27.0	5403-18	6	2087-18	3747-18	C	R1084-18	6	47/64
M20x2.5	30.0	5403-20	4	2087-20	3747-20	C	K1084-20	3	13/16

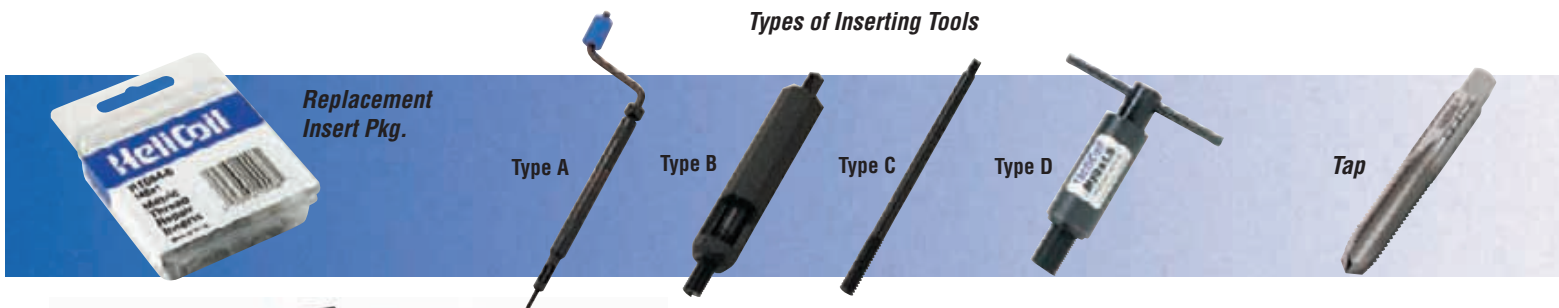
\* Drills not available as replacement kit components.

# METRIC Thread Repair Kits & Sets

## THREAD REPAIR KIT (cont'd)

Thread Size	Length	Kit Part No.	Inserts Per Kit	KIT CONTENTS & REPLACEMENT PARTS					Drill* Size
				Tap Part No.	Installation Tool P/N	Tool Style	Insert Pkg. P/N	Insert Quantity	
<b>METRIC COARSE</b>									
M14x1.5	21.0	5406-14	12	4976-14	4973-14	D	R3745-14	6	9/16
M16x1.5	24.0	5406-16	6	4976-16	4973-16	D	R3745-16	6	21/32
M18x1.5	27.0	5406-18	6	4976-18	4973-18	D	R3745-18	6	23/32

\* Drills not available as replacement kit components.



These sets contain repairs for the most commonly used thread sizes. Two sets are available, part number 4937-150 which contains sizes M5, M6, M8 and M10x1.5 and part number 4937-125 which contains M5, M6, M8 and M10x1.25. Each set has a drill bit, tap, installation tool, a quantity of inserts for each size and complete instructions.

## MASTER THREAD REPAIR SETS

Thread Size	Length	Insert Pkg. P/N	Insert Qty.	Tap P/N	Installation Tool P/N	Tool Style	Drill* Size
<b>PART NO. 4937-150 – CONTENTS</b>							
M5 x 0.8	7.5	R1084-5	12	2087-5	3747-5	B	13/64
M6 x 1	9.0	R1084-6	12	2087-6	3747-6	B	1/4
M8 x 1.25	12.0	R1084-8	12	2087-8	3747-8	C	21/64
M10 x 1.5	15.0	R1084-10	12	2087-10	3747-10	C	13/32
<b>PART NO. 4937-125 – CONTENTS</b>							
M5 x 0.8	7.5	R1084-5	12	2087-5	3747-5	B	13/64
M6 x 1	9.0	R1084-6	12	2087-6	3747-6	B	1/4
M8 x 1.25	12.0	R1084-8	12	2087-8	3747-8	C	21/64
M10 x 1.25	15.0	R4649-10	12	4944-10	4640-10	B	3/32

\* Drills not available as replacement kit components.

# SPARK PLUG Series

## SPARK PLUG

Heli-Coil is the original spark plug port thread repair. These kits offer the highest quality and most durable repair available. The first choice of professional mechanics and engine rebuilders, Heli-Coil Wire Spark Plug Inserts are available for any engine. Kits are available in sizes M10, M12, M14, M18, and 7/8". Each kit contains a piloted tap (no drilling necessary), an installation tool, and a quantity of inserts. The M12 and M14 kits contain several insert lengths to accommodate all spark plug reaches. Heli-Coil Spark Plug Inserts are the preferred method of repair specified by virtually all U.S. and foreign vehicle manufacturers.



### KIT CONTENTS AND REPLACEMENT PARTS

Thread Size	Reach	Kit Part No.	Inserts Per Kit	Tap Part No.	Installation Tool Part No.	Reach	Insert Pkg. Pack No.	Insert Quantity
10-1.0mm	1/2"	5523-10	24	1030-10	4971-10	1/2"	R474-4	6
12-1.25mm	1/2"	5523-12	12	1030-12	4971-12	1/2"	R482-1	6
	3/4"		12			3/4"	R482-2	6
14-1.25mm	3/8"	5523-14	6	1030-14	4971-14	3/8"	R512	6
	7/16"		6			7/16"	R513	6
	1/2"		6			1/2"	R513-13	6
	3/4"		6			3/4"	R513-10	6
	.472"		6			.472"	R513-20	6
18-1.50mm	1/2"	5523-18	24	1030-18	4971-18	1/2"	R514-6	6
7/8-18	1/2"-5/8"	550	10	549	548	1/2"-5/8"	K518-12	5

Do **NOT** use Heli-Coil wire inserts to repair taper seat spark plug ports.



## SAV-A-THREAD

The only thread repair product that can be used to repair both taperseat and gasket type spark plug assemblies. Sav-A-Thread is the easiest way to permanently repair stripped spark plug hole threads.

- Three insert lengths are available to accommodate all spark plug reaches.
- Positive mechanical locking feature means the insert will never come out!
- The piloted reamer tap means no drilling is necessary and perfect alignment of the tapped hole is attained.

### PART NO. 5408-14

### KIT CONTENTS AND REPLACEMENT PARTS

Size	Part No.	Reach	Insert Per Kit	Tap Part No.	Installation Tool Part No.	Insert Pkg. Part No.	Pkg. Insert Qty.
M14x1.25	5408-14	Short	6	5329-14	5332-14	R5326-14S-6	6
		Normal	6			R5326-14N-6	6
		Long	6			R5326-14L-6	6

Note: Heli-Coil recommends removing the head before installation to insure chips do not enter cylinder.



# PRODUCTION Inserting Tools

The various designs of Heli-Coil inserting tools are pictured left. Generally, finer pitch inserts are proportionately larger in the free state than coarse pitch inserts and thus have to be "pre-wound" to a smaller diameter for installation. Large coarse pitch inserts (and 2-56 and 3-48 inserts) need only a threaded mandrel tool for installation.

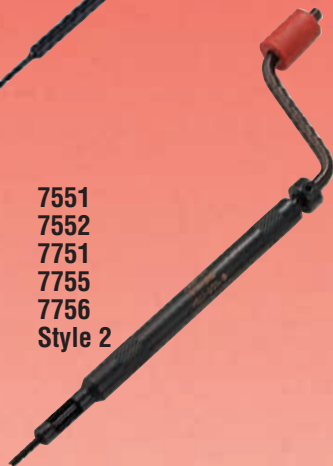
551  
7751  
Style 1



552-03



7551  
7552  
7751  
7755  
7756  
Style 2



3724  
7751  
Style 3



535  
7751  
7753  
Style 4



## INCH SERIES

Size	Part No.	Style	Size	Part No.	Style
<b>UNIFIED COARSE</b>			<b>UNIFIED FINE</b>		
2-56	551-02	1	3-56	7552-03	2
3-48	551-03	-	4-48	7552-04	2
4-40	7551-04	2	6-40	7552-06	2
5-40	7551-05	2	8-36	7552-2	2
6-32	7551-06	2	10-32	7552-3	2
8-32	7551-2	2	1/4-28	7552-4	2
10-24	7551-3	2	5/16-24	7552-5	2
12-24	7551-1	2	3/8-24	7552-6	2
1/4-20	7551-4	2	7/16-20	7552-7	2
5/16-18	7551-5	2	1/2-20	7552-8	2
3/8-16	7551-6	2	9/16-18	535-9	4
7/16-14	7551-7	2	5/8-18	535-10	4
1/2-13	7551-8	2	3/4-16	535-12	4
9/16-12	3724-9	3	7/8-14	535-14	4
5/8-11	3724-10	3	1-12	535-161	4
3/4-10	3724-12	3	1-14	535-16	4
7/8-9	3724-14	3	1-1/8-12	535-18	4
1-8	3724-16	3	1-1/4-12	535-20	4
1-1/8-7	3724-18	3	1-3/8-12	535-22	4
1-1/4-7	3724-20	3	1-1/2-12	535-24	4
1-3/8-6	3724-22	3			
1-1/2-6	3724-24	3			

## METRIC SERIES

<b>METRIC COARSE</b>			<b>METRIC FINE</b>		
M2.2x0.45	7751-2.2	1	M8x1	7755-8	2
M2.5x0.45	7751-2.5	2	M10x1	7755-10	2
M3x0.5	7751-3	2	M10x1.25	7756-10	2
M3.5x0.6	7751-3.5	2	M12x1.25	7756-12	2
M4x0.7	7751-4	2	M12x1.5	7753-12	2
M5x0.8	7751-5	2	M14x1.5	7753-14	4
M6x1	7751-6	2	M16x1.5	7753-16	4
M7x1	7751-7	2	M18x1.5	7753-18	4
M8x1.25	7751-8	2			
M10x1.5	7751-10	2			
M12x1.75	7751-12	2			
M14x2	7751-14	4			
M16x2	7751-16	4			
M18x2.5	7751-18	4			
M20x2.5	7751-20	4			
M22x2.5	7751-22	3			
M24x3	7751-24	3			

# Tang Break-Off and Extracting Tools

## TANG BREAK-OFF TOOLS

The driving tangs of Heli-Coil Inserts must be removed to eliminate their interference with the end of the assembled bolt. Tang Break-Off Tools are available for use with inserts through 1/2" and M12 nominal diameter. Their operation is automatic, having a spring loaded, easily triggered punch that strikes a sharp, uniform blow against the tang of the installed insert.

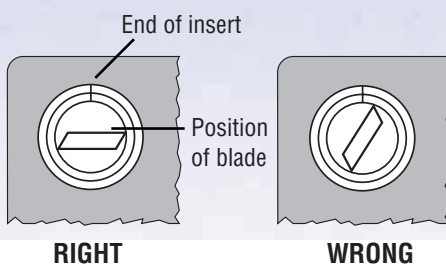
Tang Break-Off Tools



Extracting Tool



### EXTRACTING TOOL POSITION



### INCH SERIES

Size	Part No.	Size	Part No.
<b>UNIFIED FINE</b>		<b>UNIFIED FINE</b>	
2-56	3695-02	3-56	3695-02
3-48	3695-02	4-48	3695-04
4-40	3695-04	6-40	3695-06
5-40	3695-04	8-36	3695-2
6-32	3695-06	10-32	3695-3
8-32	3695-2	1/4-28	3695-4
10-24	3695-3	5/16-24	3692-5
12-24	3695-3	3/8-24	3692-6
1/4-20	3695-4	7/16-20	3692-7
5/16-18	3695-5	1/2-20	3692-8
3/8-16	3695-6		
7/16-14	3695-7		
1/2-13	3695-8		

### METRIC SERIES

<b>METRIC COARSE</b>			
M2.2	4238-2.2		
M2.5	4238-2.2		
M3	4238-3		
M3.5	4238-3		
M4	4238-4		
M5	4238-5		
M6	4238-6		
M7	4238-7		
M8	4238-8		
M10	4238-10		
M12	4238-12		

For sizes above 1/2" and 12mm use long nose pliers.

## EXTRACTING TOOLS

Tools to remove Heli-Coil inserts are listed below. This is done by applying the tool to the insert (see illustration at left), striking the head of the tool a light blow and turning it counterclockwise, maintaining steady downward pressure.

<b>INCH SERIES</b>		<b>METRIC SERIES</b>	
Nominal Size	Part No.	Nominal Size	Part No.
#2	1227-02	M2.2	1227-02
#3 thru #8	1227-06	M2.5 thr M4.5	1227-06
#10 thru 3/8"	1227-6	M5 thru M10	1227-6
7/17" thru 1"	1227-16	M11 thru M24	1227-16
1-1/8" thru 1-1/2"	1227-24	M27 thru M39	1227-24

For sizes above 12" use long nose pliers.

# BULK Inserts

## FREE RUNNING – INCH

## SCREW-LOCK – INCH

Size + Length	Part No.	Size + Length	Part No.	Size + Length	Part No.	Size + Length	Part No.
2-56 { 086 129 172	1185-02CN086 1185-02CN129 1185-02CN172	1/2-13 { 500 750 1000	1185-8CN500 1185-8CN750 1185-8CN1000	2-56 { 086 129 172	3585-02CN086 3585-02CN129 3585-02CN172	5/16-24 { 312 469 625	3591-5CN312 3591-5CN469 3591-5CN625
3-48 { 099 148 198	1185-03CN099 1185-03CN148 1185-03CN198	1/2-20 { 500 750 1000	1191-8CN 500 1191-8CN750 1191-8CN1000	3-48 { 099 148 198	3585-03CN099 3585-03CN148 3585-03CN198	3/8-16 { 375 562 750	3585-6CN375 3585-6CN562 3585-6CN750
3-56 { 099 148 198	1191-03CN099 1191-03CN148 1191-03CN198	9/16-12 { 562 844 1125	1185-9CN562 1185-9CN844 1185-9CN1125	3-56 { 099 148 198	3591-03CN099 3591-03CN148 3591-03CN198	3/8-24 { 375 562 750	3591-6CN375 3591-6CN562 3591-6CN750
4-40 { 112 168 224	1185-04CN112 1185-04CN168 1185-04CN224	9/16-18 { 562 844 1125	1191-9CN562 1191-9CN844 1191-9CN1125	4-40 { 112 168 224	3585-04CN112 3585-04CN168 3585-04CN224	7/16-14 { 438 656 875	3585-7CN438 3585-7CN656 3585-7CN875
4-48 { 112 168 224	1191-04CN112 1191-04CN168 1191-04CN224	5/8-11 { 625 938 1250	1185-10CN625 1185-10CN938 1185-10CN1250	4-48 { 112 168 224	3591-04CN112 3591-04CN168 3591-04CN224	7/16-20 { 438 656 875	3591-7CN438 3591-7CN656 3591-7CN875
5-40 { 125 188 250	1185-05CN125 1185-05CN188 1185-05CN250	5/8-18 { 625 938 1250	1191-10CN625 1191-10CN938 1191-10CN1250	5-40 { 125 188 250	3585-05CN125 3585-05CN188 3585-05CN250	1/2-13 { 500 750 1000	3585-8CN500 3585-8CN750 3585-8CN1000
6-32 { 138 207 276	1185-06CN138 1185-06CN207 1185-06CN276	3/4-10 { 750 1125 1500	1185-12CN750 1185-12CN1125 1185-12CN1500	6-32 { 138 207 276	3585-06CN138 3585-06CN207 3585-06CN276	1/2-20 { 500 750 1000	3591-8CN 500 3591-8CN750 3591-8CN1000
6-40 { 138 207 276	1191-06CN138 1191-06CN207 1191-06CN276	3/4-16 { 750 1125 1500	1191-12CN750 1191-12CN1125 1191-12CN1500	6-40 { 138 207 276	3591-06CN138 3591-06CN207 3591-06CN276	9/16-12 { 562 844 1125	3585-9CN562 3585-9CN844 3585-9CN1125
8-32 { 164 246 328	1185-2CN164 1185-2CN246 1185-2CN328	7/8-9 { 875 1312 1750	1185-14CN875 1185-14CN1312 1185-14CN1750	8-32 { 164 246 328	3585-2CN164 3585-2CN246 3585-2CN328	9/16-18 { 562 844 1125	3591-9CN562 3591-9CN844 3591-9CN1125
8-36 { 164 246 328	1191-2CN164 1191-2CN246 1191-2CN328	7/8-14 { 875 1312 1750	1191-14CN875 1191-14CN1312 1191-14CN1750	8-36 { 164 246 328	3591-2CN164 3591-2CN246 3591-2CN328	5/8-11 { 625 938 1250	3585-10CN625 3585-10CN938 3585-10CN1250
10-24 { 190 285 380	1185-3CN190 1185-3CN285 1185-3CN380	1-8 { 1000 1500 2000	1185-16CN1000 1185-16CN1500 1185-16CN2000	10-24 { 190 285 380	3585-3CN190 3585-3CN285 3585-3CN380	5/8-18 { 625 938 1250	3591-10CN625 3591-10CN938 3591-10CN1250
10-32 { 190 285 380	1191-3CN190 1191-3CN285 1191-3CN380	1-14 { 1000 1500 2000	1191-16CN1000 1191-16CN1500 1191-16CN2000	10-32 { 190 285 380	3591-3CN190 3591-3CN285 3591-3CN380	3/4-10 { 750 1125 1500	3585-12CN750 3585-12CN1125 3585-12CN1500
12-24 { 216 324 432	1185-1CN216 1185-1CN324 1185-1CN432	1-12 { 1000 1500 2000	1191-161CN1000 1191-161CN1500 1191-161CN2000	12-24 { 216 324 432	3585-1CN216 3585-1CN324 3585-1CN432	3/4-18 { 750 1125 1500	3591-12CN750 3591-12CN1125 3591-12CN1500
1/4-20 { 250 375 500	1185-4CN250 1185-4CN375 1185-4CN500	1-1/8-7 { 1125 1688 2250	1185-18CN1125 1185-18CN1688 1185-18CN2250	1/4-20 { 250 375 500	3585-4CN250 3585-4CN375 3585-4CN500	7/8-9 { 875 1312 1750	3585-14CN875 3585-14CN1312 3585-14CN1750
1/4-28 { 250 375 500	1191-4CN250 1191-4CN375 1191-4CN500	1-1/8-12 { 1125 1688 2250	1191-18CN1125 1191-18CN1688 1191-18CN2250	1/4-28 { 250 375 500	3591-4CN250 3591-4CN375 3591-4CN500	7/8-14 { 875 1312 1750	3591-14CN875 3591-14CN1312 3591-14CN1750
5/16-18 { 312 469 625	1185-5CN312 1185-5CN469 1185-5CN625	1-1/4-7 { 1250 1875 2500	1185-20CN1250 1185-20CN1875 1185-20CN2500	5/16-18 { 312 469 625	3585-5CN312 3585-5CN469 3585-5CN625	1-8 { 1000 1500 2000	3585-16CN1000 3585-16CN1500 3585-16CN2000
5/16-24 { 312 469 625	1191-5CN312 1191-5CN469 1191-5CN625	1-1/4-12 { 1250 1875 2500	1191-20CN1250 1191-20CN1875 1191-20CN2500			1-14 { 1000 1500 2000	3591-16CN1000 3591-16CN1500 3591-16CN2000
3/8-16 { 375 562 750	1185-6CN375 1185-6CN562 1185-6CN750	1-3/8-6 { 1375 2062 2750	1185-22CN1375 1185-22CN2062 1185-22CN2750			1-12 { 1000 1500 2000	3591-161CN1000 3591-161CN1500 3591-161CN2000
3/8-24 { 375 562 750	1191-6CN375 1191-6CN562 1191-6CN750	1-3/8-12 { 1375 2062 2750	1191-22CN1375 1191-22CN2062 1191-22CN2750				
7/16-14 { 438 656 875	1185-7CN438 1185-7CN656 1185-7CN875	1-1/2-6 { 1500 2250 3000	1185-24CN1500 1185-24CN2250 1185-24CN3000				
7/16-20 { 438 656 875	1191-7CN438 1191-7CN656 1191-7CN875	1-1/2-12 { 1500 2250 3000	1191-24CN1500 1191-24CN2250 1191-24CN3000				



## FREE RUNNING – METRIC

Size + Length	Part No.	Size + Length	Part No.	Size + Length	Part No.
M2.2x0.45	{ 022 1084-2.2CN022	M18X1.5	{ 180 3745-18CN180	M14x2	{ 140 4184-14CN140
	{ 033 1084-2.2CN033		{ 270 3745-18CN270		{ 210 4184-14CN210
	{ 044 1084-2.2CN044		{ 360 3745-18CN360		{ 280 4184-14CN280
M2.5x0.45	{ 025 1084-2.5CN025	M20X2.5	{ 200 1084-20CN200	M14X1.5	{ 140 5145-14CN140
	{ 038 1084-2.5CN038		{ 300 1084-20CN300		{ 210 5145-14CN210
	{ 050 1084-2.5CN050		{ 400 1084-20CN400		{ 280 5145-14CN280
M3x0.5	{ 030 1084-3CN030	M22X2.5	{ 220 1084-22CN220	M16X2	{ 160 4184-16CN160
	{ 045 1084-3CN045		{ 330 1084-22CN330		{ 240 4184-16CN240
	{ 060 1084-3CN060		{ 440 1084-22CN440		{ 320 4184-16CN320
M3.5x0.6	{ 035 1084-3.5CN035	M24X3	{ 240 1084-24CN240	M16X1.5	{ 160 5145-16CN160
	{ 053 1084-3.5CN053		{ 360 1084-24CN360		{ 240 5145-16CN240
	{ 070 1084-3.5CN070		{ 480 1084-24CN480		{ 320 5145-16CN320
M4x0.7	{ 040 1084-4CN040	<b>SCREW-LOCK – METRIC</b>			
	{ 060 1084-4CN060	<b>Size + Length Part No.</b>			
	{ 080 1084-4CN 080	M2.2x0.45	{ 022 4184-2.2CN022	M18X2.5	{ 180 4184-18CN180
M5x0.8	{ 033 4184-2.2CN033		{ 270 4184-18CN270		
	{ 100 1084-5CN100		{ 044 4184-2.2CN044		{ 360 4184-18CN360
	M6x1	{ 025 4184-2.5CN025	M18X1.5	{ 180 5145-18CN180	
{ 038 4184-2.5CN038		{ 270 5145-18CN270			
{ 050 4184-2.5CN050		{ 360 5145-18CN360			
M7x1	{ 030 4184-3CN030	M20X2.5	{ 200 4184-20CN200	M22X2.5	{ 220 4184-22CN220
	{ 045 4184-3CN045		{ 300 4184-20CN300		{ 330 4184-22CN330
	{ 060 4184-3CN060		{ 400 4184-20CN400		{ 440 4184-22CN440
M8x1.25	{ 070 1084-7CN070	M24x3	{ 240 4184-24CN240	M24x3	{ 240 4184-24CN240
	{ 105 1084-7CN105		{ 360 4184-24CN360		{ 360 4184-24CN360
	{ 140 1084-7CN140		{ 480 4184-24CN480		{ 480 4184-24CN480
M8x1	{ 080 4255-8CN080	M3.5x0.6	{ 035 4184-3.5CN035	M4x0.7	{ 040 4184-4CN040
	{ 120 4255-8CN120		{ 053 4184-3.5CN053		{ 060 4184-4CN060
	{ 160 4255-8CN160		{ 070 4184-3.5CN070		{ 080 4184-4CN 080
M10x1.5	{ 100 1084-10CN100	M5x0.8	{ 050 4184-5CN050	M5x0.8	{ 050 4184-5CN050
	{ 150 1084-10CN150		{ 075 4184-5CN075		{ 075 4184-5CN075
	{ 200 1084-10CN200		{ 100 4184-5CN100		{ 100 4184-5CN100
M10x1	{ 100 4255-10CN100	M6x1	{ 060 4184-6CN060	M6x1	{ 060 4184-6CN060
	{ 150 4255-10CN150		{ 090 4184-6CN090		{ 090 4184-6CN090
	{ 200 4255-10CN200		{ 120 4184-6CN120		{ 120 4184-6CN120
M10x1.25	{ 100 4649-10CN100	M7x1	{ 070 4184-7CN070	M7x1	{ 070 4184-7CN070
	{ 150 4649-10CN150		{ 105 4184-7CN105		{ 105 4184-7CN105
	{ 200 4649-10CN200		{ 140 4184-7CN140		{ 140 4184-7CN140
M12x1.75	{ 120 1084-12CN120	M8x1.25	{ 080 4184-8CN080	M8x1.25	{ 080 4184-8CN080
	{ 180 1084-12CN180		{ 120 4184-8CN120		{ 120 4184-8CN120
	{ 240 1084-12CN240		{ 160 4184-8CN160		{ 160 4184-8CN160
M12x1.5	{ 120 3745-12CN120	M8x1	{ 080 5255-8CN080	M8x1	{ 080 5255-8CN080
	{ 180 3745-12CN180		{ 120 5255-8CN120		{ 120 5255-8CN120
	{ 240 3745-12CN240		{ 160 5255-8CN160		{ 160 5255-8CN160
M12x1.25	{ 120 4649-12CN120	M10x1.5	{ 100 4184-10CN100	M10x1.5	{ 100 4184-10CN100
	{ 180 4649-12CN180		{ 150 4184-10CN150		{ 150 4184-10CN150
	{ 240 4649-12CN240		{ 200 4184-10CN200		{ 200 4184-10CN200
M14x2	{ 140 1084-14CN140	M10x1	{ 100 5255-10CN100	M10x1	{ 100 5255-10CN100
	{ 210 1084-14CN210		{ 150 5255-10CN150		{ 150 5255-10CN150
	{ 280 1084-14CN280		{ 200 5255-10CN200		{ 200 5255-10CN200
M14X1.5	{ 140 3745-14CN140	M10x1.25	{ 100 5649-10CN100	M10x1.25	{ 100 5649-10CN100
	{ 210 3745-14CN210		{ 150 5649-10CN150		{ 150 5649-10CN150
	{ 280 3745-14CN280		{ 200 5649-10CN200		{ 200 5649-10CN200
M16X2	{ 160 1084-16CN160	M12x1.75	{ 120 4184-12CN120	M12x1.75	{ 120 4184-12CN120
	{ 240 1084-16CN240		{ 180 4184-12CN180		{ 180 4184-12CN180
	{ 320 1084-16CN320		{ 240 4184-12CN240		{ 240 4184-12CN240
M16X1.5	{ 160 3745-16CN160	M12x1.5	{ 120 5145-12CN120	M12x1.5	{ 120 5145-12CN120
	{ 240 3745-16CN240		{ 180 5145-12CN180		{ 180 5145-12CN180
	{ 320 3745-16CN320		{ 240 5145-12CN240		{ 240 5145-12CN240
M18X2.5	{ 180 1084-18CN180	M12x1.25	{ 120 5649-12CN120	M12x1.25	{ 120 5649-12CN120
	{ 270 1084-18CN270		{ 180 5649-12CN180		{ 180 5649-12CN180
	{ 360 1084-18CN360		{ 240 5649-12CN240		{ 240 5649-12CN240

Heli-Coil Stainless Steel inserts are available in bulk for higher quantity applications such as rebuilding or remanufacture. Each size comes in three different lengths:

**SHORT (One times the diameter of the bolt or screw)** – for short thread engagement applications.

**MEDIUM (1-1/2 times the diameter of the bolt or screw)** – provides sufficient strength in most applications.

**LONG (Two times the diameter of the bolt or screw)** – provides higher strength in critical applications, (especially in magnesium).

## SPARK PLUG

Thread Size	Reach	Insert No.
10-1.0mm	1/2"	474-4
12-1.25mm	1/2"	482-1
12-1.25mm	3/4"	482-2
14-1.25mm	3/8"	512
	7/16"	513
	1/2"	513-13
	3/4"	513-10
	.472	513-20
18-1.50mm	1/2"	514-6
7/18-18	1/2" & 5/8"	518-12
M14x1.215	Short	5326-14S
	Normal	5326-14N
	Long	5326-14L

## PIPE THREAD

(for Taper Pipe Threads)

Nominal Thread Size	Part Number
1/8-27	327-2
1/4-18	327-4
3/8-18	327-6
1/2-14	327-8
3/4-14	327-12
1-11-1/2	327-16





# HELI-COIL STI Taps

Straight flute taps, available in both plug style and bottoming style, are widely used for general hand and machine tapping operations.

## PLUG STYLE (4 thread chamfer):

Used in thru holes and in blind holes that allow for ample chip clearance. They are easier starting and require less tapping torque than bottoming taps.

## BOTTOMING STYLE (2 thread chamfer):

Used in blind holes drilled to a minimum depth that require threads close to the bottom of the hole.



## INCH SERIES

Nominal Thread Size	Plug Style Part No.	Bottoming Style Part No.
<b>UNIFIED COARSE</b>		
2-56	02CPB	02CBB
3-48	03CPB	03CBB
4-40	04CPB	04CBB
5-40	05CPB	05CBB
6-32	06CPB	06CBB
8-32	2CPB	2CBB
10-24	3CPB	3CBB
12-24	1CPB	1CBB
1/4-20	4CPB	4CBB
5/16-18	5CPB	5CBB
3/8-16	6CPB	6CBB
7/16-14	7CPB	7CBB
1/2-13	8CPB	8CBB
9/16-12	187-9	4187-9
5/8-11	8187-10	10187-10
3/4-10	8187-12	10187-12
7/8-9	8187-14	10187-14
1-8	8187-16	10187-16
1-1/8-7	8187-18	10187-18
1-1/4-7	8187-20	10187-20
1-3/8-6	8181-22	10187-22
1-1/2-6	8187-24	10187-24
<b>UNIFIED FINE</b>		
3-56	03FPB	03FBB
4-48	04FPB	04FBB
6-40	06FPB	06FBB
8-36	2FPB	2FBB
10-32	3FPB	3FBB
1/4-28	4FPB	4FBB
5/16-24	5FPB	5FBB
3/8-24	6FPB	6FBB
7/16-20	7FPB	7FBB
1/2-20	8FPB	8FBB
9/16-18	38193-9	43193-9
5/8-18	8193-10	10193-10
3/4-16	8193-12	10193-12
7/8-14	8193-14	10193-14
1-14	8193-16	10193-16
1-12	8193-161	10193-161
1-1/8-12	8193-18	10193-18
1-1/4-12	8193-20	10193-20
1-3/8-12	8193-22	10193-22
1-1/2-12	8193-24	10193-24

## METRIC SERIES

Nominal Thread Size	Plug Style Part No.	Bottoming Style Part No.
<b>COARSE</b>		
M2.2x0.45	2087-2.2	2093-2.2
M2.5x0.45	2087-2.5	2093-2.5
M3x0.5	2087-3	2093-3
M3.5x0.6	2087-3.5	2093-3.5
M4x0.7	2087-4	2093-4
M5x0.8	2087-5	2093-5
M6x1	2087-6	2093-6
M7x1	2087-7	2093-7
M8x1.25	2087-8	2093-8
M10x1.5	2087-10	2093-10
M12x1.75	2087-12	2093-12
M14x2	2087-14	2093-14
M16x2	2087-16	2093-16
M18x2.5	2087-18	2093-18
M20x2.5	2087-20	2093-20
<b>FINE</b>		
M8X1	4984-8	4986-8
M10X1	4984-10	4986-10
M10X1.25	4944-10	4945-10
M12X1.25	4944-12	4945-12
M12X1.5	4976-12	4977-12
M14X1.5	4976-14	4977-14
M16X1.5	4976-16	4977-16
M18X1.5	4976-18	4977-18

## SPARK PLUG TAPS

Thread Size	Reach	Tap Part No.
10-1.0mm	1/2"	1030-10
12-1.25mm	1/2"	1030-12
12-1.25mm	3/4"	1030-12
14-1.25mm	3/8"	1030-14
	7/16"	
	1/2"	
	3/4"	
18-1.50mm	1/2"	1030-18
	7/8-18	549
7/8-18	5/8"	549

## PIPE THREAD TAPS

(for Taper Pipe Threads)

Nominal Thread Size	Part No.	Nominal Thread Size	Part No.
1/8-27	328-2	1/2-14	328-8
1/4-18	328-4	3/4-14	328-12
3/8-18	328-6	1-11-1/2	328-16

# Emhart Aftermarket Products



## HeliCoil

Thread Repair Inserts



## POP<sup>®</sup>

Blind Rivets and Tools



## DRILL-OUT<sup>®</sup>

Broken Bolt & Stud Extractors

## Chase'em Back<sup>™</sup>

Stud Repair Sets



# Emhart Aftermarket Products

## Heli-Coil

Did you know...

Indy and NASCAR racing teams use Heli-Coil inserts.

A Boeing 747 has 250,000 Heli-Coil inserts as original equipment

There are 250,000 Heli-Coil inserts in every space shuttle.

### Why?

All the above use lightweight, exotic materials and need strong threads.

### What does this mean to you?

Today's cars are also made of light materials, such as aluminum, and tapped hole damage is a common occurrence. Stripping during removal of seized bolts, cross-threading and wear from constant assembly and disassembly and corrosion can also cause thread damage. For these reasons companies like General Motors, Ford, Chrysler, Boeing, Pratt & Whitney, McDonnell-Douglas, NASA, Harley-Davidson, Caterpillar, Cummins, General Electric, Rolls-Royce, BMW, Porsche and many more, including the military, all use Heli-Coil inserts as original equipment in critical threaded areas of parts made of lightweight materials. They have found that the use of Heli-Coil inserts gives them a stronger and more reusable thread that resists the effects of corrosion.

The inserts offered in all of our Heli-Coil Thread Repair Kits are made of the same high quality stainless steel as the inserts used by these companies. The same technology that took us to the moon is available to fix the damaged threads on your car, truck, motorcycle, boat; anywhere they happen. This repair is better than the original thread. It is quick, easy, permanent and in almost all cases less expensive than replacing the part.

## POP

POP Blind Rivets are available in a variety of sizes, types and materials combined with dome, countersunk or large-flange head styles. This makes POP blind rivets ideal for a wide range of riveting applications. They are the most popular rivets for automotive use. Also available from POP are Sheet Metal Inserts, a general purpose threaded insert with exceptionally strong torque-out and pull-out characteristics, POP Plastic Rivets, a one-piece, all-plastic expansion rivet, POP WELL-NUT Threaded Inserts, a flanged rubber bushing with brass threads molded into one end, and a variety of manual and power tools.

## Drill-Out

Drill-Out is a drill bit and extractor in one. The drill bit is made from high quality tool steel that has been hardened and tempered giving it the ability to even drill into Grade 8 and stainless steel bolts. The extractor is made from hard, flexible die steel which allows it to bite into any bolt or stud without slipping or stripping.

## Chase 'em Back™

The unique, patented hinge design of Chase 'em Back allows for the repair of damaged or corroded threads on most studs by attaching to the undamaged threads and working back through the damaged areas. Made from heat-treated steel, sets are available for the most common inch and metric thread sizes. Other sets include the 8-piece Sav-A-Stud Plus™ set for wheel stud repair and the 20-piece Spindle-Saver™ set for front wheel drive spindle repair.

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HELI-COIL

POP

DRILL-OUT

CHASE 'EM BACK

# Product Portfolio

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**Heli-Coil** Products are manufactured to the same exacting quality systems required by the military, aerospace and automotive standards. The Danbury manufacturing facility has been certified ISO 9001 and QS 9000. We are committed to an ongoing and never ending process of quality improvement and total customer satisfaction.

**Heli-Coil®** – the most effective and universally accepted method of thread repair. Restores damaged threads to better than new condition. Available in a range of inch and metric thread sizes.

## Heli-Coil Product Assortment

- Thread Kits
  - Inch & Metric
- Master Thread Repair Sets
  - Inch
  - Metric
  - Spark Plug
  - Sav-A-Thread
- Special Application Kits
  - Oxygen Sensor
  - Motorcycle
  - Pipe Thread
  - Recessed Spark Plug
- Packaged Inserts
- Bulk Inserts
- Point-of-Purchase Displays
- Drill-Out
  - Kits
  - Sets
  - Displays

**POP®** Blind Rivet Systems – a high tech fastening system. Ideal for structural repairs, body and collision work and more. Rivets are available in various materials, types, sizes and styles for all types of fastening.

## POP Product Assortment

- Point-of-Purchase Displays
- Bulk Rivets Assortments
  - 100 Piece Box
  - 500 Piece Box
- Thrift Packs
- Nosepieces & Jaws
- Rivetools
  - Manual
  - Power
- Plastic Rivets
- Sheet Metal Inserts
- WELL-NUT Inserts

**Drill-Out®** – a drill bit and extractor in one. The drill bit is made from high quality tool steel that has been hardened and tempered giving it the ability to even drill into Grade 8 steel bolts. The extractor is made from hard, flexible die steel which allows it to bite into any bolt or stud without slipping or stripping.

## Drill-Out Product Assortment

- Point-of-Purchase Displays
- 4-Piece Kits
- Individual tools

## Chase 'em Back™

Four different sets available for common stud repair applications.

- Chase 'em Back
- Sav-A-Stud Plus
- Sav-A-Stud Plus-HD
- Spindle Saver



# The Heli-Coil Thread Repair System

Heli-Coil has the most effective and universally accepted method of thread repair. Heli-Coil inserts quickly and permanently restore **stripped, worn or damaged threads** to their original size and condition.

The inserts work in any part or material; **aluminum, magnesium, cast iron, bronze**, etc. The use of light weight (and soft) materials in fuel efficient cars means more thread damage...there is a Heli-Coil insert to repair virtually every application.

Damaged threads can be restored to better than new condition in spark plug ports, carburetor fuel inlets, transmission housings, oil drain plugs, exhaust and intake manifolds, head

bolt holes, brake calipers and more! The Heli-Coil system makes all other thread repair methods obsolete: welding, plugging, oversized fasteners and oversized drilling of mating parts. It's faster – you save time, increase your shop's repair capabilities and restore parts that otherwise would have to be scrapped.

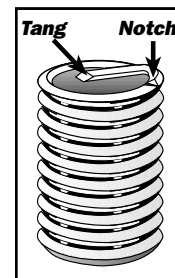


Heli-Coil repairs are available in the following standard thread series and size ranges: **Inch Coarse** (#8 thru 1-1/2), **Inch Fine** (#10 thru 1-1/2), **Metric Coarse** (M3 thru M20), **Metric Fine** (M8 thru M18), **Spark Plug** (10mm, 12mm, 14mm, 18mm & 7/8"), and **Pipe Thread** (1/8" thru 1").

In addition to the above, custom sizes are available for various repairs.

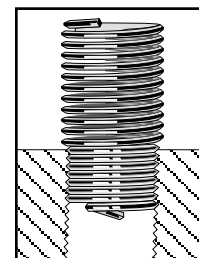
## Heli-Coil Stainless Steel Inserts

Heli-Coil inserts are precision formed coils of extremely hard stainless steel (18-8) diamond shaped wire. When installed into a Heli-Coil tapped hole, the insert provides permanent conventional screw threads. The insert has a driving "tang" for installation which is notched for easy removal.



## The Retention Principle

Heli-Coil inserts are larger in diameter before installation than the tapped hole. During installation, the inserting tool reduces the diameter of the leading coil so it can enter the tapped hole. After the installation, each high tensile stainless steel coil expands outward against the tapped hole to permanently anchor the insert.



## Installation

### Drill

Drill out the damaged threads using the drill size specified on the kit or set. Drill to sufficient depth to accommodate the insert length and bolt or screw being used.



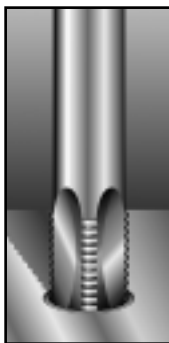
### Install

Use the installation tool supplied in the kit or set. Just wind the insert into the hole until the top coil is 1/4 - 1/2 turn into the tapped thread. Now you're back to the original size and the original size fastener can be used.



### Tap

Use the Heli-Coil tap supplied in the kit or set. Check the size on the shank to make sure you have the right one. Tap the hole to sufficient depth to accommodate the insert length and bolt or screw being used.

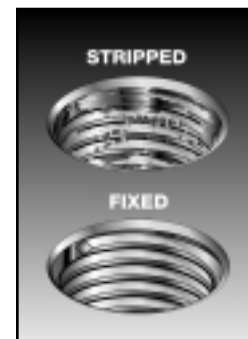


### Tang Removal

The tang must be removed to allow full passage of the bolt or screw through the insert. Place square (unchamfered) end of a punch on the tang and strike sharply. For inserts over 1/2", M14 and up, and all spark plug sizes, use long nose pliers. Holding the tang with the pliers, bend it alternately in and out until it comes free. **Note:** For **Spark Plug** repairs, **NO** drilling is necessary. The Heli-Coil spark plug kit contains a piloted reamer tap. With this tap, the damaged threads are removed and new threads are cut in one continuous operation.

## Stripped & Fixed

When threads become stripped, worn or damaged for any reason, the strength and reliability are greatly reduced. Potentially dangerous situations are eliminated when the damaged thread is repaired with Heli-Coil inserts. The Heli-Coil threaded insert provides stronger, more reliable threads than the original tapped hole and at the same time eliminates the possibility of thread wear, corrosion, galling, seizing and rust.



# Inch Thread Repair Kits

Heli-Coil has complete coverage of inch thread repair sizes. Available from stock are Inch Coarse kits in sizes #8 through 1-1/2" and Inch Fine kits in

sizes #10 through 1-1/2". Kits up to 3/4" are packaged in durable placon or vinyl pouches, and kits 7/8" and larger are packaged in sturdy metal cases and

contain the proper size high speed steel drill. All kits contain a Heli-Coil tap, installation tool, a quantity of inserts and detailed instructions.

<b>INCH COARSE</b>				<b>Kit Contents and Replacement Parts</b>					<b>DRILL SIZE</b>
<b>THREAD SIZE + LENGTH</b>	<b>KIT PART NO.</b>	<b>KIT PKG. TYPE</b>	<b>INSERTS PER KIT</b>	<b>TAP PART NO.</b>	<b>INSTALLATION TOOL PART NO.</b>	<b>TOOL TYPE</b>	<b>PACKAGED INSERT PART NO.</b>	<b>PACKAGED INSERT QTY.</b>	
8-32 x .246	5521-2	A	12	819-2	2288-2	2	R1185-2	12	11/64
10-24 x .285	5521-3	A	12	819-3	2288-3	2	R1185-3	12	13/64
12-24 x .324	5521-1	A	12	819-1	2288-1	2	R1185-1	12	15/64
1/4-20 x .375*	5521-4	A	12	819-4	5288-4	1	R1185-4	12	17/64
5/16-18 x .469*	5521-5	A	12	819-5	5288-5	1	R1185-5	12	21/64
3/8-16 x .562*	5521-6	A	12	819-6	5288-6	1	R1185-6	12	25/64
7/16-14 x .656*	5521-7	A	6	819-7	5288-7	1	R1185-7	6	29/64
1/2-13 x .750*	5521-8	A	6	819-8	5288-8	1	R1185-8	6	17/32
9/16-12 x .844	5521-9	B	6	819-9	2288-9	2	R1185-9	6	19/32
5/8-11 x .938	5521-10	B	6	819-10	5288-10	1	R1185-10	6	21/32
3/4-10 x 1.125	5521-12	B	4	819-12	2288-12	2	R1185-12	4	25/32
<b>THE FOLLOWING KITS COME COMPLETE WITH HIGH SPEED STEEL DRILL BIT FOR 1/2" CHUCK.</b>									
7/8-9 x 1.312	5521-14	C	6	8187-14	3724-14	2	K1185-14	1	29/32
1-8 x 1.500	5521-16	C	6	8187-16	3724-16	2	K1185-16	1	1-1/32
1-1/8-7 x 1.688	5521-18	C	5	8187-18	3724-18	2	K1185-18	1	1-5/32
1-1/4-7 x 1.875	5521-20	C	4	8187-20	3724-20	2	K1185-20	1	1-9/32
1-3/8-6 x 2.062	5521-22	C	4	8187-22	3724-22	2	K1185-22	1	1-13/32
1-1/2-6 x 2.250	5521-24	C	4	8187-24	3724-24	2	K1185-24	1	1-17/32

\*Sizes included in Master Thread Repair Set - Part No. 5621



<b>INCH FINE</b>				<b>Kit Contents and Replacement Parts</b>					<b>DRILL SIZE</b>
<b>THREAD SIZE + LENGTH</b>	<b>KIT PART NO.</b>	<b>KIT PKG. TYPE</b>	<b>INSERTS PER KIT</b>	<b>TAP PART NO.</b>	<b>INSTALLATION TOOL PART NO.</b>	<b>TOOL TYPE</b>	<b>PACKAGED INSERT PART NO.</b>	<b>PACKAGED INSERT QTY.</b>	
10-32 x .285**	5528-3	A	12	821-3	2299-3	3	R1191-3	12	13/64
1/4-28 x .375**	5528-4	A	12	821-4	2299-4	3	R1191-4	12	17/64
5/16-24 x .469**	5528-5	A	12	821-5	6299-5	3	R1191-5	12	21/64
3/8-24 x .562**	5528-6	A	12	821-6	6299-6	3	R1191-6	12	25/64
7/16-20 x .656**	5528-7	A	6	821-7	6299-7	3	R1191-7	6	29/64
1/2-20 x .750**	5528-8	A	6	821-8	6299-8	3	R1191-8	6	33/64
9/16-18 x .844	5528-9	B	6	821-9	2299-9	3	R1191-9	6	37/64
5/8-18 x .938	5528-10	B	6	821-10	2299-10	3	R1191-10	6	41/64
3/4-16 x 1.125	5528-12	B	4	821-12	2299-12	3	R1191-12	4	49/64
<b>THE FOLLOWING KITS COME COMPLETE WITH HIGH SPEED STEEL DRILL BIT FOR 1/2" CHUCK.</b>									
7/8-14 x 1.312	5528-14	C	6	8193-14	535-14	4	K1191-14	1	57/64
1-14 x 1.500	5528-16	C	6	8193-16	535-16	4	K1191-16	1	1-1/64
1-12 x 1.500	5528-161	C	6	8193-161	535-161	4	K1191-161	1	1-1/64
1-1/8-12 x 1.688	5528-18	C	5	8193-18	535-18	4	K1191-18	1	1-5/32
1-1/4-12 x 1.875	5528-20	C	4	8193-20	535-20	4	K1191-20	1	1-9/32
1-3/8-12 x 2.062	5528-22	C	4	8193-22	535-22	4	K1191-22	1	1-13/32
1-1/2-12 x 2.250	5528-24	C	4	8193-24	535-24	4	K1191-24	1	1-17/32

\*Sizes included in Master Thread Repair Set - Part No. 5621

# Metric Thread Repair Kits

Heli-Coil has all you need in metric thread repair items. Available from stock are Metric Coarse kits in sizes M3 through M20 and Metric Fine kits in

sizes M8 through M20. All Metric kits contain a Heli-Coil tap, installation tool, a quantity of inserts and complete instructions.

METRIC COARSE				Kit Contents and Replacement Parts					DRILL SIZE
THREAD SIZE + LENGTH	KIT PART NO.	KIT PKG. TYPE	INSERTS PER KIT	TAP PART NO.	INSTALLATION TOOL PART NO.	TOOL TYPE	PACKAGED INSERT PART NO.	PACKAGED INSERT QTY.	
M3x0.5 x 4.5mm	5546-3	B	12	2087-3	7751-3	5	R1084-3	12	1/8
M4x0.7 x 6.0mm	5546-4	A	12	2087-4	3747-4	3	R1084-4	12	11/64
M5x0.8 x 7.5mm*†	5546-5	A	12	570-5	3747-5	3	R1084-5	12	13/64
M6x1 x 9.0mm*†	5546-6	A	12	570-6	3747-6	3	R1084-6	12	1/4
M7x1 x 10.5mm	5546-7	A	12	570-7	3747-7	2	R1084-7	12	9/32
M8x1.25 x 12.0mm*†	5546-8	A	12	570-8	8747-8	2	R1084-8	12	21/64
M9x1.25 x 13.5mm	5546-9	A	12	570-9	8747-9	2	R1084-9	12	23/64
M10x1.5 x 15.0mm*	5546-10	A	12	570-10	8747-10	2	R1084-10	12	13/32
M11x1.5 x 16.5mm	5546-11	A	6	580-11	8747-11	3	R1084-11	6	29/64
M12x1.75 x 18.0mm	5546-12	A	6	2087-12	8747-12	2	R1084-12	6	31/64
M14x2 x 21.0mm	5546-14	B	6	2087-14	3747-14	2	R1084-14	6	37/64
M16x2 x 24.0mm	5546-16	B	6	2087-16	3747-16	2	R1084-16	6	21/32
M18x2.5 x 27.0mm	5546-18	B	6	2087-18	3747-18	2	R1084-18	6	47/64
M20x2.5 x 30.0mm	5546-20	B	4	2087-20	3747-20	2	R1084-20	4	13/16

\*Sizes included in Master Thread Repair Set - Part No. 5626-150

†Sizes included in Master Thread Repair Set - Part No. 5626-125

A - Carded

B - Pouch



METRIC FINE				Kit Contents and Replacement Parts					DRILL SIZE
THREAD SIZE + LENGTH	KIT PART NO.	KIT PKG. TYPE	INSERTS PER KIT	TAP PART NO.	INSTALLATION TOOL PART NO.	TOOL TYPE	PACKAGED INSERT PART NO.	PACKAGED INSERT QTY.	
M8x1 x 12.0mm	5542-8	A	12	573-8	4835-8	3	R4255-8	12	21/64
M10x1 x 15.0mm	5542-10	A	12	573-10	4835-10	3	R4255-10	12	13/32
M11x1 x 16.5mm	5542-11	A	6	573-11	4835-11	3	R4255-11	6	7/16
M10x1.25 x 15.0mm†	5543-10	A	12	575-10	8640-10	3	R4649-10	12	13/32
M11x1.25 x 16.5mm	5543-11	A	6	4944-11	8640-11	3	R4649-11	6	29/64
M12x1.25 x 18.0mm	5543-12	A	6	4944-12	4640-12	3	R4649-12	6	31/64
M12x1.5 x 18.0mm	5544-12	A	6	4976-12	8973-12	3	R3745-12	6	31/64
M14x1.5 x 21.0mm	5544-14	B	6	4976-14	4973-14	3	R3745-14	6	9/16
M16x1.5 x 24.0mm	5544-16	B	6	4976-16	4973-16	3	R3745-16	6	21/32

†Sizes included in Master Thread Repair Set - Part No. 5626-125

# Master Thread Repair Sets

These “Shop Sets” are the professional’s choice and are available in inch and metric — coarse and fine. The inch and metric Master Sets contain the most common thread repair sizes. All of these master sets come complete with a drill, tap, installation tool and a quantity of inserts for each size and complete instructions.



## Inch Master Thread Repair Sets

There are two master sets for inch sizes. The coarse set contains five sizes: 1/4, 5/16, 3/8, 7/16 and 1/2. The fine set has six sizes: #10, 1/4, 5/16, 3/8, 7/16 and 1/2.

THREAD SIZE + LENGTH	PACKAGED INSERT PART NO.	INSERT QUANTITY	TAP PART NO.	INSTALLATION TOOL PART NO.	DRILL SIZE
<b>PART NO. 5621 – INCH COARSE CONTENTS</b>					
1/4-20 x .375	R1185-4	12	819-4	5288-4	17/64
5/16-18 x .469	R1185-5	12	819-5	5288-5	21/64
3/8-16 x .562	R1185-6	12	819-6	5288-6	25/64
7/16-14 x .656	R1185-7	6	819-7	5288-7	29/64
1/2-13 x .750	R1185-8	6	819-8	5288-8	17/32
<b>PART NO. 5625 – INCH FINE CONTENTS</b>					
10-32 x .285	R1191-3	12	821-3	2299-3	13/64
1/4-28 x .375	R1191-4	12	821-4	2299-4	17/64
5/16-24 x .469	R1191-5	12	821-5	2299-5	21/64
3/8-24 x .562	R1191-6	12	821-6	2299-6	25/64
7/16-20 x .656	R1191-7	6	821-7	2299-7	29/64
1/2-20 x .750	R1191-8	6	821-8	2299-8	33/64

## Metric Master Thread Repair Sets

Two sets are available in metric sizes. The metric coarse set contains sizes M5, M6, M8 and M10x1.5 and the metric fine set contains sizes M5, M6, M8 and M10x1.25.

THREAD SIZE + LENGTH	PACKAGED INSERT PART NO.	INSERT QUANTITY	TAP PART NO.	INSTALLATION TOOL PART NO.	DRILL SIZE
<b>PART NO. 5626-150 – METRIC COARSE CONTENTS</b>					
M5x0.8 x 7.5mm	R1084-5	12	570-5	3747-5	13/64
M6x1 x 9.0mm	R1084-6	12	570-6	3747-6	1/4
M8x1.25 x 12.0mm	R1084-8	12	570-8	8747-8	21/64
M10x1.5 x 15.0mm	R1084-10	12	570-10	8747-10	13/32
<b>PART NO. 5626-125 – METRIC FINE CONTENTS</b>					
M5x0.8 x 7.5mm	R1084-5	12	570-5	3747-5	13/64
M6x1 x 9.0mm	R1084-6	12	570-6	3747-6	1/4
M8x1.25 x 12.0mm	R1084-8	12	570-8	3747-8	21/64
M10x1.25 x 15.0mm	R4649-10	12	575-10	8640-10	13/32





# Spark Plug & Sav-A-Thread



## Spark Plug

Heli-Coil is the original spark plug port thread repair. These kits offer the highest quality and most durable repair available. They are the first choice of professional mechanics and engine rebuilders. Kits are available in sizes M10, M12, M14, M18, and 7/8". Each kit contains a piloted reamer tap (no drilling necessary), an installation tool, and a quantity of inserts. The M12 and M14 kits contain several insert lengths to accommodate

all spark plug reaches. Heli-Coil Spark Plug Inserts are the preferred method of repair specified by virtually all U.S. and foreign vehicle manufacturers.

**NOTE:** Do **NOT** use Heli-Coil wire inserts to repair taper seat spark plug ports.

THREAD SIZE	REACH	KIT PART NO.	INSERTS PER KIT	Kit Contents and Replacement Parts			
				TAP PART NO.	INSTALLATION TOOL PART NO.	INSERT PKG. PART NO.	INSERT QUANTITY
10-1.0mm	1/2"	5523-10	24	1030-10	4971-10	R474-4	6
12-1.25mm	1/2"	5523-12	12	1030-12	4971-12	R482-1	6
	3/4"		R482-2			6	
14-1.25mm	3/8"	5523-14	6	1030-14	4971-14	R512	6
	7/16"		6			R513	6
	1/2"		6			R513-13	6
	3/4"		6			R513-10	6
	.472		6			R513-20	6
18-1.50mm	1/2"	5523-18	24	1030-18	4971-18	R514-6	6
7/8-18	1/2"-5/8"	550	10	549	548	K518-12	5

## Sav-A-Thread

Sav-A-Thread is the easiest way to permanently repair stripped spark plug hole threads. Virtually all engines built today have aluminum cylinder heads. Combining this with the growing number of do-it-yourselfers and the need for quick, easy, on-the-spot repairs makes Sav-A-Thread a must for every store and shop.

**NOTE:** Heli-Coil recommends removing the head before installation to insure chips do not enter cylinder.

- Three insert lengths are available to accommodate all spark plug reaches.
- Positive mechanical locking feature means the insert will never come out!
- The piloted reamer tap means no drilling is necessary and perfect alignment of the tapped hole.
- Available in kit or set for the do-it-yourselfer and professional engine rebuilder.



Complete Kits				Kit Contents and Replacement Parts				
SIZE	KIT PART NO.	REACH	INSERTS PER KIT	TAP PART NO.	TOOL PART NO.	REACH	INSERT PKG. PART NO.	INS. QTY.
M14x1.25	5334-14	Short	1	5329-14	5332-14	Short	R5326-14S	1
		Normal	1			Normal	R5326-14N	1
		Long	1			Long	R5326-14L	1
M14x1.25	5408-14	Short	6	5329-14	5332-14	Short	R5326-14S-6	6
		Normal	6			Normal	R5326-14N-6	6
		Long	6			Long	R5326-14L-6	6
M14x1.25	5409-14	Extended	-	5329-14-1	5332-14-1	Extended Reach		

# Special Applications

## Custom Kits

Custom application kits round out the complete line of Heli-Coil Thread Repair Kits. They are recommended by both domestic and foreign automakers and include kits for carburetors, various heavy duty applications, and several specially designed repairs for a number of Volkswagen models.

All kits contain a Heli-Coil tap, installation tool, a quantity of inserts, and detailed instructions. The American Bosch kit and Detroit Diesel kit also include high speed steel drill bits.

## Motorcycle

Heli-Coil offers a complete range of kits and sets for the repair of damaged threads on motorcycles. The Heli-Coil Motorcycle Thread Repair Set contains M6, M8 and M10 sizes. Two lengths of M10 inserts are available: 15mm for most repairs and 25mm for head bolt repairs.

Also available are special sizes for specific Harley Davidson applications. All kits come with tap, installation tool, a quantity of inserts and complete instructions.



## Pipe Thread Kits

Heli-Coil Pipe Thread Kits are available in a complete range of sizes for the most often occurring taper pipe thread failures, such as exhaust pipes on small engines. Each kit contains a high speed steel drill, tap, installation tool, a quantity of inserts, and complete instructions.

## Oxygen Sensor Thread Repair Kit – Part No. 4833

Quickly and permanently restore damaged M18 x 1.5 oxygen sensor threads in exhaust manifolds with this kit. No drilling is necessary with the piloted reamer tap, resulting in perfect alignment of the new tapped hole. Corrosion resistant stainless steel inserts improve future serviceability. This application is easy to use, works in minutes, and eliminates exhaust manifold replacement. Perfect for the professional engine rebuilder and the do-it-yourselfer.



## Sav-A-Thread® Quick Thread Repair

No special tools or taps are required with this kit. Works with standard drill and taps. Inserts are made of carbon steel for strength and durability and zinc plated to resist corrosion. The locking pin aligns in insert slot and

broaches threads in parent material.

The pin breaks off easily for flush, clean repair, and the insert locks into place automatically for a permanent installation.



### Kit Contents and replacement parts

Thread Size	Insert Length	External Thread Size	Drill Size	Tap Size	Inserts Per Kit	Part No.
<b>INCH COARSE PACKAGED INSERTS</b>						
6-32	.312"	5/16-18	17/64	5/16-18	10	20203
8-32	.312"	5/16-18	17/64	5/16-18	10	20205
10-24	.312"	5/16-18	17/64	5/16-18	10	20207
1/4-20	.375"	3/8-16	21/64	3/8-16	8	20211
5/16-18	.437"	7/16-14	"W"	7/16-14	8	20213
3/8-16	.500"	1/2-13	29/64	1/2-13	6	20215
7/16-14	.562"	9/16-12	33/64	9/16-12	6	20217
1/2-13	.625"	5/8-18	37/64	5/8-18	6	20219
<b>INCH FINE PACKAGED INSERTS</b>						
10-32	.312"	5/16-18	17/64	5/16-18	10	20208
1/4-28	.375"	3/8-16	21/64	3/8-16	8	20212
5/16-24	.437"	7/16-14	"W"	7/16-14	8	20214
3/8-24	.500"	1/2-13	29/64	1/2-13	6	20216
7/16-20	.562"	9/16-12	33/64	9/16-12	6	20218
1/2-20	.625"	5/8-18	37/64	5/8-18	6	20220
<b>METRIC PACKAGED INSERTS</b>						
M6X1	.375"	3/8-16	21/64	3/8-16	8	20504
M8X1.25	.500"	1/2-13	29/64	1/2-13	6	20506
M10X1.5	.562"	9/16-12	33/64	9/16-12	6	20508
M12X1.75	.625"	5/8-18	37/64	5/8-18	6	20511

# Applications Guide

## TYPICAL AUTOMOTIVE APPLICATIONS

SIZE	HELI-COIL KIT PART NO.
<b>Oil &amp; Transmission Pan Screws</b>	
1/4-20	5521-4
5/16-18	5521-5
<b>Cylinder Head Bolts</b>	
7/16-14	5521-7
1/2-13	5521-8
9/16-12	5521-9
M10x1.5	5546-10
M11x1.5	5546-11
M11x1.25	5543-11
M12x1.75	5546-12
<b>Exhaust Manifold Studs</b>	
1/4-20	5521-4
1/4-28	5528-4
5/16-18	5521-5
5/16-24	5528-5
3/8-16	5521-6
3/8-24	5528-6
7/16-14	5521-7
7/16-20	5528-7
1/2-20	5528-8
9/16-18	5528-9
5/8-18	5528-10
3/4-10	5521-12
M5x0.8	5546-5
M6x1	5546-6
M8x1.25	5546-8
M10x1.5	5546-10
M10x1.25	5543-10
<b>Starter Bolts</b>	
3/8-16	5521-6
M10x1.5	5546-10
<b>Alternator Bolts</b>	
5/16-18	5521-5
3/8-16	5521-6
M10x1.5	5546-10
<b>Drain Plugs</b>	
1/2-20	5528-8
5/8-18	5528-10
3/4-16	5528-12
7/8-14	5528-14
M12x1.75	5546-12
M14x1.5	5544-14
M16x1.5	5544-16
<b>Brake Caliper Bolts</b>	
M9x1.25	5546-9
M11x1.25	5543-11

## TYPICAL HEAVY DUTY APPLICATIONS

SIZE	HELI-COIL KIT PART NO.
<b>Aux. Transmission Cases (Fuller)</b>	
3/8-16	5521-6
5/16-18	5521-5
<b>Caterpillar Flywheel Bolts</b>	
3/4-16	5528-12
<b>Cummins Head Bolt</b>	
11/16-16	5559-11
<b>Caterpillar Pre-Combustion Chamber</b>	
3/4-12	4922-12
7/8-12	4922-141
1-12	4922-161
1 1/8-12	4922-18
1 1/4-12	4922-20
<b>Wheel Studs</b>	
3/4-10	5521-12
3/4-16	5528-12
<b>Motor Mounts/Bell Housing</b>	
1/2-13	5521-8
5/8-11	5521-10
<b>Oil Pan</b>	
7/16-14	5521-7
<b>Intake Manifolds</b>	
3/8-16	5521-6
<b>After Coolers</b>	
5/16-18	5521-5
<b>Valve Cover</b>	
3/8-16	5521-6
<b>Detroit Diesel Series "92" Block Head Bolt/Main Bearing</b>	
11/16-11	5575-11
<b>Mack-Scania Head Bolt</b>	
M14x1.5	5544-14
<b>American Bosch APE Diesel Fuel Pumps</b>	
1/4-20	5401-4-1-SL

## SPARK PLUG HOLE THREADS

SIZE	HELI-COIL KIT PART NO.
<b>Wire Insert*</b>	
10-1.0mm	5523-10
12-1.25mm	5523-12
14-1.25mm	5523-14
18-1.5mm	5523-18
7/8-18	550
<b>Sav-A-Thread**</b>	
M14x1.25	5334-14 or 5408-14 5409-14

\*For gasket type spark plug assemblies only.

\*\*For Taper seat or gasket type spark plug assemblies.

## TYPICAL MOTORCYCLE APPLICATIONS

SIZE	HELI-COIL KIT PART NO.
<b>Motorcycle Thread Repair Set</b>	
M6x1, M8x1.25 and M10x1.25 (2 lengths)	4650
<b>Cam Screw Cover, Tappet Guide, Oil Pump Stud and Timer Mounting</b>	
1/4-24	5540-4
<b>Front/Rear Brake Drum</b>	
3/8-20	5540-6
<b>Head Bolt</b>	
7/16-16	5540-7
<b>Drain Plug - Engine and Transmission</b>	
1/2-13	5521-8-2
<b>Drain Plug - Chain Case</b>	
1/2-20	5528-8-2
<b>Timing Plug</b>	
5/8-18	5528-10-2
<b>Generator Case Bolt</b>	
5/16-18	5521-5-2
<b>Transmission Cover</b>	
5/16-18	5521-5-3
<b>Japanese Motorcycle Head Bolt</b>	
M10x1.25	4647-10-1

## TYPICAL VOLKSWAGEN APPLICATIONS

SIZE	HELI-COIL KIT PART NO.
<b>VW Electro Magnetic</b>	
M8x1	5542-8-1
<b>Fuel Cut Off Jet</b>	
M11x1	5542-11-1
<b>VW Rabbit Head Bolt Threads</b>	
M11x1.25	5546-11-5
<b>VW Fuel Injection Head Sensor</b>	
M10x1	5542-10-1

## PIPE THREAD KITS

SIZE	HELI-COIL KIT PART NO.
1/8-27	5407-2
1/4-18	5407-4
3/8-18	5407-6
1/2-14	5407-8
3/4-14	5407-12
1-11 1/2	5407-16

# Packaged Inserts & Tooling



Heli-Coil inserts are packaged according to thread size for easy handling and display. The inserts are con-

tained in a sturdy, clear, plastic display box and marked with part number and thread size. The length of the inserts in inch and metric packages is 1-1/2 times the diameter of the bolt. This provides sufficient strength in most applications. Spark plug hole inserts are packaged in lengths corresponding to the various spark plug reaches. For shorter or longer lengths and volume applications, see page 13.

Thread Size + Length	Packaged Insert Part No.	Insert Qty.
<b>INCH COARSE</b>		
8-32x.246	R1185-2	12
10-24x.285	R1185-3	12
12-24x.324	R1185-1	12
1/4-20x.375	R1185-4	12
5/16-18x.469	R1185-5	12
3/8-16x.562	R1185-6	12
7/16-14x.656	R1185-7	6
1/2-13x.750	R1185-8	6
9/16-12x.844	R1185-9	6
5/8-11x.938	R1185-10	6
3/4-10x1.125	R1185-12	4
7/8-9x1.312	K1185-14	1
1-8x1.500	K1185-16	1
1-1/8-7x1.688	K1185-18	1
1-1/4-7x1.875	K1185-20	1
1-3/8-6x2.062	K1185-22	1
1-1/2-6x2.250	K1185-24	1
<b>INCH FINE</b>		
10-32x.285	R1191-3	12
1/4-28x.375	R1191-4	12
5/16-24x.469	R1191-5	12
3/8-24x.562	R1191-6	12
7/16-20x.656	R1191-7	6
1/2-20x.750	R1191-8	6
9/16-18x.844	R1191-9	6
5/8-18x.938	R1191-10	6
3/4-16x1.125	R1191-12	4
7/8-14x1.312	K1191-14	1
1-14x1.500	K1191-16	1
1-12x1.500	K1191-161	1
1-1/8-12x1.688	K1191-18	1
1-1/4-12x1.875	K1191-20	1
1-3/8-12x2.062	K1191-22	1
1-1/2-12x2.250	K1191-24	1

Thread Size	Length	Packaged Insert Part No.	Insert Qty.
<b>METRIC COARSE</b>			
M3x0.5	4.5	R1084-3	12
M4x0.7	6.0	R1084-4	12
M5x0.8	7.5	R1084-5	12
M6x1	9.0	R1084-6	12
M7x1	10.5	R1084-7	12
M8x1.25	12.0	R1084-8	12
M9x1.25	13.5	R1084-9	12
M10x1.5	15.0	R1084-10	12
M12x1.75	18.0	R1084-12	6
M14x2	21.0	R1084-14	6
M16x2	24.0	R1084-16	6
M18x2.5	27.0	R1084-18	6
M20x2.5	30.0	R1084-20	4

Thread Size	Length	Packaged Insert Part No.	Insert Qty.
<b>METRIC FINE</b>			
M8x1	8.0	R4255-8-10	12
M10x1	15.0	R4255-10	12
M10x1.25	15.0	R4649-10	12
M11x1	11.0	R4255-11-10	6
M11x1.25	16.5	R4649-11	6
M12x1.25	18.0	R4649-12	6
M12x1.5	18.0	R3745-12	6
M14x1.5	21.0	R3745-14	6
M16x1.5	24.0	R3745-16	6

## Spark Plug Sav-A-Thread Inserts

Thread Size	Reach	Packaged Insert Part No.	Insert Qty.
M14x1.25	Short	R5326-14S	1
M14x1.25	Normal	R5326-14N	1
M14x1.25	Long	R5326-14L	1

## SAV-A-THREAD PRO SET

Thread Size	Reach	Packaged Insert Part No.	Insert Qty.
M14x1.25	Short	R5326-14S-6	6
M14X1.25	Normal	R5326-14N-6	6
M14X1.25	Long	R5326-14L-6	6

## Spark Plug – Wire Inserts

Thread Size	Reach	Packaged Insert Part No.	Insert Qty.
10-1.0mm	1/2"	R474-4	6
12-1.25mm	1/2"	R482-1	6
	3/4"	R482-2	6
14-1.25mm	3/8"	R512	6
	7/16"	R513	6
	1/2"	R513-13	6
	3/4"	R513-10	6
	.472	R513-20	6
	18-1.5mm	1/2"	R514-6
7/8"	1/2"-5/8"	R518-12	5

There are two types of industrial installation tools available:

1. **Steel kit tools** for 1/4, 5/16, 3/8, 7/16, 1/2 and 5/8 coarse thread sizes which can be used for medium production quantities.
2. **Prewinder type** installation tools for higher production quantities.



## Prewinder Type Tools

Size	Part No.	Size	Part No.
<b>INCH COARSE</b>		<b>INCH FINE</b>	
8-32	7551-2	10-32	7552-3
10-24	7551-3	1/4-28	7552-4
12-24	7551-1	5/16-24	7552-5
1/4-20	7551-4	3/8-24	7552-6
5/16-18	7551-5	7/16-20	7552-7
3/8-16	7551-6	1/2-20	7552-8
7/16-14	7551-7	9/16-18	535-9
1/2-13	7551-8	5/8-18	535-10
9/16-12*	3724-9	3/4-16	535-12
5/8-11*	3724-10		
3/4-10*	3724-12		

Size	Part No.	Size	Part No.
<b>METRIC COARSE</b>		<b>METRIC FINE</b>	
M3x0.5	7751-3	M8x1	7755-8
M4x0.7	7751-4	M10x1	7755-10
M5x0.8	7751-5	M10x1.25	7756-10
M6x1	7751-6	M12x1.25	7756-12
M7x1	7751-7	M12x1.5	7753-12
M8x1.25	7751-8	M14x1.5	7753-14
M10x1.5	7751-10	M16x1.5	7753-16
M12x1.75	7751-12	M18x1.5	7753-18
M14x2	7751-14		
M16x2	7751-16		
M18x2.5	7751-18		
M20x2.5	7751-20		

**Note:** These industrial tools do not require a prewinder to facilitate installation. They are "T"-Type threaded mandrel tools.

## One Piece Steel Kit Tools

Size	Part No.
1/4-20	2288-4
5/16-18	2288-5
3/8-16	2288-6
7/16-14	2288-7
1/2-13	2288-8
5/8-11	2288-10



# Bulk Inserts

Heli-Coil stainless steel inserts are available in bulk for higher quantity applications such as rebuilding or remanufacture. Each size comes in three different lengths:

- **Short** (length same as the diameter of the bolt or screw) – for short thread engagement applications.
- **Medium** (length 1–1/2 times the diameter of the bolt or screw) – provides sufficient strength in most applications.
- **Long** (length two times the diameter of the bolt or screw) – provides higher strength in critical applications, (especially in magnesium).

## Inch Series Coarse

Size	Length	Part Number
4-40	.112	1185-04CN 112
	.168	1185-04CN 168
	.224	1185-04CN 224
6-32	.138	1185-06CN 138
	.207	1185-06CN 207
	.276	1185-06CN 276
8-32	.164	1185-2CN 164
	.246	1185-2CN 246
	.328	1185-2CN 328
10-24	.190	1185-3CN 190
	.285	1185-3CN 285
	.380	1185-3CN 380
12-24	.216	1185-1CN 216
	.324	1185-1CN 324
	.432	1185-1CN 432
1/4-20	.250	1185-4CN 250
	.375	1185-4CN 375
	.500	1185-4CN 500
5/16-18	.312	1185-5CN 312
	.469	1185-5CN 469
	.625	1185-5CN 625
3/8-16	.375	1185-6CN 375
	.562	1185-6CN 562
	.750	1185-6CN 750
7/16-14	.438	1185-7CN 438
	.656	1185-7CN 656
	.875	1185-7CN 875
1/2-13	.500	1185-8CN 500
	.750	1185-8CN 750
	1.00	1185-8CN 1000
9/16-12	.562	1185-9CN 562
	.844	1185-9CN 844
	1.125	1185-9CN 1125
5/8-11	.625	1185-10CN 625
	.938	1185-10CN 938
	1.250	1185-10CN 1250
3/4-10	.750	1185-12CN 750
	1.125	1185-12CN 1125
	1.500	1185-12CN 1500
7/8-9	.875	1185-14CN 875
	1.312	1185-14CN 1312
	1.750	1185-14CN 1750
1-8	1.000	1185-16CN 1000
	1.500	1185-16CN 1500
	2.000	1185-16CN 2000

## Inch Series Fine

Size	Length	Part Number
10-32	.190	1191-3CN 190
	.285	1191-3CN 285
	.380	1191-3CN 380
1/4-28	.250	1191-4CN 250
	.375	1191-4CN 375
	.500	1191-4CN 500
5/16-24	.312	1191-5CN 312
	.469	1191-5CN 469
	.625	1191-5CN 625
3/8-24	.375	1191-6CN 375
	.562	1191-6CN 562
	.750	1191-6CN 750
7/16-20	.438	1191-7CN 438
	.656	1191-7CN 656
	.875	1191-7CN 875
1/2-20	.500	1191-8CN 500
	.750	1191-8CN 750
	1.00	1191-8CN 1000
9/16-18	.562	1191-9CN 562
	.844	1191-9CN 844
	1.125	1191-9CN 1125
5/8-18	.625	1191-10CN 625
	.938	1191-10CN 938
	1.250	1191-10CN 1250
3/4-16	.750	1191-12CN 750
	1.125	1191-12CN 1125
	1.500	1191-12CN 1500
7/8-14	.875	1191-14CN 875
	1.312	1191-14CN 1312
	1.750	1191-14CN 1750
1-14	1.000	1191-16CN 1000
	1.500	1191-16CN 1500
	2.000	1191-16CN 2000
1-12	1.000	1191-161CN 1000
	1.500	1191-161CN 1500
	2.000	1191-161CN 2000

## Metric Series Coarse

Size	Length	Part Number
M4X0.7	4.0	1084-4CN 040
	6.0	1084-4CN 060
	8.0	1084-4CN 080
M5x0.8	5.0	1084-5CN 050
	7.5	1084-5CN 075
	10.0	1084-5CN 100
M6x1	6.0	1084-6CN 060
	9.0	1084-6CN 090
	12.0	1084-6CN 120
M7x1	7.0	1084-7CN 070
	10.5	1084-7CN 105
	14.0	1084-7CN 140
M8x1.25	8.0	1084-8CN 080
	12.0	1084-8CN 120
	16.0	1084-8CN 160
M9x1.25	9.0	1084-9CN 090
	13.5	1084-9CN 135
	18.0	1084-9CN 180
M10x1.5	10.0	1084-10CN 100
	15.0	1084-10CN 150
	20.0	1084-10CN 200
M11x1.5	11.0	1084-11CN 110
	16.5	1084-11CN 165
	22.0	1084-11CN 220
M12x1.75	12.0	1084-12CN 120
	18.0	1084-12CN 180
	24.0	1084-12CN 240
M14x2	14.0	1084-14CN 140
	21.0	1084-14CN 210
	28.0	1084-14CN 280
M16x2	16.0	1084-16CN 160
	24.0	1084-16CN 240
	32.0	1084-16CN 320
M18x2.5	18.0	1084-18CN 180
	27.0	1084-18CN 270
	36.0	1084-18CN 360
M20x2.5	20.0	1084-20CN 200
	30.0	1084-20CN 300
	40.0	1084-20CN 400

## Metric Series Fine

Size	Length	Part Number
M8x1	8.0	4255-8CN 080
	12.0	4255-8CN 120
	16.0	4255-8CN 160
M10x1	10.0	4255-10CN 100
	15.0	4255-10CN 150
	20.0	4255-10CN 200
M10x1.25	10.0	4649-10CN 100
	15.0	4649-10CN 150
	20.0	4649-10CN 200
M11x1	11.0	4255-11CN 110
	16.5	4255-11CN 165
	22.0	4255-11CN 220
M11x1.25	11.0	4649-11CN 110
	16.5	4649-11CN 165
	22.0	4649-11CN 220
M12x1.25	12.0	4649-12CN 120
	18.0	4649-12CN 180
	24.0	4649-12CN 240
M12x1.5	12.0	3745-12CN 120
	18.0	3745-12CN 180
	24.0	3745-12CN 240
M14x1.5	14.0	3745-14CN 140
	21.0	3745-14CN 210
	28.0	3745-14CN 280
M16x1.5	16.0	3745-16CN 160
	24.0	3745-16CN 240
	32.0	3745-16CN 320
M18x1.5	18.0	3745-18CN 180
	27.0	3745-18CN 270
	36.0	3745-18CN 360

## Spark Plug Series

Size	Reach	Part No.
10-1.0mm	1/2"	474-4
12-1.25mm	1/2"	482-1
	3/4"	482-2
	3/8"	512
	7/16"	513
14-1.25mm	1/2"	513-13
	3/4"	513-10
	.472	513-20
18-1.50mm	1/2"	514-6
7/8-18	1/2"	518-12
	5/8"	518-12

## Pipe Thread Series

Size	Part No.
1/8-27	327-2
1/4-18	327-4
3/8-18	327-6
1/2-14	327-8
3/4-14	327-12
1–11-1/2	327-16

## Sav-A-Thread Series

Size	Reach	Part No.
M14x1.25	Short	5326-14S
M14x1.25	Normal	5326-14N
M14x1.25	Long	5326-14L

# POP® Blind Riveting Systems

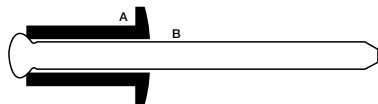
POP is the world acknowledged leader in blind rivet fastening technology, and POP rivet tools are the state-of-the-art in design, performance and durability. In addition to being the industry's original manufacturer and pioneer, POP is constantly updating and improving its complete product line to keep pace with rapidly advancing automotive markets and the increasing needs of today's automotive service professionals

POP rivets are more effective and practical than other fastening methods such as welding, sheet metal screws, nuts and bolts, solid rivets and adhesives. They are ideal for repairs where access is limited to one side only. No surface preparation is required. The job can be done with no special skills. Almost any material can be fastened with POP rivets, especially plastics and sheet metal. The results are uniform and vibration proof.

## Installation

POP rivets consist of two parts: **(A) rivet body** and **(B) setting mandrel**.

In operation, the mandrel is pulled back to expand the rivet body and form a tight vibration-free fastener. The mandrel breaks off automatically after the rivet is set.



1. After selecting the proper rivet, drill a hole corresponding to the diameter of the rivet through the materials to be fastened. When using counter-sunk head rivets a 120° countersunk bit is required. Use POP Part No. 60928 for countersink drilling.
2. Open the handle of the rivet tool and insert the rivet mandrel in the nose-piece of the tool.
3. Place the rivet body in the pre-drilled hole. Then squeeze the rivet tool handles until the rivet mandrel breaks off.

### Automotive repair, shop use

POP rivets provide an effective, high strength fastening technique. They're ideal for structural repairs, body and collision work, modifications, parts and accessory mounting and countless in-shop and miscellaneous applications. The use of rivets in automotive assembly has increased significantly because of their strength and ease of use.

### Choose power or manual

POP's rivet fastening system is one of the most versatile you can buy. It requires minimal capital investment and inventory. The rivets can be installed manually or by power tools. They're designed for simple operation and ease of use.

### Wide application range

POP offers a complete range of rivets to meet almost every automotive, marine, small engine, hardware and shop application. POP rivets are available in various materials, types, sizes and styles for all types of fastening from plastics to dissimilar metals to pressure tight sealing.

## RIVET MATERIALS

In order to meet a variety of requirements for strength, corrosion and rust considerations and application materials, POP rivets are offered in specific materials and material combinations.

TYPE	APPLICATION
<b>All Steel</b>	<b>High strength:</b> use with steel
<b>Aluminum</b>	<b>Lightweight:</b> Use with aluminum, areas susceptible to rust & corrosion
<b>Alum./Steel</b>	Combines features of both materials
<b>All Stainless</b>	Very high strength: Use with stainless & steel. Prevents corrosion or rust.
<b>Stainless/Steel</b>	<b>Very high strength.</b> Applications where corrosion resistance is not a major factor.
<b>Copper</b>	Electrical conductivity

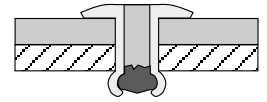
## TYPES & STYLES

### Rivet Types

There are three basic rivet types available for automotive use.

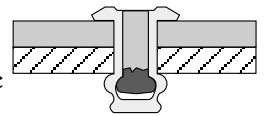
#### Open End

Designed for a wide range of applications, they resemble conventional tubular rivets when set, but retain the mandrel within the rivet body for added strength. Open end rivets are available in a variety of materials in dome, countersunk or large flange head styles.



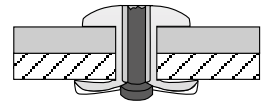
#### Closed End

Specially configured with a cup shaped end that forms a tight seal, POP closed end rivets are much stronger than open end rivets. They are available in dome and countersunk head styles.



#### T-Rivets

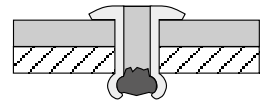
Made for structural and high stress applications. They feature a hardened steel mandrel which splits the rivet body into a trifurcated shape. This provides high clamping strength even in thin or fragile material.



### Head Styles

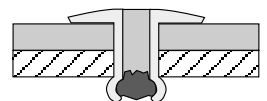
#### Dome Head

Low profile design and neat appearance, this style is very versatile and most commonly used. The head size is twice the diameter of the rivet body. It provides enough bearing surface for all applications except soft or brittle material.



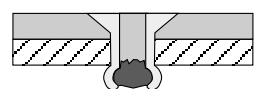
#### Large Flange

Features twice the under-head bearing surface as the dome style. It's ideal for fastening soft or brittle materials to a rigid backing surface.



#### Countersunk

Designed with a 120° head profile for flush surface mounting applications.



# Rivet Ordering Information

All rivet sizes are available in these **500-piece Pro Pack** boxes to meet the increasing needs of today's automotive service professionals. POP also offers all rivet sizes and back-up plates packaged in **100-piece Shop Pack** boxes — convenient for body shop or service garage.



Rivet Dia.	Head Dia.	Grip Range	Plated Steel Rivet Steel Mandrel			Stainless Steel Rivet Steel Mandrel			Stainless Steel Rivet Stainless Steel Mandrel		
			Code No.	100 pc. Shop Pack No.	500 pc. Pro Pack No.	Code No.	100 pc. Shop Pack No.	500 pc. Pro Pack No.	Code No.	100 pc. Shop Pack No.	500 pc. Pro Pack No.
<b>OPEN END RIVETS</b>											
3/32	3/16	Up to 1/8	SD32	59435	60435						
	3/16	1/8 to 1/4	SD34	59436	60436						
1/8	1/4	1/32 to 1/16	SD41	59437	60437	SSD42	59560	60560	SSD42-S	59540	60540
	1/4	1/16 to 1/8	SD42	59438	60438						
	.220	1/16 to 1/8	SK42	59439	60439						
	3/8	1/16 to 1/8	SDL42	59440	60440	SSD43	59561	60561	SSD43-S	59541	60541
	1/4	1/8 to 3/16	SD43	59441	60441						
	.220	1/8 to 3/16				SSD44	59562	60562	SSD44-S	59542	60542
	1/4	3/16 to 1/4	SD44	59442	60442						
	.220	3/16 to 1/4	SK44	59443	60443	SSD46	59563	60563	SSD46-S	59543	60543
	3/8	3/16 to 1/4	SDL44	59444	60444						
	1/4	1/4 to 5/16	SD45	59445	60445	SSD48	59573	60573	SSD48-S	59544	60544
1/4	5/16 to 3/8	SD46	59446	60446							
1/4	3/8 to 1/2	SD48	59447	60447							
5/32	5/16	1/16 to 1/8	SD52	59448	60448	SSD52	59564	60564	SSD52-S	59545	60545
	5/16	1/8 to 3/16	SD53	59449	60449						
	5/16	3/16 to 1/4	SD54	59450	60450	SSD54	59565	60565	SSD54-S	59546	60546
	5/16	1/4 to 3/8	SD56	59451	60451						
	5/16	3/8 to 1/2				SSD56	59566	60566	SSD56-S	59547	60547
3/16	3/8	1/16 to 1/8	SD62	59453	60453	SSD62	59567	60567	SSD62-S	59548	60548
	3/8	1/8 to 1/4	SD64	59454	60454						
	5/8	1/8 to 1/4	SDL64	59455	60455	SSD66	59569	60569	SSD66-S	59550	60550
	3/8	1/4 to 3/8	SD66	59456	60456						
	5/8	1/4 to 3/8	SDL66	59457	60457	SSD68	59570	60570	SSD68-S	59551	60551
	3/8	3/8 to 1/2	SD68	59458	60458						
	5/8	3/8 to 1/2	SDL68	59459	60459						
	3/8	1/2 to 5/8	SD610	59460	60460						
	5/8	1/2 to 5/8	SDL610	59461	60461						
	3/8	5/8 to 3/4	SD612	59462	60462						
	5/8	5/8 to 3/4	SDL612	59463	60463						
1/4	1/2	1/16 to 1/4	SD84	59464	60464						
	1/2	1/4 to 3/8	SD86	59465	60465						
	1/2	3/8 to 1/2	SD88	59466	60466						
	1/2	5/8 to 3/4	SD812	59467	60467						
<b>CLOSED END RIVETS</b>											
1/8	.236	1/16 to 1/8									
	.236	1/8 to 3/16									
	.236	3/16 to 1/4									
	.236	3/16 to 1/4									
	.236	1/4 to 5/16									
	.236	3/8 to 1/2									
5/32	5/16	1/16 to 1/8									
	5/16	1/8 to 3/16									
	5/16	1/8 to 3/16									
	5/16	1/16 to 1/4									
5/16	3/16 to 5/16										
3/16	3/8	1/8 to 1/4	SD64H	59640	60640						
	3/8	1/4 to 3/8									
	3/8	3/8 to 1/2									
1/4	1/2	1/8 to 1/4	SD84H	59642	60642						
	1/2	1/4 to 3/8									
<b>T-RIVETS</b>											
1/4	.510	1/32 to 9/64									
	.510	9/64 to 3/16									
	.510	33/64 to 5/8									

## Rivet Code Explanation – Example: Rivet Code No. AD42AH

<b>A</b>	<b>D</b>	<b>4</b>	<b>2</b>	<b>A</b>	<b>H</b>
<b>Body Material</b>	<b>Head Style</b>	<b>Rivet Diameter</b>	<b>Max. Grip Length</b>	<b>Mandrel Material</b>	<b>Core Design*</b>
A – Aluminum S – Carbon Steel SS – Stainless Steel	D – Dome Head DL – Dome Head, Large Flange K – Countersunk	in 32nds of an inch 4/32 = 1/8"	in 16ths of an inch 2/16 = 1/8"	A – Aluminum S – Stainless Steel Blank – Steel	H – Hollow Blank – Solid Core

\* Pertains to closed end rivets only.

# Rivet Ordering Information

Rivet Dia.	Head Dia.	Grip Range	Aluminum Rivet Aluminum Mandrel			Aluminum Rivet Steel Mandrel			Copper Rivet Steel Mandrel		
			Code No.	100 pc. Shop Pack No.	500 pc. Pro Pack No.	Code No.	100 pc. Shop Pack No.	500 pc. Pro Pack No.	Code No.	100 pc. Shop Pack No.	500 pc. Pro Pack No.
<b>OPEN END RIVETS</b>											
33/32	3/16	Up to 1/8	AD32-A	59470	60470	AD32	59503	60503			
	3/16	1/8 to 1/4	AD34-A	59471	60471	AD34	59504	60504			
1/8	1/4	1/32 to 1/16	AD41-A	59472	60472	AD41	59505	60505	CD42	59571	60571
	1/4	1/16 to 1/8	AD42-A	59473	60473	AD42	59506	60506			
	.220	1/16 to 1/8	AK42-A	59474	60474	AK42	59507	60507			
	3/8	1/16 to 1/8	ADL42-A	59475	60475	ADL42	59508	60508			
	1/4	1/8 to 3/16	AD43-A	59476	60476	AD43	59509	60509			
	.220	1/8 to 3/16				AK43	59510	60510			
	1/4	3/16 to 1/4	AD44-A	59477	60477	AD44	59511	60511	CD44	59572	60572
	.220	3/16 to 1/4				AK44	59512	60512			
	3/8	3/16 to 1/4	ADL44-A	59478	60478	ADL44	59513	60513			
	1/4	1/4 to 5/16	AD45-A	59479	60479	AD45	59514	60514			
	1/4	5/16 to 3/8	AD46-A	59480	60480	AD46	59515	60515			
	1/4	3/8 to 1/2	AD48-A	59481	60481	AD48	59516	60516			
5/32	5/16	1/16 to 1/8	AD52-A	59482	60482	AD52	59517	60517			
	5/16	1/8 to 3/16	AD53-A	59483	60483	AD53	59518	60518			
	5/16	3/16 to 1/4	AD54-A	59484	60484	AD54	59519	60519			
	5/16	1/4 to 3/8	AD56-A	59485	60485	AD56	59520	60520			
	5/16	3/8 to 1/2	AD58-A	59486	60486	AD58	59521	60521			
3/16	3/8	1/16 to 1/8	AD62-A	59487	60487	AD62	59522	60522			
	3/8	1/8 to 1/4	AD64-A	59488	60488	AD64	59523	60523			
	5/8	1/8 to 1/4	ADL64-A	59489	60489	ADL64	59524	60524			
	3/8	1/4 to 3/8	AD66-A	59490	60490	AD66	59525	60525			
	5/8	1/4 to 3/8	ADL66-A	59491	60491	ADL66	59526	60526			
	3/8	3/8 to 1/2	AD68-A	59492	60492	AD68	59527	60527			
	5/8	3/8 to 1/2	ADL68-A	59493	60493	ADL68	59528	60528			
	3/8	1/2 to 5/8	AD610-A	59494	60494	AD610	59529	60529			
	5/8	1/2 to 5/8	ADL610-A	59495	60495	ADL610	59530	60530			
	3/8	5/8 to 3/4	AD612-A	59496	60496	AD612	59531	60531			
	5/8	5/8 to 3/4	ADL612-A	59497	60497	ADL612	59532	60532			
	1/4	1/2	1/16 to 1/4	AD84-A	59498	60498	AD84	59533	60533		
1/2		1/4 to 3/8	AD86-A	59499	60499	AD86	59534	60534			
1/2		3/8 to 1/2				AD88	59535	60535			
1/2		5/8 to 3/4	AD812-A	59500	60500	AD812	59536	60536			
<b>CLOSED END RIVETS</b>											
1/8	.236	1/16 to 1/8	AD42AH	59620	60620	AD42H	59590	60590	CD45H	59644	60644
	.236	1/8 to 3/16				AD43H	59604	60604			
	.236	3/16 to 1/4	AD44AH	59621	60621	AD44H	59592	60592			
	.236	3/16 to 1/4				AK44H	59593	60593			
	.236	1/4 to 5/16				AD45H	59608	60608			
	.236	3/8 to 1/2				AD48H	59595	60595			
5/32	5/16	1/16 to 1/8				AD52H	59596	60596			
	5/16	1/8 to 3/16				AD53H	59609	60609			
	5/16	1/8 to 3/16				AK53H	59607	60607			
	5/16	1/16 to 1/4	AD54AH	59622	60622						
3/16	3/8	1/8 to 1/4	AD64AH	59624	60624	AD64H	59599	60599			
	3/8	1/4 to 3/8				AD66H	59605	60605			
	3/8	3/8 to 1/2				AD68H	59601	60601			
1/4	1/2	1/8 to 1/4				AD84H	59606	60606			
	1/2	1/4 to 3/8				AD86H	59603	60603			
<b>T-RIVETS</b>											
1/4	.510	1/32 to 9/64				AD8140-T	59580	60580			
	.510	9/64 to 3/16				AD8187-T	59581	60581			
	.510	33/64 to 5/8				AD8620-T	59582	60582			

## BACK-UP PLATES

Hole Size	Material	Code No.	100 pc. Shop Pack	Thrift Packs	
			Part No.	Part No.	Qty./Pkg.
1/8	Steel	SBUP-4	59660	57660	40
1/8	Aluminum	ABUP-4	59661	57661	30
3/16	Aluminum	ABUP-6	59662	57662	30

In order to select the proper rivet for your application, follow the procedure below:

1. Select rivet type according to application material and holding strength required. (Refer to Rivet Types, Page 17.)
2. Choose rivet head style best suited for your application. (See Head Styles, Page 17.)
3. Measure joint thickness to determine correct rivet length (Grip Range).
4. Select proper rivet diameter according to recommendations for hole size and strength required. (Larger rivets provide more strength.)



# Thrift Packs



## Thrift Packs

The nine most popular rivet sizes are packaged in these reusable, easy-to-store boxes. Perfect for the do-it-yourselfer!

Rivet Dia.	Head Dia.	Grip Range	Plated Steel Rivet Steel Mandrel		Aluminum Rivet Aluminum Mandrel		Qty. Per Pkg.
			Part No.	Code No.	Part No.	Code No.	
<b>Rivet Thrift Packs – Open End Rivets</b>							
1/8	1/4	1/16 to 1/8	57438	SD42	57473	AD42-A	25
	1/4	3/16 to 1/4	57442	SD44	57477	AD44-A	20
	1/4	5/16 to 3/8	57446	SD46	57480	AD46-A	15
3/16	3/8	Up to 1/8			57487	AD62-A	15
	3/8	1/8 to 1/4			57488	AD64-A	15
	3/8	1/4 to 3/8			57490	AD66-A	15

# PowerLink 30™



Rivet materials and sizes included:

Kit Part No. 5880

Material	Diameter	Grip Range
Aluminum rivet/aluminum mandrel	3/16"	3/16-1/4"
Aluminum rivet/aluminum mandrel	1/8"	1/16-1/8"
Aluminum rivet/steel mandrel	3/16"	1/16-1/8"
Steel rivet/steel mandrel	1/8"	1/16-1/8"
Steel rivet/steel mandrel	1/8"	3/16-1/4"
Countersunk steel rivet/steel mandrel	1/8"	3/16-1/4"

## PowerLink 30 Rivetool Kit

Contains one PowerLink 30™ rivetool, wrench and nosepieces for up to 3/16" rivets AND an assortment of six popular rivet sizes/materials, for a total of 200 rivets, in a durable storage case.

# Custom Application Rivets

POP has the most complete line of special application rivets. These include **T-Rivets** for window regulator and door handle applications, **Trim Rivets**, **Bumper Rivets**, **Rear Window Gasket Rivets**, **Swivel Emblem Trunk Rivets** and more.

Rivet Dia.	Head Dia.	Application	Plated Steel Rivet Steel Mandrel		Aluminum Rivet Aluminum Mandrel		Aluminum Rivet Steel Mandrel		St. Steel Rivet Steel Mandrel		Use on/Equivalent to
			P/N	Code No.	P/N	Code No.	P/N	Code No.	P/N	Code No.	
<b>Pro Packs – Custom Application Rivets – 500 Per Pack</b>											
1/8	1/4	Aluminum Trim Channel Rivet			60477	AD44-A					For attaching molding channels with snap-in color trim
1/4	.510	Window Regulator Rivet					60580	AD8140-T			GM #9436175, Ford #385189, Chrysler #6031115
1/4	.510	Outside Door Handle Rivet					60581	AD8187-T			Ford, Lincoln & Mercury cars & trucks #388047-S100
1/4	.510	Glass Stop Rivet					60582	AD8620-T			Ford #385323, Chrysler #6031091
5/32	5/16	Swivel Emblem Trunk Lock Rivet					60607	AK53H			GM #9432137, Chrysler #6032138
1/4	1/2	Bumper Rivet	60800	SD84038							Ford #372820-S36, yellow zinc dichromate coated
3/16	3/8	Bumper Fascia Rivet	60801	SD66025							GM #9439719, Black oxide coated
1/8	13/64	Std. Alum. Trim Clip Rivet			60802	AD43-A-28					Used on trim clips
1/8	13/64	Long Alum. Trim Clip Rivet			60803	AD44-A-28					Used on filler covered panels
1/8	13/64	Std. Stainless Trim Clip Rivet							60804	SSD43-28	Used for high strength applications
1/8	.318	Rear Window Gasket Rivet					60805	ADL43-318			Fisher body #20325696
1/8	1/4	Multi purpose Rivet					60806	ADL43			GM #9432552
<b>Shop Packs – Customer Application Rivets – 100 Per Box</b>											
1/8	1/4	Aluminum Trim Channel Rivet			59477	AD44-A					For attaching molding channels with snap-in color trim
1/4	.510	Window Regulator Rivet					59580	AD8140-T			GM #9436175, Chrysler #6031115, Ford #385189
1/4	.510	Outside Door Handle Rivet					59581	AD8187-T			Ford, Lincoln & Mercury cars & trucks #388047-S100
1/4	.510	Glass Stop Rivet					59582	AD8620-T			Ford #385323, Chrysler #6031091
5/32	5/16	Swivel Emblem Trunk Lock Rivet					59607	AK53H			GM #9432137, Chrysler #6032138
1/4	1/2	Bumper Rivet	59800	SD84038							Ford #372820-S36, yellow zinc dichromate coated
3/16	3/8	Bumper Fascia Rivet	59801	SD66025							GM #9439719, Black oxide coated
1/8	13/64	Std. Alum. Trim Clip Rivet			59802	AD43-A-28					Used on trim clips
1/8	13/64	Long Alum. Trim Clip Rivet			59803	AD44-A-28					Used on filler covered panels
1/8	13/64	Std. Stainless Trim Clip Rivet							59804	SSD43-28	Used for high strength applications
1/8	.318	Rear Window Gasket Rivet					59805	ADL43-318			Fisher body #20325696
1/8	1/4	Multi Purpose Rivet					59806	ADL43			GM #9432552

# Manual Rivetools

POP makes the easiest to use and most portable rivetools available on the market. They're the industry standard — world renowned for quality, craftsmanship and versatility. POP manual tools

are designed for shop, field or low-volume use where power is not practical or available. A single, firm squeeze is all it takes to set the smaller rivet sizes. All POP rivet tools are equipped with

hardened tool steel jaws to provide durability and longer life as well as nosepieces to set 3/32" to 3/16" open end rivets.



## A475

This PowerLink LeverLite comes ready to set 1/4" diameter POP rivets. Included is the nosepiece required to set tough T-Rivets. Features a durable, unitized body with adjustable stroke for fast, easy operation.



## PRG111

An inexpensive hand tool for the do-it-yourself or occasional user. Designed to set 1/8" diameter rivets and some larger sizes. Ideal for the mechanic's tool box.

## PRG440\*

Durable, dependable push-type hand-operated riveter sets most types and styles of POP rivets up to 1/4". Specially designed for use where lateral space is limited.

\*Special Tooling is required to set 1/4" Rivets (Use PRN 811 nosepiece, PRG 540-44 Jaws and PRG 740-7A Jaw Pusher).



## PowerLink 30 P/N PowerLink 30

This revolutionary rivettool has up to twice the pulling power of other tools tested. The shorter grip is designed for one-hand operation, and the innovative soft handles contour to fit the hand. This rivettool includes wrench and nosepieces for up to 3/16" rivets.



## Pop Swivelhead Rivet Tool P/N 61946\*

- Rotates full 360° for easy access to any application
- Includes 3/32, 1/8, 5/32, and 3/16 nosepieces and wrench
- All steel construction for durability

\*Available late 2002

# Power Rivetools



## PRG510A-Plus

Designed for high production and trouble-free operation. This pneumatic rivet tool is ideal for a variety of applications. Comes with everything needed to set 1/8" thru 3/16" rivet sizes.

## 60865

Light duty hydraulic rivettool kit (85–90 psi maximum). This kit, contained in a sturdy, blow-molded box, comes complete with spare front-end parts and jaw lube and supplies nosepieces to set 3/16" and 1/4" rivets.



## PRG544

Heavy duty air hydraulic rivet tool designed to help increase productivity and avoid downtime. It is the leading choice for high volume, trouble-free operations. Sets a variety of rivet styles and materials up to 1/4" and has hardened steel jaws. Tool comes ready to set 1/4" rivet and includes a 3/16" conversion kit.

# Selection Guides

## MANUAL TOOL & RIVET GUIDE

TOOL	RIVET MATERIAL		RIVET DIAMETERS						TOOL	RIVET MATERIAL		RIVET DIAMETERS					
	Rivet	Mandrel	3/32	7/64	1/8	5/32	3/16	1/4		Rivet	Mandrel	3/32	7/64	1/8	5/32	3/16	1/4
Power Link30	Alum.	Alum.	●			● ●	● ●	● ●	A475 & PRG 440	Alum.	Alum.	●		● ●	● ●	● ●	● ●
	Alum.	Steel	●			● ●	● ●	●		Alum.	Steel	●		● ●	● ●	● ●	● ●
	Steel	Steel	●			●	●	●		Steel	Steel	●		●	●	●	●
PRG 111	St'less	St'less				●			PRG 440	St'less	St'less			●	●	●	
	St'less	Steel				●				St'less	Steel			● ●	● ●	● ●	
	T-Rivets										T-Rivets						●

● Open-End Rivets ● Closed-End Rivets

## POWER TOOL/RIVET GUIDE

TOOL	RIVET MATERIAL		RIVET DIAMETERS										
			OPEN-END RIVETS					CLOSED-END SEALING RIVETS				T-RIVETS	
	Rivet	Mandrel	3/32	1/8	5/32	3/16	1/4	1/8	5/32	3/16	1/4	3/16	1/4
PRG510	Alum.	Alum.	● ●	● ●	● ●	● ● ●	● ●	● ●	● ●	● ●			
A-PLUS	Alum.	Steel	● ●	● ●	● ●	● ● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●
PRG 544	Steel	Steel	● ●	● ●	● ●	● ● ●	● ●				● ●		
60865	St'less	St'less		● ●	● ●	● ● ●	● ●	● ●	● ●	● ●			
	St'less	Steel		● ●	● ●	● ● ●	● ●						

● PRG510A-Plus ● PRG544 ● 60865



Nosepieces

## POP Rivetool Interchangeable Nosepieces

POP Rivetools are furnished with nosepieces to set the most frequently used range of rivet sizes (see tool descriptions on page 21). To order additional nosepieces for other requirements — rivet sizes and types — use the chart below.

TOOL	RIVET SIZE					
	3/32	1/8	5/32	3/16	1/4	1/4 T-Rivet
PowerLink 30	PL30-015	PL30-016	PL30-017	PL30-018	—	—
A475	—	A450-22	A450-6	A450-5	A450-23	A450-21
PRG440 & PRG544	PRN314	PRN414	PRN514	PRN614	PRN811	PRN825
PRG510A-Plus	PRN314	PRN414	PRN514	PRN614	—	—
60865	—	—	—	60865-01D	60865-01F	60865-

## Replacement Jaws

Replacement Jaws Stock No.	For Use With Tool Stock No.	Accommodates Rivet Diameters
PL30-010	PowerLink 30	Up to 3/16"
A450-2	A475	All
PRG540-46	PRG440 & PRG544	Up to 3/16"
PRG540-44	PRG440 & PRG544	1/4"
PRG402-8A	PRG510A-Plus	Up to 3/16"
60865-07	60865	All



Jaws



Countersunk Drill  
(P/N 60928)

\*PRG111 – no replacement parts available

# Plastic Expansion Rivets



This unique device is a one piece, all plastic expansion rivet designed to securely fasten a wide variety of

materials in a broad range of applications.

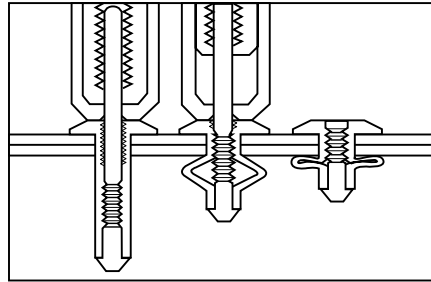
The POP Plastic Rivet quickly inserts from one side of the assembly, using standard rivet setting tools. As the tool pulls the pin through the body, it draws the panels together.

When set, the pin breaks off flush with the head, leaving an attractive, solid color finished appearance.

The POP Plastic Rivet will hold panels of a wide variety of materials, metal or plastic. It is particularly effective for soft materials such as rubber or padded fabrics.

Auto manufacturers use these rivets for many applications on today's automobiles. When necessary, these rivets must be replaced with plastic rivets that

meet or exceed OEM specifications. POP Plastic Rivets are designed to meet these specifications.



1. Insert plastic rivet in assembly with Plastic Rivet Tool P/N 60930 engaging the pin.
2. As tool pulls pin through body it folds legs in middle and draws panels together at same time.
3. Pin is pulled to full extension after legs are clamped tight against the panel for a secure hold. The pin breaks off and is removed.

## Features:

- Easy assembly from one side
- Draws mating panels together and clamps them securely without secondary washers.
- Prevents marring of soft, painted or other materials that are easily damaged
- Wide-flange design eliminates rivet pull-through in soft materials
- Provides secure clamping action
- Rivet pin is broken off during assembly for an attractive, solid color finished appearance
- Strong, lightweight, non-corrosive, non-conductive
- Available in a wide variety of sizes

## Applications:

- Fascia strips and grill attachments
- License plate brackets
- Exterior molding
- Hi mount stop light
- Door panel attachments

## Ordering Information

POP offers plastic rivets for the most popular aftermarket applications. All sizes are packaged in reusable, plastic boxes. Each package contains 25 rivets.



PART NO.	RIVET DIA.	SUGGESTED DRILL SIZE	GRIP RANGE	HEAD DIA.	REPLACES OEM PLASTIC RIVET PART NUMBER
57712	5.0mm	7/32	.059-.177	.472	GM 20423647, Ford N803170S, Ford N804189S
57714	5.0mm	7/32	.118-.177	.472	AMC 8934202855, Ford N804863S, Chry 34202855, Chry 6500859
57715	5.0mm	7/32	.118-.236	.472	AMC 8934202652, Chry 6500899, GM 20432975, Ford N804343S, VW 175-853-577
57720	5.0mm	7/32	.236-.394	.472	Chry 6500898, Chry 6500982
57721	6.0mm	1/4	.157-.335	.512	GM-BOC 25524005
57732	6.3mm	1/4	.157-.236	.669	Chry 4370132, GM 14070914
57735	6.3mm	1/4	.157-.236	.669	Chry 6500911, GM 14063981, GM-CPC 15506827, GM- T&B 15506921, Ford/Mazda KA01500Z1, Ford N803043S
57736	6.3mm	1/4	.157-.394	.512	GM 20452072, Ford N803862S
57737	6.3mm	1/4	.157-.394	.669	AMC 8934201631, AMC 8934201835
57741	6.3mm	1/4	.315-.472	.661	Chry 4370138, Ford N804675S
57747	6.6mm	9/32	.098-.197	.512	GM 20421672
57748	6.6mm	9/32	.098-.197	.709	GM 20433026, VW 175-853-577A
57752	7.0mm	5/16	.098-.236	.709	GM 1019689, GM-CPC 10087278

## Plastic Rivet Tool

The POP Plastic Rivet Setting Tool P/N 60930, is designed especially for setting POP Plastic Rivets. It was developed to set most plastic rivets in one stroke and you never need to

change the nosepiece. The POP Plastic Rivet Setter is suitable for utility needs as well as service or repair needs.





# POP-NUT® Sheet Metal Inserts



POP Sheet Metal Inserts are designed for use in any sheet metal application. They allow the do-it-yourselfer, as well as the automotive professional,

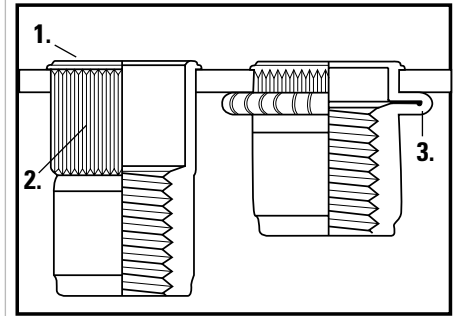
to use bolts and machine screws in place of weaker sheet metal screws even when you can get to only one side of the work.

POP Sheet Metal Inserts are knurled to keep them from spinning in the hole. When forced into the hole and set in place, the knurl engages the parent material providing high resistance to spinning due to over-torque or cross threading. The “bubble” of material over the backside means that the insert will not pull through; even when used

in thin material. POP Sheet Metal Inserts are made of cadmium-plated steel to provide strong, corrosion-resistant threads. Two different grip ranges are available to accommodate most applications. When installed, the low profile head is nearly flush so no countersinking is necessary.

Sheet Metal Inserts can be used to attach luggage racks, mud flaps, side moldings, rear window louvers, roof racks, ladders, grab bars, truck bed hand rails, wind deflection screens, custom ground effects, almost any accessory to sheet material.

Sheet Metal Inserts are stronger and more reliable than sheet metal screws and allow more flexibility in assembly and disassembly.



1. Low profile head means the insert is nearly flush. No countersinking necessary.
2. Axial knurl keeps the insert from spinning in the hole.
3. “Bubble” of material provides high resistance to insert pull out.



POP offers general purpose threaded inserts for sheet metal fastening applications. These inserts are packaged in reusable plastic boxes. Ideal for body/customizing shop use as well as the do-it-yourselfer.

## Mandrel/Nosepiece Sets

Each sheet metal insert thread size requires it's own mandrel/nosepiece set to facilitate installation.

Part No.	Thread Size
67933	6-32
67934	8-32
67935	10-24
67936	10-32
67937	1/4-20
67939	5/16-18
67941	3/8-16
67944	M5x0.8
67945	M6x1
67946	M8x1.25
67947	M10x1.5

## Ordering Information

PART NO.	THREAD SIZE	DRILL SIZE	GRIP RANGE	PIECES PER BOX
57821	6-32	17/64	.020-.080	50
57822	8-32	17/64	.020-.080	50
57823	10-24	19/64	.020-.130	50
57824	10-32	19/64	.020-.130	50
57825	1/4-20	25/64	.027-.165	40
57827	5/16-18	17/32	.027-.150	25
57829	3/8-16	17/32	.027-.150	20
57836	6-32	17/64	.080-.130	50
57837	8-32	17/64	.080-.130	50
57838	10-24	19/64	.130-.225	50
57839	10-32	19/64	.130-.225	50
57840	1/4-20	25/64	.165-.260	40
57842	5/16-18	17/32	.150-.312	25
57844	3/8-16	17/32	.150-.312	20
57832	M5x0.8	19/64	0.5-3.3mm	50
57833	M6x1	25/64	0.7-4.2mm	40
57834	M8x1.25	17/32	0.7-3.8mm	25
57835	M10x1.5	17/32	0.7-3.8mm	20

## Kwikset POP-Nut Sheet Metal Insert Tool P/N 67931\*



- Powerlink design for fast installation of POP-Nut sheet metal inserts
- Compact, slim-line design for easy carriage in pocket/tool belt
- Comfortable santoprene handle grip offers extra shock absorption
- Robust cast steel construction

## Kwikset POP-Nut Sheet Metal Insert Kits

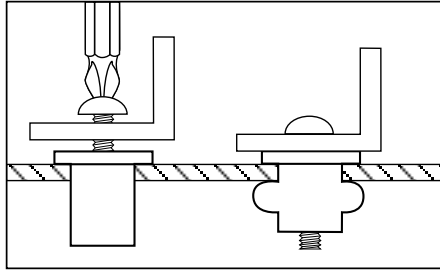
- Includes Kwikset POP-Nut Sheet Metal Insert Tool and 10 pieces of assorted inserts
- Metric Kit includes M4, M5, M6, M8 inserts and mandrels **P/N6799\***
- Inch Kit includes 8-32, 10-24, 10-32, 1/4-20, and 5/16-18 inserts and mandrels **P/N6798\***
- Durable molded box for storage and quick access

\*Due late 2002

# WELL-NUT Threaded Inserts



The WELL-NUT Threaded Insert is a flanged rubber bushing with a brass nut molded into one end. Tightening a conventional machine screw threaded in the brass nut causes the insert to expand against the inner side of thin-walled materials such as body panels, firewalls, etc., or against the sides of a blind hole in solid material — making a secure fastening.



1. Place WELL-NUT insert all the way into pre-drilled hole until flange is firmly against mounting surface.
2. Pass machine screw through part to be fastened and tighten until snug.

- **Provides a leak-proof seal**
- **No special tool required**
- **Muffles noise and absorbs shock**

## Features:

- Fastens in thin walls or blind holes
- Functions as a threaded insert or a fastener or BOTH
- Seals against air or liquid leakage
- Muffles noise
- Dampens vibration and shock
- Ideal for mixed material fastening
- Removable
- Installs with conventional tools
- One-step installation

## Applications:

- Luggage carriers
- Roof racks
- License plate brackets
- Mirror supports
- Inner door panels
- Spoilers and other aerodynamic accessories
- Ground effects
- Speaker housings
- Anywhere a leak-proof seal is required

## Ordering Information

PART NUMBER	THREAD SIZE	DRILL SIZE	GRIP RANGE	PIECES PER BOX
57205	6-32	5/16	.015-.156	25
57207	8-32	5/16	.015-.154	25
57219	10-32	3/8	.015-.192	25
57220	M5x0.8	3/8	.015-.192	25
57243	1/4-20	1/2	.031-.187	20
57244	M6x1	1/2	.031-.187	20
57255	5/16-18	5/8	Up to .187	12
57256	M8x1.25	5/8	Up to .187	12
57259	3/8-16	3/4	.015-.437	6



POP WELL-NUTS are available in reusable, plastic boxes. No special tooling is required to set these inserts. Ideal for body shop use as well as the do-it-yourselfer.

# Creating the Future Worldwide

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At **Emhart**, creating the future is about growth, about change and about taking risks. It is who we are and what we do. Our focus is to reduce the overall product assembly costs of our customers by anticipating needs and meeting those needs with technology and market-driven solutions.

Emhart is a global leader in the design and creation of unique assembly technologies, delivering depth and breadth of service and product through a flexible, cross-functional global organization.

## **Owning the Customer's Total Experience**

We provide every customer with the capability to satisfy every aspect of fastening and assembly technology. From concept through installation, around the corner and around the globe, Emhart develops and delivers solutions for challenging assembly applications.

## **Technology Optimization**

Emhart has the ability to objectively match customer priorities, applications and manufacturing environment with the most appropriate assembly technology and fastening systems. We provide this capability through Application engineers, and Mobile, Stationary and Virtual Innovation Centers located around the world. Each is electronically linked, capable of sharing application data and new design concepts with each other as well as with our customers.

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DODGE

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