

STANLEY[®]
Engineered Fastening

HELI-COIL[®]
Serrated Spark Plug
Inserts

Technical Bulletin 804E



HeliCoil[®]

SERRATED SPARK PLUG INSERTS

(FOR ORIGINAL DESIGN AND PRODUCTION SALVAGE IN INDUSTRIAL ENGINES)

— WHAT THEY ARE...

Heli-Coil Spark Plug Inserts are manufactured from 18-8 round stainless steel wire that is formed into a 60° diamond shaped wire. This cold-worked wire, which has a tensile strength of 200,000 PSI, is wound into a spiral coil with a driving tang and a notch to remove the tang after the insert is screwed into the Heli-Coil tapped hole.

RETENTION PRINCIPLE

In its free state, the insert is larger in diameter than the tapped hole. Once installed, the insert assumes the configuration of the tapped hole. The resultant outward spring-like action anchors the insert in place.

In addition, the Spark Plug Insert has a serrated top coil which is offset into the parent material. This offsetting is recommended because of the high temperature and high performance requirements of spark plug ports. The Heli-Coil Spark Plug Insert becomes an integral part of the cylinder head – providing a higher strength assembly than that of the original parent material.

– WHAT THEY DO ...

- **Permit easier spark plug removal** because there is no possibility of corrosion between the spark plug and the hard drawn, smooth surface stainless steel Heli-Coil Insert.
- **Eliminate thread failure** due to stripping, vibration and fatigue.
- **Assure freedom from thread wear**, even after repeated disassembly and reassembly.
- **Greatly increase tapped thread strength** under all operating conditions.
- **Offer speed and economy in production salvage**, providing greater-than-original thread strength.

– HOW THEY ARE USED ...

The design of a Heli-Coil Spark Plug Assembly follows conventional engineering practice. Select the correct Heli-Coil Insert based on the plug length. In the event that a special plug length is being used, our Applications Department should be consulted for a suitable Heli-Coil Insert.

AIRCRAFT ENGINES

Original Equipment and Production Salvage

Use the same basic procedure described on the following pages when making installations in aircraft engines. However, because of special engine performance requirements, location of spark plug ports, etc., special tools and additional procedures may be required. Our Applications Dept. should be consulted for original equipment applications in aircraft engines.

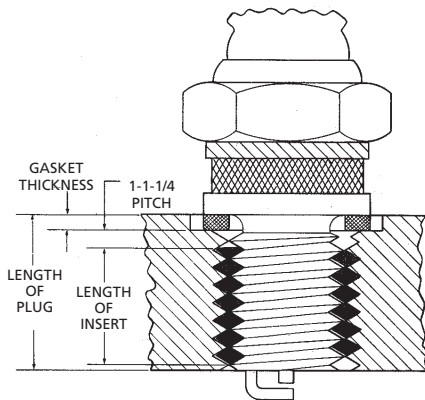
Repair

Repairs to damaged spark plug ports on aircraft engines should be made in accordance with the following: Manufacturer's Service Bulletin for each specific engine.
AF T.O. 44H1-117 (NAVWEPS 02-1-19).

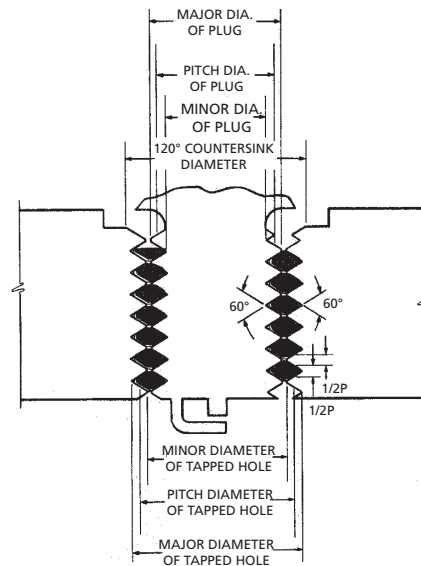
SIZE: 14-1.25 mm

Operation No.	Operation Description	Tool or Gage
10	Drill for Reaming	35/64 (.547) Drill
20	Ream Minor Diameter .562-.565	9/16 (.5625) Reamer
30	Countersink to .600-.620 diameter x 120°	120° Countersink
40	Tap 14-1.25 mm STI Thread	Heli-Coil Piloted Tap – No. 137-33
50	Remove Chips	
60	Gage 14-1.25 mm STI Thread	Heli-Coil Gage No. 845
70	Install 14-1.25 mm Heli-Coil Insert 1 to 1-1/4 Pitch Below Top Surface	Heli-Coil Hand Inserting Tool No. 4889-14 or Power Tool
80	Break Off Insert Driving Tang	Long Nose Pliers
90	Offset and Stake	Heli-Coil Offset and Staking Tool No. 468

Nominal Thread Size	Plug Length	HELI-COIL INSERT				HELI-COIL TAPPED HOLE					Heli-Coil Tap Major Dia. Max.
		Heli-Coil Part No.	No. of Free Coils (Counted from Notch)	Insert Free O.D.		Minor Dia.		Major Dia.	Pitch Dia.		
				Min.	Max.	Min.	Max.	Min.	Min.	Max.	
14-1.25 mm	3/8	137-43	3-5/8								
14-1.25 mm	7/16	137-44	4-3/4	.678	.698	.562	.567	.613	.5892	.5925	.622
14-1.25 mm	1/2	137-22	5-7/8								
14-1.25 mm	3/4	137-45	10-1/4								
18-1.50 mm	1/2	2-52	4-1/2	.885	.905	.718	.723	.793	.7503	.7543	.800
18-1.50 mm	9/16	2-74	5-1/2								



INSERT LENGTH IS DETERMINED BY PLUG LENGTH



ASSEMBLY DIMENSIONS

SIZE: 18-1.50 mm									
Operation No.		Operation Description				Tool or Gage			
10		Drill for Reaming				45/64 (.703) Drill			
20		Ream Minor Diameter .718-.721				23/32 (.7187) Reamer			
30		Countersink to .780-.800 diameter x 120°				120° Countersink			
40		Tap 18-1.50 mm STI Thread				Heli-Coil Piloted Tap – No. 2-94			
50		Remove Chips							
60		Gage 18-1.50 mm STI Thread				Heli-Coil Gage No. 846			
70		Install 18-1.50 mm Heli-Coil Insert 1 to 1-1/4 Pitch Below Top Surface				Heli-Coil Hand Inserting Tool No. 4889-18 or Power Tool			
80		Break Off Insert Driving Tang				Long Nose Pliers			
90		Offset and Stake				Heli-Coil Offset and Staking Tool No. 520			

Nominal Thread Size	Plug Length	TOOLING				ASSEMBLED INSERT			
		Taps Finishing	Gages Thread Plug	Hand Inserting Tools	Offset & Staking Tools	Pitch Dia.		Minor Dia.	
						Min.	Max.	Min.	Min.
14-1.25 mm	3/8								
14-1.25 mm	7/16	137-33	845	4889-14	468	.5192	.5235	.498	.506
14-1.25 mm	1/2								
14-1.25 mm	3/4								
18-1.50 mm	1/2	2-94	846	4889-18	520	.6703	.6753	.631	.640
18-1.50 mm	9/16								

INSERT REMOVAL AFTER OFFSETTING

In the event that it is necessary to remove an insert after the top coil has been offset, pry the serrated coil out of the parent material and use Heli-Coil Extracting Tool No. 1227-16 according to instructions furnished with each tool.

