THREAD REPAIRING SYSTEMS & ACCESSORIES

RECOIL® Catalogue

RECOIL

THREAD REPAIRING SYSTEMS & ACCESSORIES

Introduction

Arconic Fastening Systems Recoil® brand manufacturing operations are located in Australia, with sales and warehouse facilities strategically located in North America, Asia, and Europe. Extensive worldwide distribution, coupled with the company's manufacturing strategy, offers significant advantages to end users.

Arconic Fastening Systems ensures a global consistency of quality design standards in manufacturing the full range of wire thread inserts in one production facility. Users around the world can be assured of high standards and the consistency of all our products.

Inserts are manufactured in standard sizes for all metric and inch thread forms. A comprehensive design facility is available to ensure that non-standard inserts can be manufactured for special part requirements.

Prompt availability of products to customers worldwide is ensured by an efficient international freight service and a network of stocking distributors. Arconic Fastening Systems is committed to the highest quality products and operating systems and employs a strict quality management system in accordancewith:

- **AS9100** accreditation
- **ISO9001** accreditation
- **TS16949** accreditation
- **ISO14001** Environmental Systems

Arconic Fastening Systems will provide technical assistance to production engineers so that optimum installation efficiency can be achieved and maintained. Recoil brand coils are available to the following international and customer standards:

- NASM122076 Series - Free Running - UNC
- NASM124651 Series - Free Running - UNF
- NASM21209 Series – Locking UNC and UNF
- NASM8846
- BS7751 - Metric - Coarse
- BS7752 - Metric - Fine
- BS7753
- BS4377
- MA3279, MA3280, MA3281 - Metric - Free Running
- MA3329, MA3330, MA3331 - Metric - Self Locking
- AS6733 Series - UNF - Unplated
- AS8455 Series - UNF - Cadmium Plated
- NAS1130 - Imperial Tangless®
- NA0276 - Metric Tangless®
- AGS3700 Series - Nimonic Alloy 90 - Self Locking
- General Electric - N926 Series, N913
- LN9499, LN9039
- DIN8140
- BACI12AE - Boeing

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Recoil Range

The Recoil system consists of precision inserts, quality high speed taps, and easy-to-use installation tools which are used for repairing damaged screw threads or creating strong new threads. Recoil helically wound screw-thread inserts are generally manufactured from Type 304 (18-8) stainless steel wire cold rolled into a diamond shaped cross section. Recoil inserts can be supplied in other materials such as Inconel X750, Inconel 625, Nimonic 90, Nitronic 60, Phosphor Bronze and Type 316 stainless steel.

Recoil inserts are available in either standard free running form or screw lock type which provides an internal locking feature. Inserts are manufactured for every thread form including UNC, UNF, BSC, BSW, BSF, BA, BSP, NPT and ISO Metric thread sizes. Inserts are available in 5 different standard lengths. 1D, 1.5D, 2D, 2.5D and 3D. Special lengths are available on request.

Thread Repair Kits

A full range of Recoil thread repair kits, covering the majority of sizes commonly in use today is available. Recoil kits contain an HSS tap, installation tools, tang break tools, drills, stainless steel inserts, and instructions, in a sturdy reusable container. Recoil problem-solving repair kits are available in single or multiple size format.

Installation Tooling

Arconic Fastening Systems also offers a selection of work arms and power tooling, including high efficiency pneumatic and electric installation tools for in-line production or repetitive maintenance situations. A range of associated tooling is available to facilitate insert installation, including manual installation tooling and manual, spring and pneumatic operated tang breakoff tools.

Taps and Gauges

Optimum results can be achieved with Recoil taps and gauges to suit hand-tapping through to volume production requirements. Using the “Go - NoGo” gauge, tapped holes can be gauged to enable a precision fit.

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How a Recoil® Insert Works

Recoil inserts are formed from high quality stainless steel wire with a diamond shaped cross section, wound to the shape of a spring thread. Once the wire is wound into a helical coil and installed into a tapped hole, it provides a permanent and wear resistant thread in the parent material that is generally stronger than the original thread. The inserts are designed to be greater in diameter than the tapped hole and compress as they are installed. This allows maximum surface contact area with the tapped thread, safely and permanently anchoring the inserts into place. The insert's compensatory action shares the load over the entire bolt and hole, increasing pull out and torque out strength. With a Recoil insert in place, load and stress are more evenly distributed over the assembly.

Where to Use Recoil Inserts

Original Equipment Manufacture

Arconic Fastening Systems offers innovative manufacturers the opportunity to design high quality product using lighter weight materials such as aluminum and magnesium alloys while still achieving high strength and reliability in the threaded fastener assembly. Recoil brand inserts are widely used by manufacturers in:

- Automotive
- Industrial Electronics
- Consumer Electronics
- Aerospace – Avionics, Engines, Airframe
- Ship Building
- Defense
- Power Generation
- Transport
- Manufacturing Equipment

Repair

When you encounter a damaged thread Recoil offers:

- Quickest and simplest method of repair to stripped or damaged threads
- A superior thread with great holding power
- Most cost-effective method of repair
- Returns thread to the original size
- Generally stronger than the original female thread

Insert Material

Recoil inserts are generally manufactured from Type 304 stainless steel (18-8), however inserts are available in a range of materials for special applications:

- Stainless Steel Grade 304 (AS7245) Austenitic Corrosion Resistant Steel For normal applications. Temperatures ranging from -195˚C – 425°C (-320°F – 800°F)
- Stainless Steel Grade 316 (AISI316) Austenitic Corrosion Resistant Steel For Marine applications up to 425°C (800°F)
- Inconel X-750 (AS7246) Nickel Alloy. For high temperature applications 425°C - 550°C (800°F - 1020°F) or where low permeability is required.
- Phosphor Bronze (DIN17677 or BS2783 PB 102) (300°C) For electrical bonding joints or low permeability
- Nimonic 90 (HR503) for high temperature applications. (650°C/1200°F)
- Nitronic 60 (UNS S21800) Austenitic antigalling alloy

Special Purpose

- Materials such as Inconel 625 and Spring Steel Grade are also available to special order

Type

There are two basic types of Recoil inserts available:

- Free running inserts which provide a standard female thread
- Locking inserts which provide a locking function for the female thread when the fasteners installed

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How a Recoil® Insert Works

Insert installation and retention

Uninstalled, Recoil inserts are greater in diameter than the tapped hole in the parent material into which they are to be installed. During the assembly operation the diameter of the leading coil is reduced thereby permitting entry of the insert into the tapped hole. When the insert is installed at the correct depth, the coils expand and permanently retains the insert in place. Unlike many 'solid' insert types, it is not necessary to use locking, swaging or keying operations to locate and retain Recoil inserts. Stress concentration problems which typically occur in the parent material when using solid inserts are therefore eliminated. A Recoil insert will dimensionally adjust both radially and axially, to any expansion or contraction within the parent material.

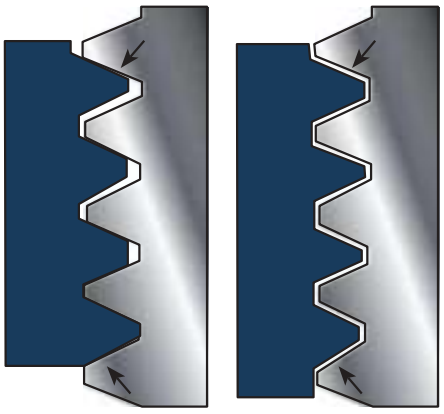
Typical thread and angle errors may cause:

- Limited contact point
- Poor flank contact between bolt to parent thread
- Unequal distribution of bolt load over engaged threads
- Failure of threaded components when loaded

Recoil inserts reduce thread pitch and angle errors to provide:

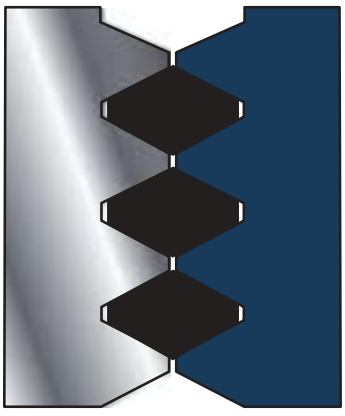
- Greater fastener strength
- Greater contact area
- Equally distributed load over all tapped threads
- Reduced stress concentration thereby extending fatigue life

Recoil insert in semi-installed position



Angle error

Pitch error



Recoil compensation effect

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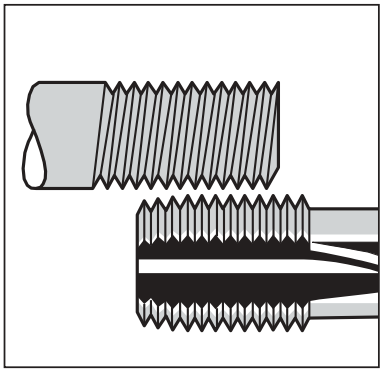
How a Recoil® Insert Works

1. DRILL

Drill to clear out the damaged thread with drill size as specified on kit (if necessary).



2. CHECK:

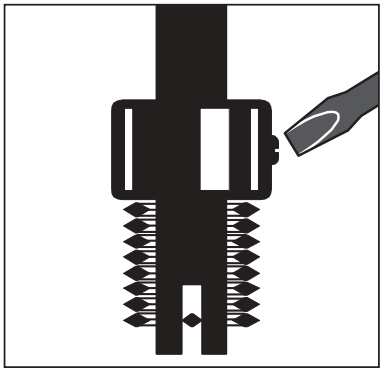
Ensure tap thread matches bolt.

3. TAP:

Place tap into tap wrench or use the square drive in the installation tool if provided. (Square drive tool only suitable for tapping non-ferrous alloys.)

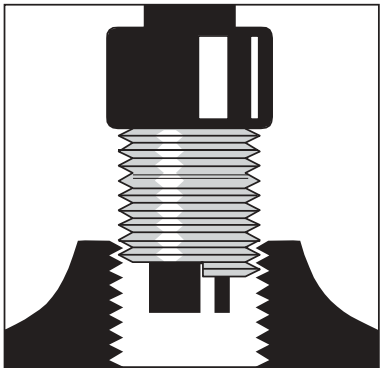
3a. TAP HOLE:

Tap hole to the required depth using correct procedures (if unsure contact your dealer).



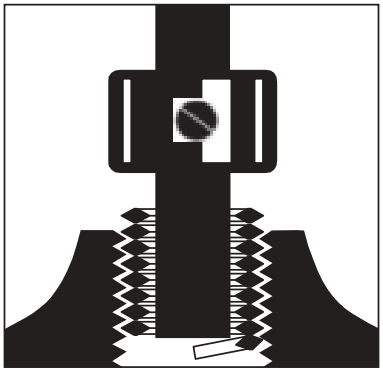
4. SET TOOL:

Place insert on installation tool, positioning the adjustable top so that the insert tang is centered in the tang slot.



5. INSTALL:

Wind insert in with light downward pressure until 1/4 to 1/2 turn below the surface.



6. TANG REMOVAL:

Do not attempt to twist tang off with tool. Lift tool from tang, turn tool 90° and tap down sharply. Use Tang Break Tool where supplied. For sparkplug and large fine thread inserts, use long nose pliers to pull tang out.