

Thread Repair Installation Procedures Guide

Tip: Always practice on scrap material first if unfamiliar with the repair process.

HeliCoil Installation (Standard with Tang)

Step 1: Assess Damage

- Verify only threads are damaged
- Check surrounding material is sound
- Ensure adequate wall thickness
- Document original thread size

Step 2: Drill Out Threads

- Use specified drill size from chart
- Drill straight and perpendicular
- Use sharp, quality drill bit
- Apply cutting fluid

Step 3: Clean the Hole

- Remove all chips and debris
- Use compressed air for blind holes
- Wipe with clean cloth
- Inspect hole walls

Step 4: Tap the Hole

- MUST use STI tap (not standard)
- Apply cutting fluid liberally
- Back out every 2 turns to break chips
- Tap 1/4 turn past insert depth

Step 5: Thread Insert on Mandrel

- Screw HeliCoil onto mandrel 3-4 threads
- Tang engages mandrel slot
- Ensure insert is not damaged

Step 6: Install Insert

- Thread insert into tapped hole
- Keep steady downward pressure
- Turn mandrel clockwise smoothly
- Do not force if binding

Step 7: Seat the Insert

- Insert should end 1/4 to 1/2 turn below surface
- Do not bottom out in blind holes
- Verify proper depth

Step 8: Break Off Tang

- Use tang break-off tool
- Snap tang at notch
- Remove tang from hole
- Test with mating bolt

⚠ CRITICAL: NEVER use standard taps for HeliCoil installation. STI taps have a different thread form. Standard taps will ruin the installation and the insert will not hold.

Tangless HeliCoil Installation

Simplified Process (No Tang to Remove)

1. **Drill and tap:** Same as standard HeliCoil—use correct drill size and STI tap
2. **Use special tool:** Tangless inserts require a different installation tool (not the standard mandrel)
3. **Install insert:** Thread insert into hole using the tangless installation tool
4. **Seat properly:** Insert should be flush or slightly recessed
5. **Test installation:** Thread in mating bolt by hand to verify

Advantages: No tang debris (ideal for blind holes), faster installation, cleaner finish

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Solid Bushing Insert Installation (Key-Locking)

Step 1: Drill to Size

- Use precision drill bit for specified size
- Drill straight and perpendicular
- Clean hole thoroughly

Step 2: Broach Keyways

- Use proper broach tool
- Cut locking keys in hole wall
- Verify keyway depth
- Keys must fully engage insert

Step 3: Prepare Insert

- Apply thread locker to external threads (optional but recommended)
- Align keys with keyway slots

Step 4: Drive Insert

- Use installation driver tool
- Apply steady, even force
- Do not use impact tools
- Seat flush or slightly below surface

Step 5: Verify Installation

- Insert should NOT rotate
- Keys lock insert in place
- Test with mating bolt
- Verify smooth thread engagement

Oversized Repair Installation

Simple Repair Process

1. **Select next size up:** Choose smallest oversize that cleans up all damage
2. **Verify clearance:** Ensure oversized hole won't interfere with other features
3. **Drill to tap drill size:** Use standard tap drill chart for new size
4. **Tap to new size:** Use standard tap (NOT STI) for oversized threads
5. **Clean threads:** Remove chips, verify thread quality
6. **Test with oversized bolt:** Thread in new size bolt by hand
7. **Apply appropriate torque:** Use torque specs for NEW thread size

Required Tools by Repair Method

Repair Method	Required Tools	Optional/Recommended
HeliCoil (Standard)	Drill bit, STI tap, installation mandrel, tang break-off tool	Cutting fluid, tap handle, depth gauge
HeliCoil (Tangless)	Drill bit, STI tap, tangless installation tool	Cutting fluid, tap handle, depth gauge
Solid Bushing (Key-Lock)	Precision drill bit, broach tool, installation driver	Thread locker, depth gauge
Oversized Repair	Drill bit, standard tap, tap handle	Cutting fluid, thread gauge
Thread Chasing	Thread chaser (file or tap type)	Thread gauge, cleaning solvent

Installation Tips:

- Use sharp, quality tools—dull bits make oversized holes
- Always use cutting fluid when tapping
- Clean chips frequently during drilling and tapping
- Test-fit before permanent installation
- Don't overtighten—can strip newly repaired threads

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