Thread Repair Troubleshooting Quick Reference

> **Tip:** Most thread repair failures result from using wrong tools or rushing the process. Take your time!

HeliCoil Installation Problems

Problem	Possible Causes	Solutions
Insert won't thread into hole	• Wrong tap used (standard vs STI) • Tap not deep enough • Chips in hole • Damaged insert	• Verify STI tap was used—standard taps won't work • Re-tap to proper depth (1/4 turn past insert length) • Clean hole thoroughly with compressed air • Inspect insert; use new one if damaged
Insert pulls out under load	• Insert too short • Parent material too weak • Oversized hole • Insufficient thread engagement	• Use longer insert (1.5D-2.0D minimum) • Consider solid bushing insert for more grip • Drill bit may have been oversized; use next size insert • Verify tap depth and insert installation depth
Bolt cross-threads in repaired hole	• Insert not straight • Insert not fully seated • Wrong thread pitch insert • Damaged insert threads	• Hole drilled at angle—must re-drill straight • Drive insert deeper until properly recessed • Verify insert matches original thread spec • Remove and install new insert
Tang won't break off	• Wrong break-off tool • Insert not fully seated • Tang damaged during install • Insert bottomed out	• Use proper tang break-off tool (not pliers) • Drive insert deeper before attempting removal • May need to drill out and start over • Re-tap deeper to allow proper seating
Insert spins when installing bolt	• Oversized drilled hole • Insufficient thread engagement • Wrong insert for application	• Use next larger insert size or key-locking insert • Use longer insert with more grip • Switch to solid bushing insert

Solid Bushing Insert Problems

Problem	Possible Causes	Solutions
Insert rotates in hole	• Keys not engaged • Keyways too shallow • Hole oversized	• Remove insert, check keyway depth, re-broach • Re-broach deeper to fully engage keys • Go to next size up insert or apply thread locker
Insert won't seat flush	• Hole not deep enough • Debris at bottom of hole • Burrs on hole edge	• Drill or tap deeper • Clean hole thoroughly • Chamfer hole edge to remove burrs
Insert cracks during installation	• Hole undersized • Excessive force used • Defective insert	• Verify hole size matches specification • Use steady pressure, not impact • Replace with new insert

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General Repair Problems

Problem	Possible Causes	Solutions
Repaired threads strip again	• Over-torquing bolt • Insert too short • Weak parent material • Thread locker dissolving insert grip	• Use torque wrench—don't exceed specifications • Use longer insert (2.0D for soft materials) • Switch to solid bushing insert • Use thread locker compatible with insert material
Hole too large after drilling	• Dull drill bit • Drill wandered • Wrong size drill used	• Use sharp, quality drill bit • Use pilot hole or drill guide • Verify drill size; go to next larger insert
Tap breaks in hole	• No cutting fluid • Forcing tap • Chips clogging flutes • Hole too shallow	• Always use cutting fluid • Back out frequently to break chips • Clean tap and hole regularly • Use tap extractor or EDM to remove broken tap
Parent material cracks during repair	• Pre-existing cracks • Material too thin • Excessive drilling force • Material brittle (cast iron)	• Inspect for cracks before starting repair • Verify wall thickness adequate for insert • Drill slowly with sharp bit • Component may need replacement

Prevention Checklist

Before Repair:

- ☐ Verify correct drill size for insert
- ☐ Confirm STI tap (not standard) for HeliCoil
- ☐ Check wall thickness is adequate
- ☐ Inspect for cracks in parent material
- ☐ Have all tools ready before starting

During Repair:

- ☐ Drill straight and perpendicular
- ☐ Use cutting fluid
- ☐ Back out tap every 2 turns
- ☐ Clean hole before inserting
- ☐ Don't force—if binding, stop and investigate

After Repair:

- ☐ Test with mating bolt by hand first
- ☐ Use torque wrench—don't over-tighten
- ☐ Document repair in maintenance log

⚠ **When Repair Fails Completely:**

- Try next larger insert size if wall thickness permits
- Switch from wire to solid bushing insert
- Consider oversized repair with larger bolt
- For critical applications—replace component
- Consult engineering before multiple repair attempts