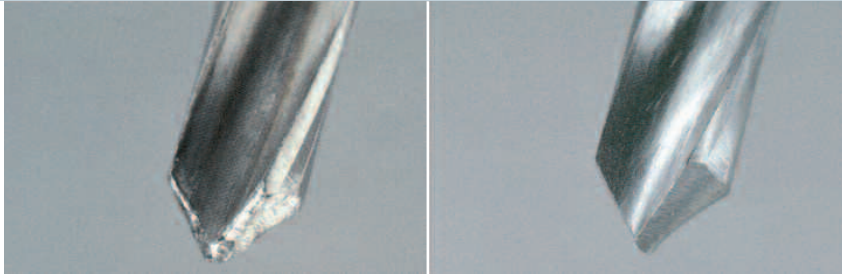
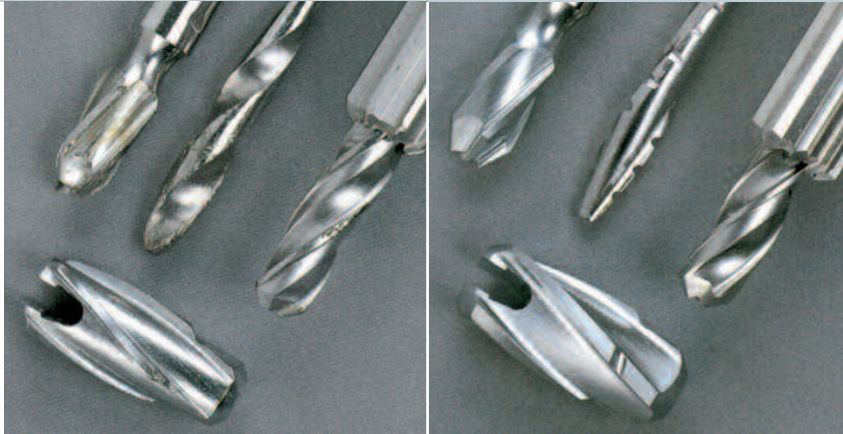


Function control

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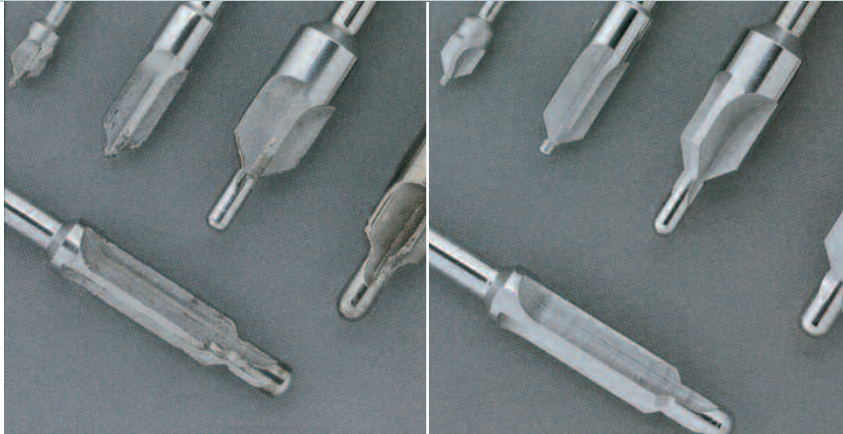
Possible damage	Prevention	Recommendations
<p>– Blunt, bent or broken drill bit, does not rotate concentrically, knocks and can thus break.</p>		



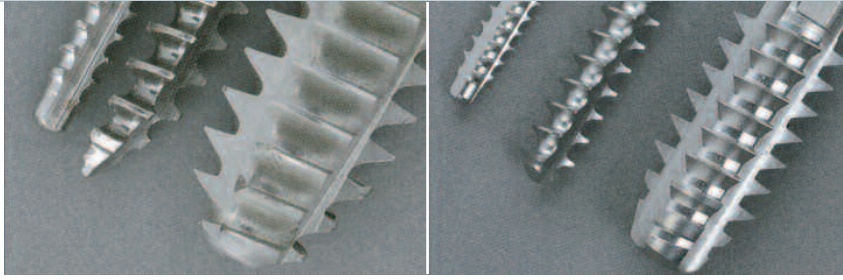
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Cutting edge damaged. - Cutting edge corners broken off. - T-groove of drilling heads damaged or broken off 		



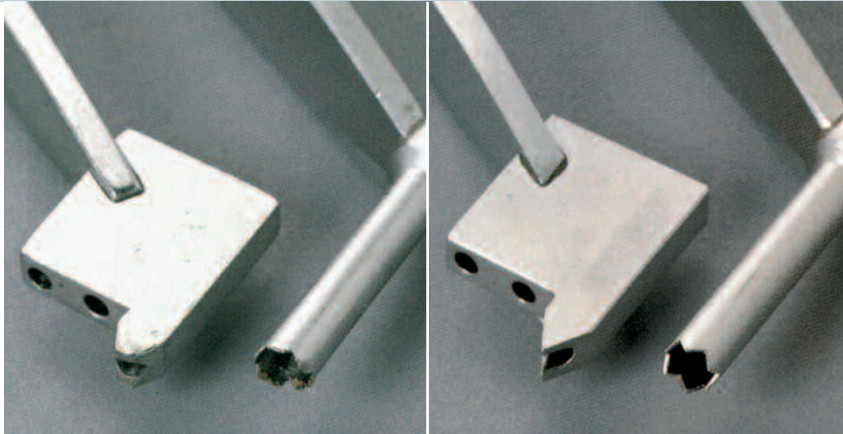
See also *Flexible shafts*.



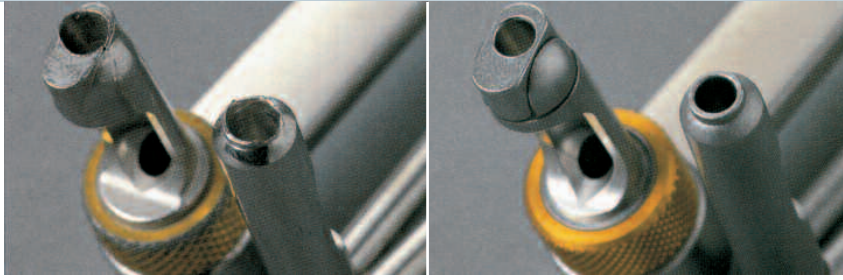
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Conical or side cutting edge damaged or blunt. 		
<ul style="list-style-type: none"> - Centering tip damaged. 		



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Thread damaged. Teeth blunt or broken. - Tap bent or twisted. 		
<ul style="list-style-type: none"> - Quick coupling end damaged. 		



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Teeth damaged or worn. 		
<ul style="list-style-type: none"> - The guide sleeve or drill cylinder bent and blocked. 		



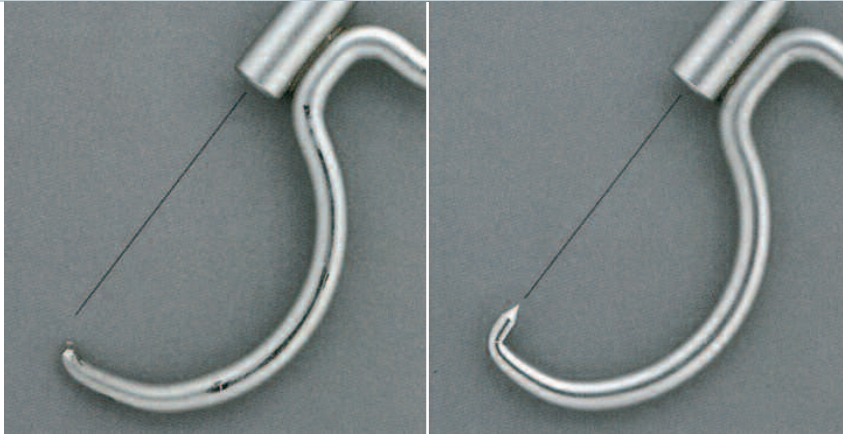
Possible damage	Prevention	Recommendation
– The base of the drill guide is damaged.		
– Guide cylinder blocked.		
	See also <i>Instruments with spring-loaded ball-bearings.</i>	



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Aiming accuracy impaired. - Tube damaged. - Hole widened. 		



See also *Instruments with cams.*



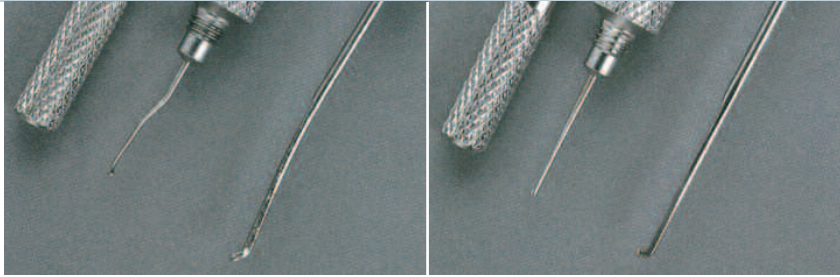
Possible damage	Prevention	Recommendations
- Alignment error. Drill guide and tip not in line.		
- Tip damaged.		
- Guide damaged by drilling.		




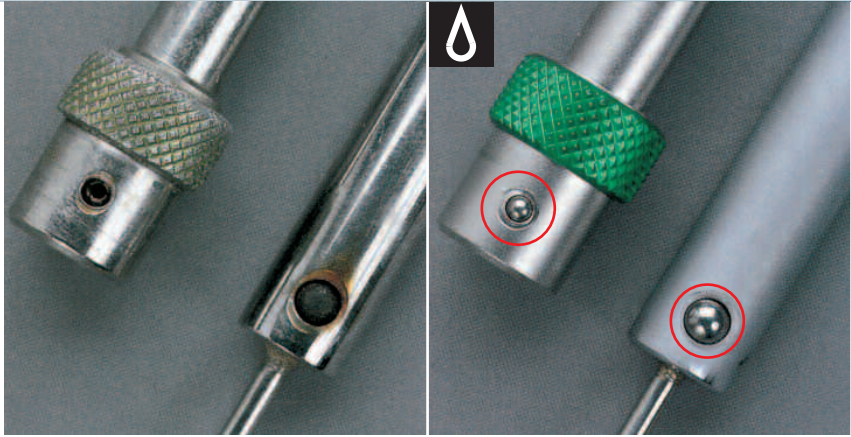
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Flexibility of coupling piece impaired or restricted. - Instrument cannot be fitted. 		



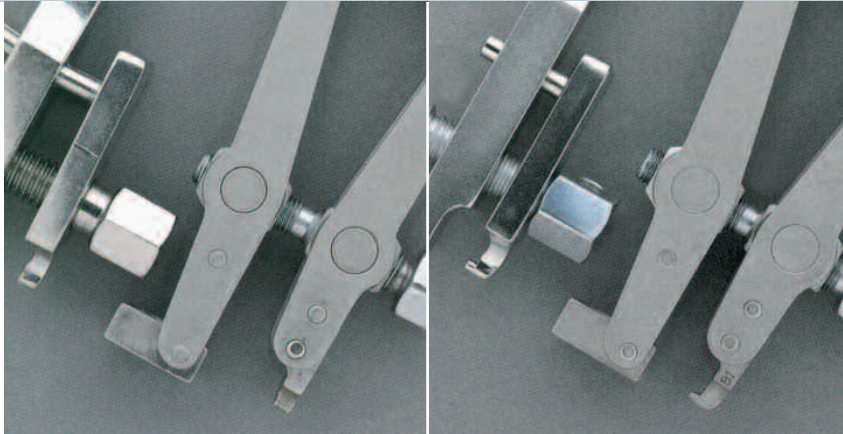
See also *Instruments with plastic handles.*



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Measuring hook bent out of alignment or broken off. 	<ul style="list-style-type: none"> - Insert gauge correctly. - Adequate care should be taken of the measuring hook. 	
<ul style="list-style-type: none"> - Scaling no longer visible. 		
 <p>See also <i>Instruments with spring-loaded ball-bearings.</i></p>		



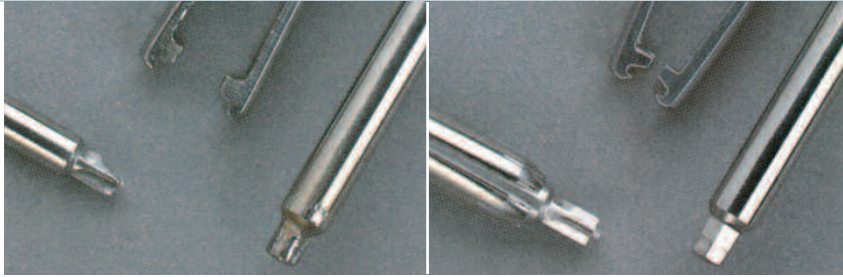
Possible damage	Prevention	Recommendations
– Ball-bearing jammed.		
– Ball-bearing lost.		



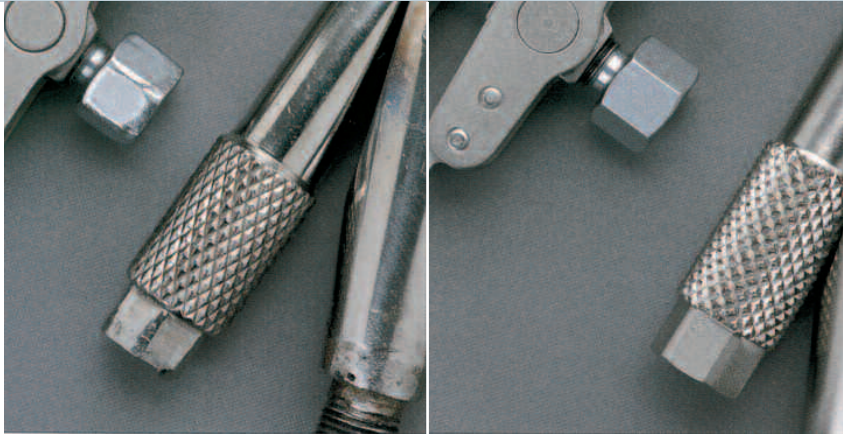
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Distraction or tensioning hooks are bent or broken. - Guide pin bent. - Hexagonal nut damaged. 		
<ul style="list-style-type: none"> - Movement of the nut is impaired. 		



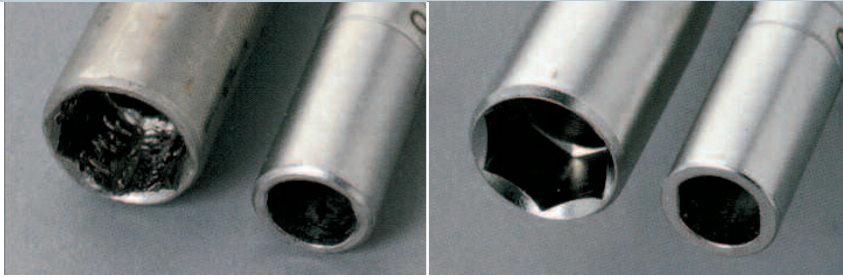
See also *Threaded instruments and Instruments with hexagon sockets or bolts.*



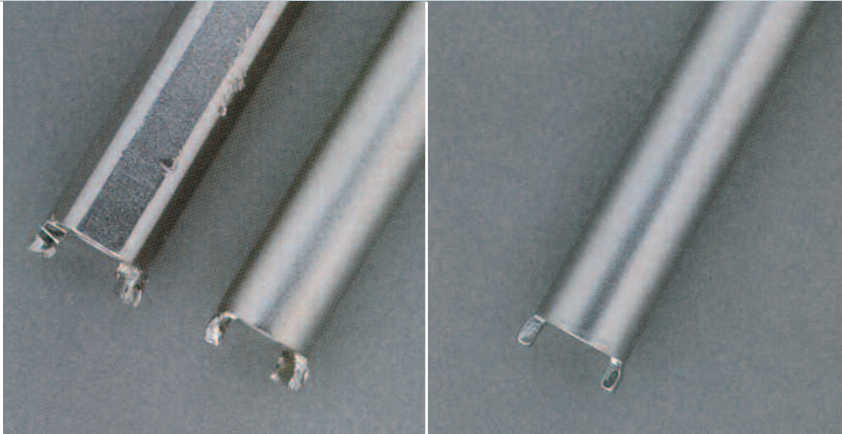
Possible damage	Prevention	Recommendations
– Hexagon head damaged.		
– Spring action or holding force of the holding sleeve ineffective; end damaged.		



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Hexagon bolt head worn or deformed. - Hexagon socket widened. 		



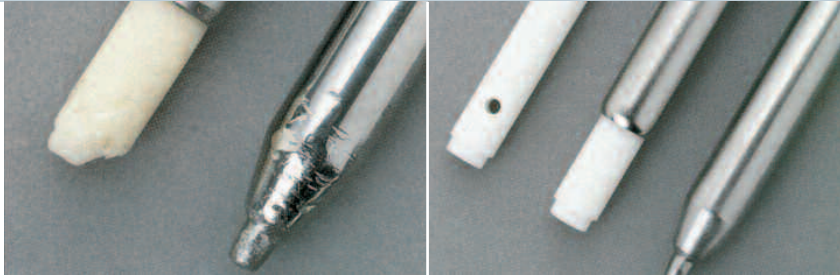
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Hexagon worn or widened. - End of open-ended or box wrench damaged. - The front end of the DHS/DCS wrench has been widened. 		



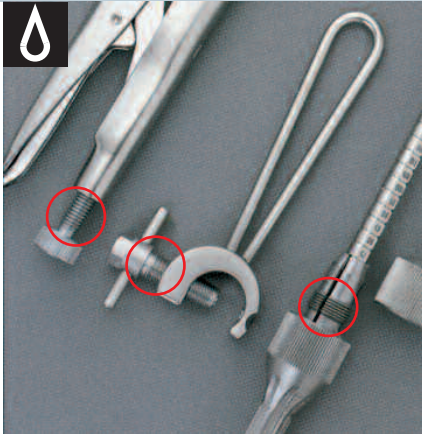
Possible damage	Prevention	Recommendations
– Cams bent, twisted or broken off.		



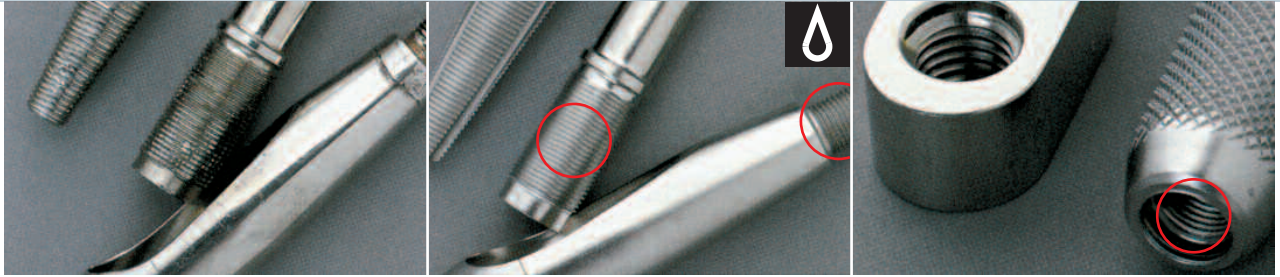
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Shank or sleeve bent or blocked. 		<ul style="list-style-type: none"> - Consult your Synthes representative in case of slightly bent instruments. Exchange badly damaged instruments.



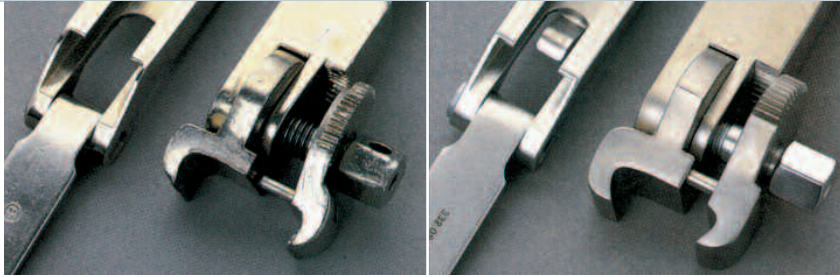
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> – Front end damaged. 	<ul style="list-style-type: none"> – Ensure that the end of impactor fits exactly into the hole of the plate before driving in the plate. – Do not tilt the instrument during impacting. – Avoid using excessive force. 	<ul style="list-style-type: none"> – Consult your Synthes representative.
<ul style="list-style-type: none"> – Plastic heads broken off. 	<ul style="list-style-type: none"> – Ensure that the end of impactor fits exactly into the hole of the plate before driving in the plate. – Do not tilt the instrument during insertion. – Avoid using excessive force. 	<ul style="list-style-type: none"> – Some plastic heads can be exchanged. Consult your Synthes representative.



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Difficulty in screwing in and unscrewing. 	<ul style="list-style-type: none"> - Lubricate regularly. 	<ul style="list-style-type: none"> - Remove any incrustations with a suitable detergent. Then carefully clean instrument and apply lubrication.
<ul style="list-style-type: none"> - Threads damaged. 	<ul style="list-style-type: none"> - Clean the threads carefully. Always fully unscrew the screws. - Do not use excessive force. 	<ul style="list-style-type: none"> - Consult your Synthes representative in the event of jammed screws.



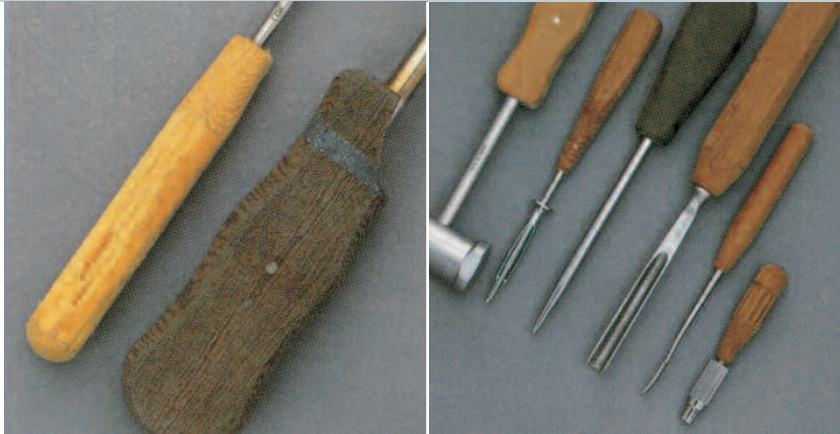
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> – Threads damaged, stripped or destroyed by hammer blows. 	<ul style="list-style-type: none"> – Ensure that the instruments are securely screwed together before use. – Do not subject the instruments to excessive force. – Do not grip threads with pliers. 	<ul style="list-style-type: none"> – Some repairs are possible. Consult your Synthes representative. Exchange any instruments which have damaged threads.
<ul style="list-style-type: none"> – Difficulty in screwing in and unscrewing. 	<ul style="list-style-type: none"> – Carefully clean and lubricate threads. – Do not grip threads with pliers 	<ul style="list-style-type: none"> – Dissolve any incrustations with a suitable substance. Then carefully clean the instrument and apply lubrication.



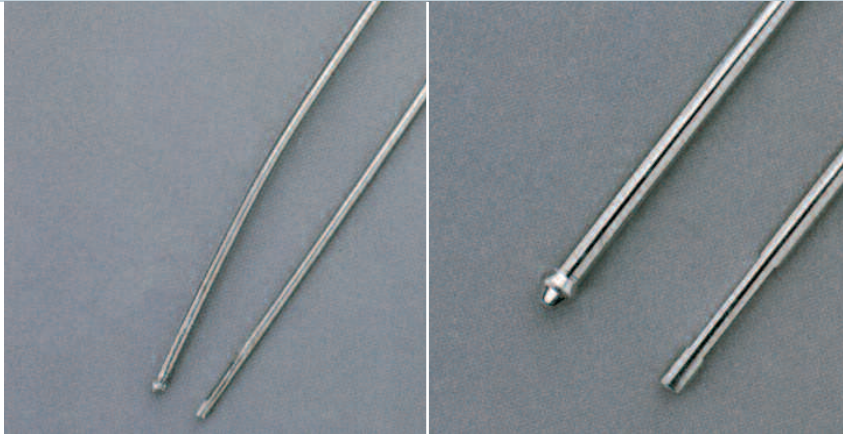
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Damaged teeth. - Instrument with jaws: jaw grippers worn or widened. 	<ul style="list-style-type: none"> - Arrange angle plates so that several teeth are engaged (if necessary, turn or shift through 180°). - Firmly tighten the locking nut. 	<ul style="list-style-type: none"> - For instruments with severe damage, consult your Synthes representative.
<ul style="list-style-type: none"> - Instrument with flat spring: flat spring of guide plate bent or broken off. 	<ul style="list-style-type: none"> - Do not bend flat springs to and fro. 	<ul style="list-style-type: none"> - If the guide plate spring no longer provides a grip, it can be slightly bent into position to regain tension.
<ul style="list-style-type: none"> - Instrument with drive pin: drive pin bent. 	<ul style="list-style-type: none"> - Do not subject drive pin to excessive force. 	<ul style="list-style-type: none"> - For instruments with severe damage, consult your Synthes representative.
<ul style="list-style-type: none"> - Instrument with guide plate: plate is deformed. 	<ul style="list-style-type: none"> - Do not subject guide plate to excessive force. 	<ul style="list-style-type: none"> - For instruments with severe damage, consult your Synthes representative.



See also *Instruments with interlocking threads and Instruments with hexagon sockets or bolt heads.*



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> – Parts cracked or broken-off. – Surface is brittle, soft or has a burnt appearance. 	<ul style="list-style-type: none"> – Do not sterilize instrument in hot air. – Avoid using excessively strong disinfectants or detergents. 	<ul style="list-style-type: none"> – Exchange damaged handles. Consult your Synthes representative.
<ul style="list-style-type: none"> – Shank is loose in the handle. 	<ul style="list-style-type: none"> – Do not drop instrument. 	<ul style="list-style-type: none"> – Exchange damaged handles. Consult your Synthes representative.



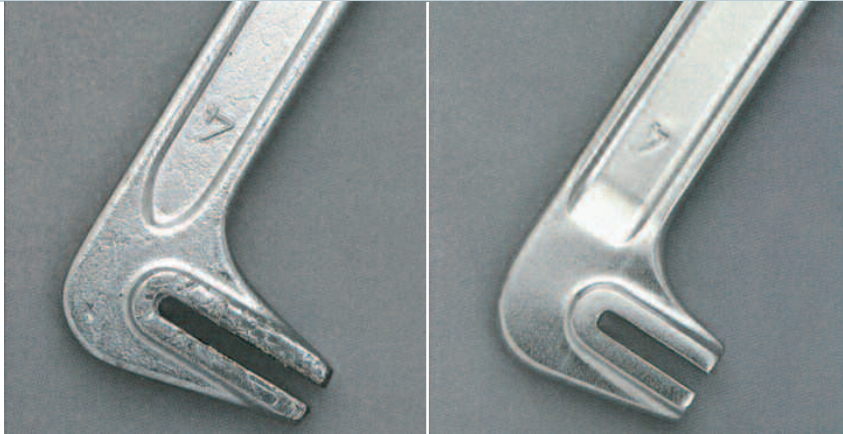
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Instrument bent, kinked or distorted. 	<ul style="list-style-type: none"> - When drilling, do not tilt the drill over guide wire or rod. - Do not apply excessive pressure during the drilling. 	<ul style="list-style-type: none"> - Straighten slightly bent instrument. Exchange severely bent instrument.
<ul style="list-style-type: none"> - Ends damaged, e.g. drilled into or twisted. 	<ul style="list-style-type: none"> - Do not damage ballpoint end of guide pin during drilling. Take care with frontally cutting drill heads! 	<ul style="list-style-type: none"> - Exchange damaged instrument.



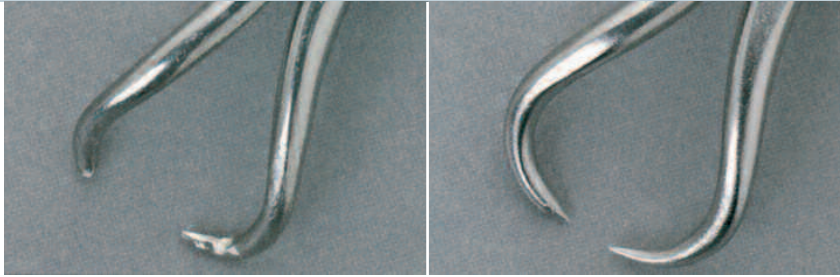
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> – Helix or shaft irregular or kinked. – Connector worn at front or rear. – Soldered point damaged. 	<ul style="list-style-type: none"> – Never reverse run a flexible shaft. – Do not apply excessive pressure while drilling. – Core drill in increments of 0.5 mm. Change shaft as required – Always core drill via the mandrel. 	<ul style="list-style-type: none"> – Some repairs are possible. Consult your Synthes representative. Exchange damaged instruments.
<ul style="list-style-type: none"> – Shaft contaminated with dried-on drillings. 	<ul style="list-style-type: none"> – During surgery, flush the shaft directly after use with Ringer-Lactate solution or saline solution. Never the leave the shaft submerged in the solution. – At the conclusion of surgery, clean the shaft by hand under water with a water jet, nozzle and detergent. Close the distal opening with a finger to force the solution through the wire walls. During cleaning, bend the shaft to and fro. Then dry with warm air. 	<ul style="list-style-type: none"> – Dissolve incrustations with suitable agent. Clean the instrument thoroughly (see <i>Prevention</i>).



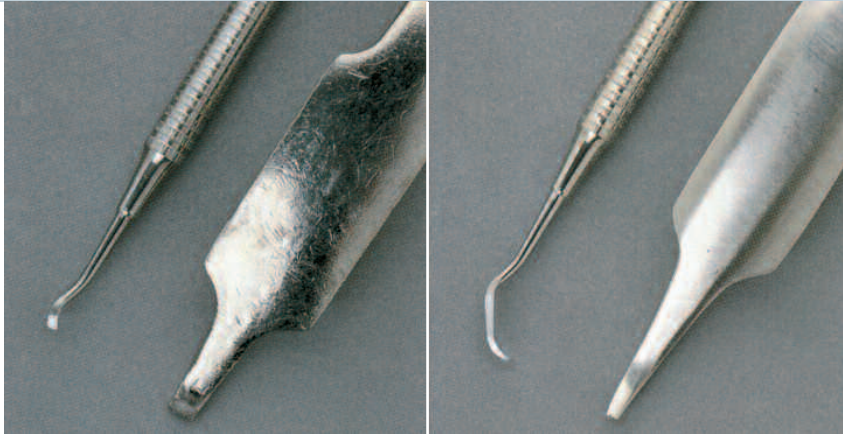
See also *Medullary reamer heads*.



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Jaws damaged or widened. 	<ul style="list-style-type: none"> - Use the irons only for twisting plates. - Do not use excessive force. 	<ul style="list-style-type: none"> - Exchange badly damaged instruments. Consult your Synthes representative.
<ul style="list-style-type: none"> - Leg or pin broken off. 	<ul style="list-style-type: none"> - Do not use excessive force. 	<ul style="list-style-type: none"> - Exchange instrument.



Possible damage	Prevention	Recommendations
– Jaws deformed or worn.	– Do not subject forceps to excessive force.	– Some repairs are possible. Consult your Synthes representative.
– Ratchet or adjuster spindle bent.	– Always use the correct size forceps according to the size of bone being held.	– Some repairs are possible. Consult your Synthes representative.
– Joint damaged or corroded.	– Carefully clean and lubricate joints.	– Some repairs are possible. Consult your Synthes representative.
– Forceps member bent.	– Sterilize instrument only with locks open.	– Some repairs are possible. Consult your Synthes representative.



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> – Tips deformed or broken off. 	<ul style="list-style-type: none"> – Do not apply excessive force to bone hooks. 	<ul style="list-style-type: none"> – Some repairs are possible. Consult your Synthes representative.

<ul style="list-style-type: none"> – Retractor accidentally drilled, bent or has sharp edges. 	<ul style="list-style-type: none"> – Do not apply excessive force to retractors. Do not drill into retractors. 	<ul style="list-style-type: none"> – Some repairs are possible. Consult your Synthes representative.
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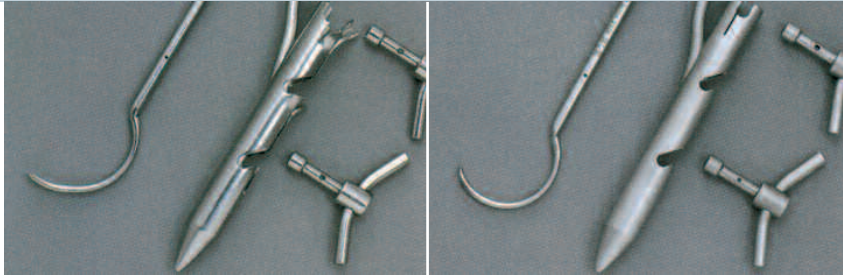


Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Cutting edges damaged, chipped or blunt. 	<ul style="list-style-type: none"> - Do not misuse instruments. The very function of these instruments means that such damage and wear is to be expected. 	<ul style="list-style-type: none"> - Regrinding is possible provided the cutting edges are not too badly damaged. Consult your Synthes representative.

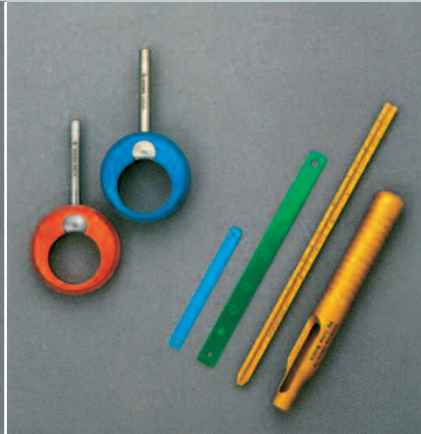


Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Cutting edges damaged. 	<ul style="list-style-type: none"> - Do not apply excessive force to pliers. - Ensure that the appropriate cutting and bending pliers are used for the various diameters of wire. - Use lubrication. 	<ul style="list-style-type: none"> - Only certain types of repair are possible. Consult your Synthes representative.

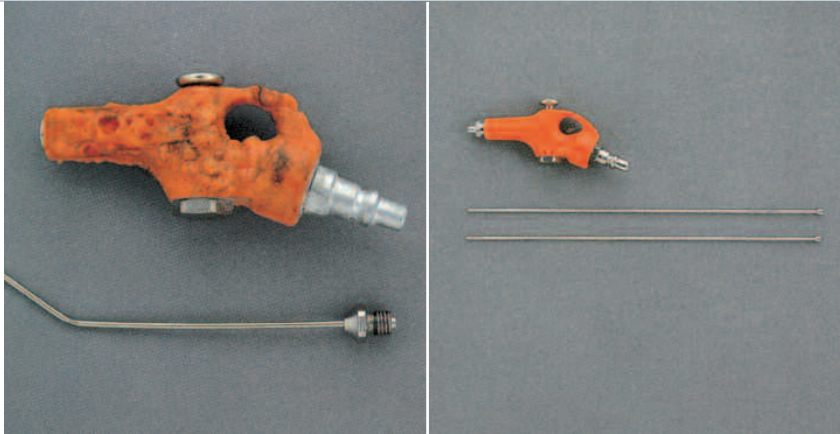
<ul style="list-style-type: none"> - Jaw deformed. 	<ul style="list-style-type: none"> - Do not apply excessive force to pliers. - Ensure that the appropriate cutting and bending pliers are used for the various diameters of wire. 	<ul style="list-style-type: none"> - Only certain types of repair are possible. Consult your Synthes representative.
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Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Wire passer bent or flattened. - Guide tube of the wire tensioner split or deformed. 	<ul style="list-style-type: none"> - Do not hold the guide tube of the wire passer with forceps. - Feed the instrument around the bone without tilting it. - Thread appropriate size Cerclage wires into the coil. - Before tightening wires, fit the coil fully into the slots in the guide tube. - Do not apply excessive force to the instrument. - Remove wire residues. 	<ul style="list-style-type: none"> - Exchange badly damaged instruments - Slightly deformed slots can be bent back into position. Consult your Synthes representative.
<ul style="list-style-type: none"> - Wire passer blocked. 	<ul style="list-style-type: none"> - Clean the tube of the wire passer thoroughly and thoroughly. 	<ul style="list-style-type: none"> - Dissolve incrustations in the tube with a suitable substance. Thoroughly clean and flush instrument.

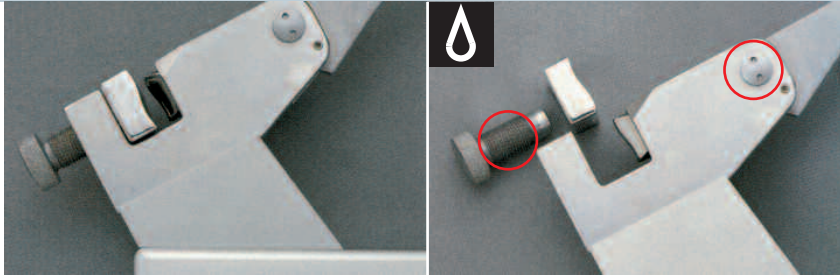


Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Anodized surface discoloured or flaky. 	<ul style="list-style-type: none"> - Do not use disinfectants or detergents containing iodine and metal salts such as mercury, or strongly alkaline solutions. 	<ul style="list-style-type: none"> - Exchange badly damaged instruments.
<ul style="list-style-type: none"> - Surface scratched. 	<ul style="list-style-type: none"> - Never use wire brushes or steel wool for cleaning. 	<ul style="list-style-type: none"> - Exchange badly damaged instruments.

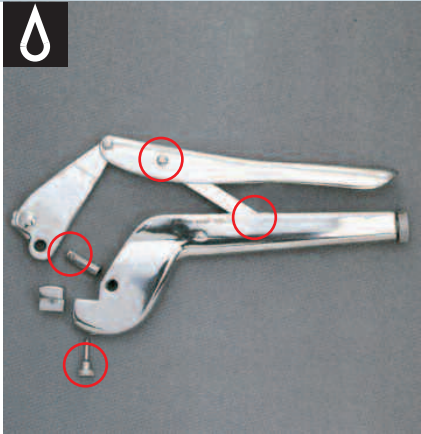


Possible damage	Prevention	Recommendations
– Plastic deformed or melted.	– Never sterilize the nozzle.	– Exchange damaged instruments.

– Tube bent, broken or blocked.	– Move the tube carefully back and forth when cleaning flexible shafts. – Rinse the air tube thoroughly after use.	– Exchange damaged instruments.
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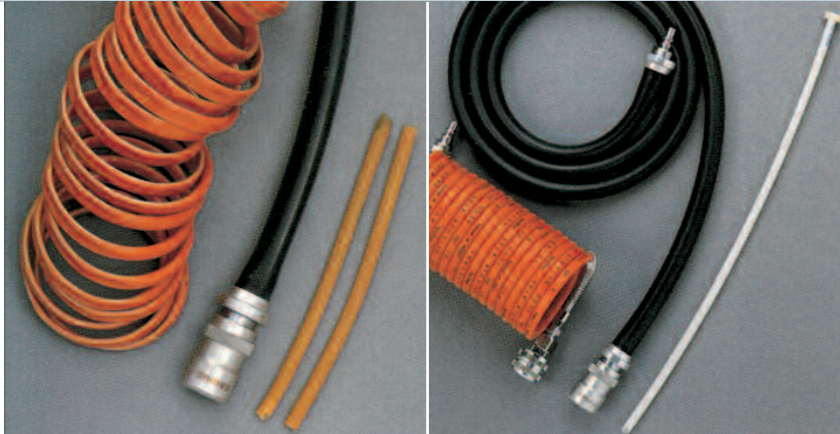
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Screw jammed or difficult to turn. 	<ul style="list-style-type: none"> - Dismantle press for cleaning (screw and anvil). - Carefully clean the thread of the adjuster screw. - Lubricate the screw, lever joint and punch. 	<ul style="list-style-type: none"> - Repair possible. Consult your Synthes representative. - Repair possible. Consult your Synthes representative.
<ul style="list-style-type: none"> - Anvil cannot be detached. - Surface damaged. - Punch damaged. - Lever stiff. 	<ul style="list-style-type: none"> - Never force adjuster screw and anvil together. Punch profile must correspond to anvil profile. 	



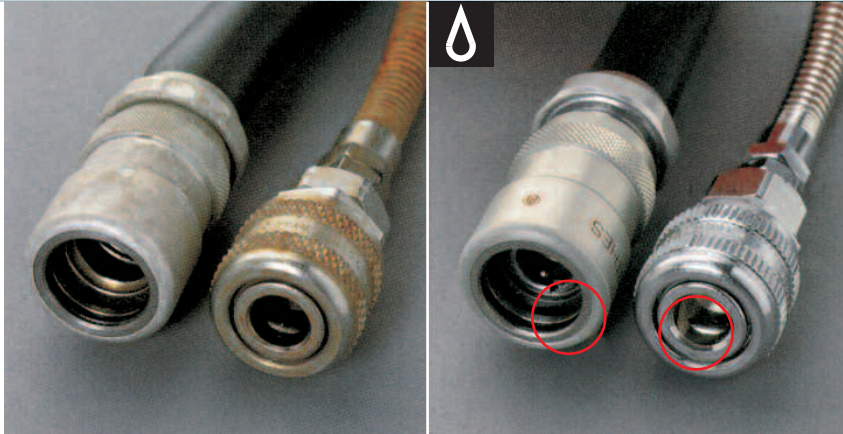
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Adjuster screw or thrust member damaged. 	<ul style="list-style-type: none"> - Dismantle the pliers when cleaning and carefully clean threaded parts. - Apply lubrication. 	<ul style="list-style-type: none"> - Some repairs possible. Consult your Synthes representative.
<ul style="list-style-type: none"> - Anvil damaged. 	<ul style="list-style-type: none"> - Use the correct size anvil according to plate size. 	<ul style="list-style-type: none"> - Exchange badly damaged pliers.



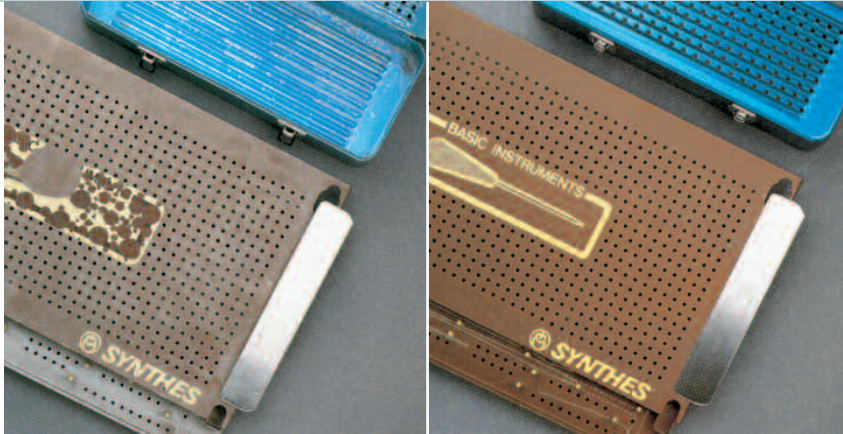
See also *Threaded instruments*.



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> – Helical or rubber hose deformed, split, soft or brittle due to overheating. 	<ul style="list-style-type: none"> – Allow hose to cool down before use. – Never lay metallic items on top of hoses during sterilization. Do not attach couplings together and never sterilize in hot air. – When disconnecting a hose, never pull on the hose itself but on the connector. – Never use a double air hose when blowing an air and oil mixture through an air drill. 	<ul style="list-style-type: none"> – Exchange instrument.
<ul style="list-style-type: none"> – Medullary tube discoloured, hard or brittle. 	<ul style="list-style-type: none"> – Check the flexibility of a plastic medullary tube regularly. Do not sterilize in hot air. 	<ul style="list-style-type: none"> – Exchange instrument.



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Sleeves difficult to move. 	<ul style="list-style-type: none"> - Clean all couplings thoroughly while moving parts. 	<ul style="list-style-type: none"> - Repairs possible. Consult your Synthes representative.
<ul style="list-style-type: none"> - Retention pins jammed or air valve blocked. 	<ul style="list-style-type: none"> - Apply lubrication. 	

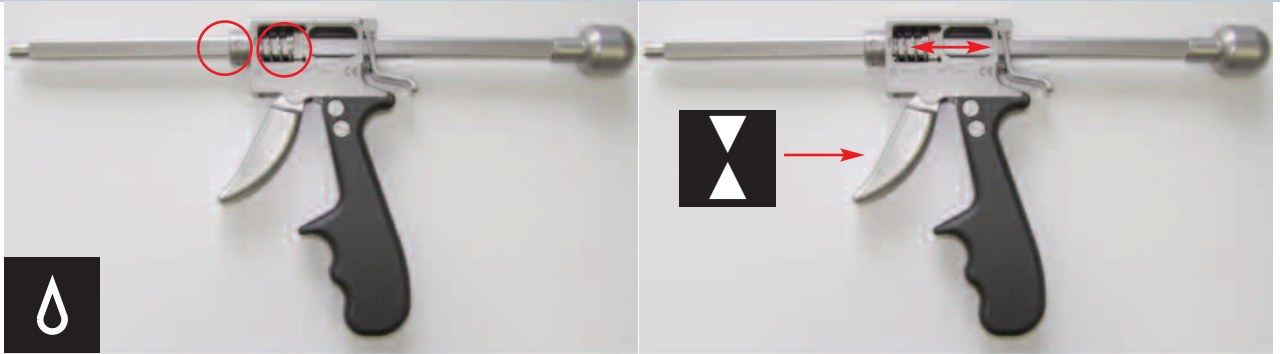


Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Surfaces discoloured, flaky or scratched. 	<ul style="list-style-type: none"> - Do not use disinfectants or detergents containing iodine or heavy-metal salts such as mercury etc. - Do not use strongly alkaline solutions. - Never use wire brushes or steel wool for cleaning. - Treat surfaces with care. Lay instruments in the cases carefully. 	<ul style="list-style-type: none"> - Exchange case if badly damaged.



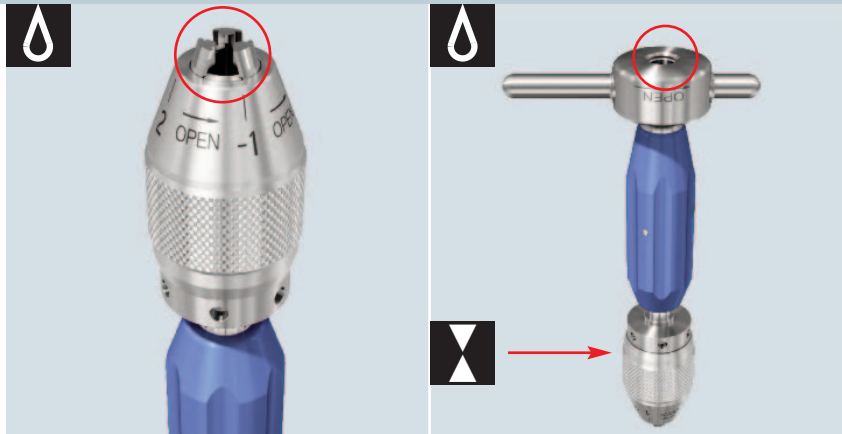
Note

Check expiry date before each application. The SynFrame holding base must not be used after the expiry date or if the insulating material is damaged. Maintenance and repair by your Synthes representative will ensure that the insulating parts are exchanged, and the holding base will be given a new expiry date.



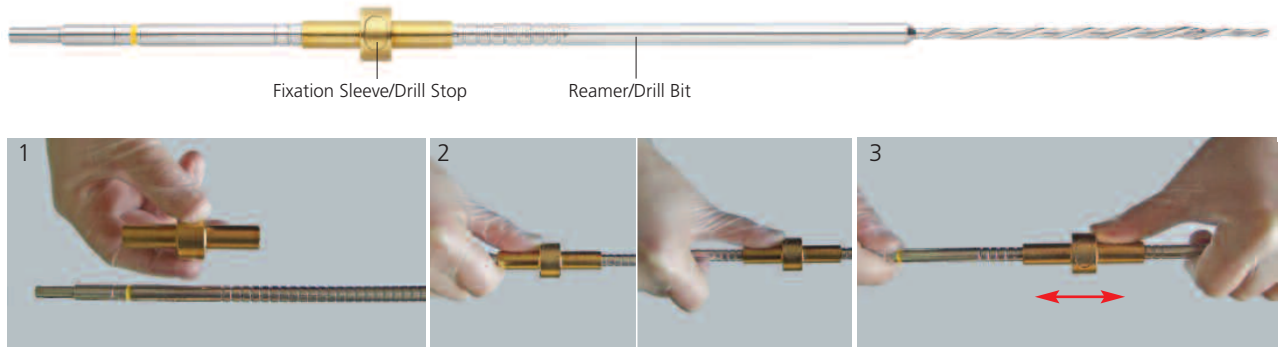
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> – Sliding mechanism does not work properly. 	<ul style="list-style-type: none"> – Lubricate regularly. 	<ul style="list-style-type: none"> – Lubricate the movable parts (e.g. clamp spring of the sliding mechanism, couplings of attachment arms) of the Collinear Reduction Clamp after each use with autoclavable Synthes oil.

	<ul style="list-style-type: none"> – Inspect instrument after each use. 	<ul style="list-style-type: none"> – Operate the handle of the instrument and check if the sliding bar moves in the correct way.
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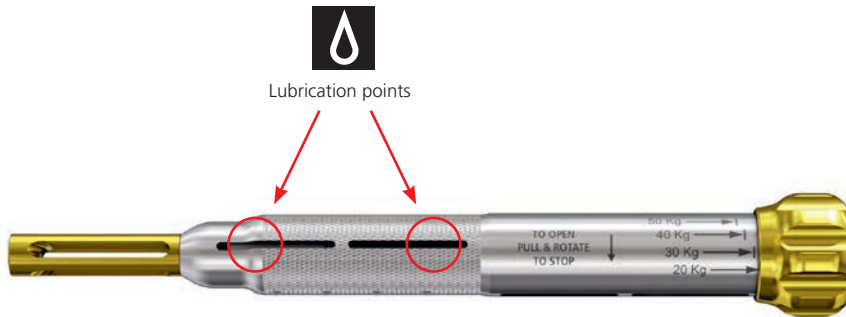
Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - Chuck jamming 	<ul style="list-style-type: none"> - Inspect chuck after and before each use 	<ul style="list-style-type: none"> - Lubricate the chuck and the cannulation at the back of the instrument previous to sterilization with autoclavable Synthes oil. - Fully open and close the chuck without implants and check its frictionless function

Fixation Sleeve/Drill Stop for Reamers and Drill Bits



Possible damage	Prevention	Recommendations
<ul style="list-style-type: none"> - The fixation sleeve allows the reamer to stop at a predetermined depth. After multiple use, however, the holding force may become insufficient and the fixation sleeve may move under pressure. 	<ul style="list-style-type: none"> - Check the stop of the fixation sleeve before use. <p>Proceeding:</p> <ol style="list-style-type: none"> 1 Slide the fixation sleeve on the reamer. 2 Press with the thumb onto the fixation sleeve without pressing the button. If the fixation sleeve moves under pressure, replace it. 3 Do the same test into the opposite direction. If the fixation sleeve moves, replace it. 	<ul style="list-style-type: none"> - Drill only under periodic image intensifier control. - While reaming, do not use excessive force. - Exchange fixation sleeves which do not pass the described test.





Possible damage	Prevention	Recommendations
– Jamming	– Inspect tensioner after and before each use	– Always lubricate collet tips (both sides) and threads with 2 to 3 drops of DePuy Synthes autoclavable oil (e.g. 519.970) after cleaning.