PNEUMATIC SYSTEMS

High-speed performance and power in a variety of applications
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DePuy Synthes Power Tools

DePuy Synthes Power Tools manufactures pneumatic and electric high performance instruments and attachments to meet the specific needs of both surgeon and staff. While the advanced design of these instruments provides unparalleled performance and reliability, it also allows for effortless assembly for the most demanding applications. No tools are required to assemble dissection tools or attachments.

All DePuy Synthes Power Tools instruments are manufactured to conform to rigorous quality standards to provide dependable performance.

Warning: Before using any of the Anspach High Speed Pneumatic Systems, it is imperative that all individuals working with the system read this operating manual. The surgeon is responsible for learning the proper techniques in the use of this system, as improper use may cause injury.

To schedule a hands-on training course, either at DePuy Synthes Power Tools or from your local DePuy Synthes Power Tools Sales Representative, call (800) 327-6887 or (561) 627-1080.

If you have any questions after reading this manual, please call the DePuy Synthes Power Tools Customer Service Department at (800) 327-6887 or (561) 627-1080.

High-Speed Pneumatic Systems

The XMAX® System sets a new standard for the ultimate combination of high power, smooth operation, low noise level, and small size. This new level of performance provides the perfect pneumatic system to handle a complete range of surgical procedures ranging from power demanding applications to the most delicate dissection. With a speed up to 80,000 rpm at 120 psi (8.3 bar) input pressure, the XMAX System is one of the quietest pneumatic handpieces available, with 35% more power than Black Max and 50% more than microMax Plus.

The Black Max, operating at 80,000 rpm at 120 psi (8.3 bar), offers smooth, controlled bone dissection.

The iMRI Instrument System provides an Intraoperative MRI compatible configuration. The iMRI Instrument System utilizes non-magnetic materials in the handpiece, attachment, and dissection tool components that have been approved for use with field strengths up to 1.5 Tesla.
**INDICATIONS**

**XMAX System**
Cutting and shaping bone

**Black Max**
Cutting and shaping bone

**iMRI Surgical Drill System**
The Anspach iMRI Surgical Drill System (including pneumatic drill motor, foot control, nosepiece attachments, and cutters), is indicated for intraoperative (non-imaging) use within a Magnetic Resonance Imaging (MRI) environment rated at 1.5 Tesla or less, for surgical cutting, shaping, and removal of bone, including bones of the skull and spine.
WARNINGS AND CAUTIONS

Warnings

⚠️ Irrigation is necessary for proper operation
Surgeon is responsible for learning proper techniques in use of equipment; improper use may cause serious injury to user or patient or damage to system.
Instrument operator and all operating room personnel must wear eye protection.
Visually inspect for damage before using; do not use if damage is evident.
Do not use if the product sterilization barrier or its packaging is compromised.
Do not use, or discontinue use of, powered equipment exhibiting excessive temperatures that can cause patient injury (necrosis) and/or user discomfort.
Use of damaged or improperly maintained power equipment and/or misused powered equipment can result in excessive temperatures.
Use caution to avoid cutting or tearing gloves while handling dissection tools.
Dissection tools must be adequately retained within attachment to prevent distal migration, which may cause injury.
Confirm attachment is proper size for dissection tool and that it is secure.
Gently pull on dissection tool shaft to ensure it is fully seated and properly installed.

Only cut visible areas unless an image intensifier is utilized.
Delicate structures in proximity to dissection must be thoroughly protected to prevent injury.
Maintain firm control of instrument at all times.
Do not bend or use as a lever.
Use a gentle tapping motion or side-to-side motion and let instrument do cutting.
Do not use excessive force.
Forceful side loading of dissection tool may cause fracture of dissection tool, which may cause injury.
Dissection tools are disposable and intended for single patient use only. Do not resterilize and/or reuse dissection tools.
Use standard protocol for disposal of sharp instruments.
Continuous extreme cutting at or near stalling conditions will quickly overheat handpiece.
Do not operate in an explosive flammable environment.
Do not use in oxygen-rich environment.
Dispose of items contaminated with body fluids or other biohazardous waste.
At end of life, recycle or dispose of device in accordance with local and national regulations.

Cautions

United States Federal law restricts this device to sale by or on order of a physician or other licensed healthcare provider.
Do not use accessories other than those provided by DePuy Synthes Power Tools and specified for use with DePuy Synthes Power Tools systems.
Use care to protect hose when handling, cleaning, and during system use.
Damage to hose can cause leaking, rupture, or other related failures.

Do not step on, set equipment on, pinch, kink, clamp, or otherwise occlude handpiece hose during use.
To ensure equipment operates as designed, read and follow manufacturer’s instructions.
Do not operate handpiece without an attachment and the corresponding dissection tool.
Do not engage safety mechanism while handpiece is running; doing so makes safety mechanism inoperable.
### TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>BM</th>
<th>Black Max Specifications*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>up to 80,000 rpm</td>
</tr>
<tr>
<td>Handpiece, muffler, hose</td>
<td>3.81 m (12.50 ft)</td>
</tr>
<tr>
<td>Outside housing (diameter)</td>
<td>19.05 mm (0.75 in)</td>
</tr>
<tr>
<td>Length of housing</td>
<td>91.44 mm (3.60 in)</td>
</tr>
<tr>
<td>Handpiece weight</td>
<td>70.0 g (2.6 oz)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XM</th>
<th>XMAX System Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>up to 80,000 rpm</td>
</tr>
<tr>
<td>Handpiece, muffler, hose</td>
<td>3.81 m (12.50 ft)</td>
</tr>
<tr>
<td>Outside housing (diameter)</td>
<td>17.53 mm (0.69 in)</td>
</tr>
<tr>
<td>Length of housing</td>
<td>102.36 mm (4.03 in)</td>
</tr>
<tr>
<td>Handpiece weight</td>
<td>75.30 g (2.7 oz)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMRI</th>
<th>iMRI Handpiece</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>10,000-75,000 rpm</td>
</tr>
<tr>
<td>Handpiece and hose</td>
<td>3.81 m (12.50 ft)</td>
</tr>
<tr>
<td>Outside housing (diameter)</td>
<td>17.53 mm (0.69 in)</td>
</tr>
<tr>
<td>Length of housing</td>
<td>101.60 mm (4.00 in)</td>
</tr>
</tbody>
</table>

**Patent Information**
For patent information go to: [www.DePuy.com/patentmarking](http://www.DePuy.com/patentmarking)

**Additional Information**
All specifications are subject to change.

This device complies with applicable EEC directives.

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* The DePuy Synthes Power Tools Black Max Instrument System is not sponsored by, endorsed by, or otherwise associated with United States Manufacturing Corp. or its Blackmax prosthetic limbs.
## Glossary of Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Sec ON/30 Sec OFF</td>
<td>Duty Cycle of the DRIVER</td>
</tr>
<tr>
<td>Company Logo</td>
<td></td>
</tr>
<tr>
<td>Direction of rotation</td>
<td></td>
</tr>
<tr>
<td>Direction of rotation for lock position</td>
<td></td>
</tr>
<tr>
<td>Indicates setting, position, or location</td>
<td></td>
</tr>
<tr>
<td>Indicates setting, position, or location</td>
<td></td>
</tr>
<tr>
<td>Indicates the drill tip exposure</td>
<td></td>
</tr>
<tr>
<td>Indicates the attachment setting. Refer to MA-D20 and MA-DRIVER section in this document for further details</td>
<td></td>
</tr>
<tr>
<td>Indicates position or location</td>
<td></td>
</tr>
<tr>
<td>Indicates position or location</td>
<td></td>
</tr>
<tr>
<td>Indicates action of rotation and position for Secure (LOCK) and Release (UNLOCK)</td>
<td></td>
</tr>
<tr>
<td>Direction of rotation</td>
<td></td>
</tr>
<tr>
<td>Direction of rotation for lock position</td>
<td></td>
</tr>
<tr>
<td>Direction of rotation</td>
<td></td>
</tr>
<tr>
<td>Located on the Handpiece this indicates position of the knurl knob to the desired location</td>
<td></td>
</tr>
<tr>
<td>Symbol with yellow background: CAUTION: Refer to accompanying documentation</td>
<td></td>
</tr>
<tr>
<td>Consult Operating Instructions</td>
<td></td>
</tr>
<tr>
<td>Temperature Limits</td>
<td></td>
</tr>
<tr>
<td>Reference Number (aka, Item Number, Catalog Number, Part Number)</td>
<td></td>
</tr>
<tr>
<td>Lot (aka, Lot Number, Batch Number, Batch Code)</td>
<td></td>
</tr>
<tr>
<td>Serial Number</td>
<td></td>
</tr>
<tr>
<td>Single Use Only (aka, Do Not Reuse)</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Authorized European Union Representative</td>
<td></td>
</tr>
<tr>
<td>Sterilized Using Irradiation</td>
<td></td>
</tr>
<tr>
<td>Use By Date (aka, Do Not Reuse)</td>
<td></td>
</tr>
<tr>
<td>CAUTION: Refer to accompanying documentation</td>
<td></td>
</tr>
<tr>
<td>Keep Dry (aka, Protect from Moisture)</td>
<td></td>
</tr>
<tr>
<td>Sterile unless damaged or open</td>
<td></td>
</tr>
<tr>
<td>United States Federal law restricts this device to sale by or on the order of a physician or other licensed health-care provider</td>
<td></td>
</tr>
<tr>
<td>CE Mark (aka, CE Mark [notified body number], Conformité Européenne) Meaning: Device complies with applicable EEC Directives</td>
<td></td>
</tr>
</tbody>
</table>
Certified/Accredited Test House

- Lock (Run)

- Unlock (Load)

- Product warranty is void if seal is damaged or removed.

- Humidity Limits

**Instrument System Key**

- BM Black Max
- XM XMAX System
- IMRI IMRI

**Latex-free Certification**

Products not made with natural rubber latex.
AUTOLUBE III OPERATING INSTRUCTIONS
(FOR BLACK MAX AND XMAX® SYSTEM)

ASSEMBLY PROCEDURES OF AUTOLUBE III AND HANDPIECE

AUTOLUBE III Foot Control
For additional part numbers, refer to the “Ordering Information” section.

1. Remove the red plug (installed for shipping only) from the recirculating bowl located on the top of the AutoLube III.
2. Turn the silver handle located on the back of the AutoLube III to the “OPEN” position.
3. While maintaining the handle in the “OPEN” position, insert the muffler end of the pneumatic handpiece into the cavity located on top of the recirculating bowl.
4. Insert the muffler until the red ring on the muffler cannot be seen.
5. Rotate silver handle to the “LOCK” position. Check for secure engagement.

Operating Pressure
Anspach pneumatic handpieces run on air or medical grade nitrogen. Standard operating pressure is 90–120 psi (6.2–8.3 bar). If more or less power is desired, the psi may be regulated between 40 and 140 psi (2.8 and 9.6 bar).

1. Connect the air hose from the AutoLube III to the hospital air source, nitrogen tank or hospital nitrogen system.
2. Adjust the air source until the desired air pressure registers on the gauge of the AutoLube III. Pressure will not register on the AutoLube III until the muffler is inserted and the foot pedal is activated.
3. The wall/nitrogen tank pressure may read as much as 40 psi higher than the Autolube III gauge.

Note: Handpiece is fully functional at this time.

Special Operating Pressures for Attachments:
B-ORANGE-45 run at 40 psi (2.8 bar)
B-ORANGE-90 run at 40 psi (2.8 bar)

Special Operating Pressures for Dissection Tools:
SIL-DS-A run at 70 psi (4.8 bar)
SHD-DS-A run at 70 psi (4.8 bar)
AutoLube III Operating Instructions
Assembly Procedures of AutoLube III and Handpiece

Pressure Relief Valve

Note: Handpiece hose may include a pressure relief valve to remove excess pressure in the case of hose occlusion between the AutoLube and the valve. If the pressure relief valve is actuated during use, remove the source of the occlusion. Do not attempt to disassemble the pressure relief valve.

AutoLube Lubrication

OIL-II Instrument Oil with 1 Replacement Filter

Note: The AutoLube III has been delivered without oil or a filter installed. A bottle of Anspach lubricating oil, filter, and muffler have been shipped with the unit and must be added to the AutoLube III prior to use.

1. Before adding oil, disconnect the AutoLube III from the air source.
2. Remove Oil Fill Cap from the top of the AutoLube III and fill with Anspach lubricating instrument oil (OIL-II).

Do not fill above the “MAX” oil level line next to the oil reservoir. Always replace the oil fill cap securely. One full bottle of Anspach lubricating oil should be added when the oil level reaches the “MIN” oil level line etched next to the oil reservoir.

AutoLube III Lubrication
AutoLube Lubrication, continued

3. Before each use, a visual check of the oil reservoir should be made to ensure there will be an adequate supply of oil to circulate throughout the procedure.

4. Install filter and muffler following “AutoLube III Filter” section.

**Note:** Always store and transport AutoLube III in an upright position.

**AutoLube III Filter**

FILTER-II AutoLube II and III Filters (5/pkg.)

The filter, muffler filter, and vented cover have been packed separately in the AutoLube III box. The filters should be changed each time a bottle of Anspach lubricating oil is added.

1. Insert the filter by taking the tab and sliding the “horseshoe” shaped portion of the filter into the cavity in a downward motion. The tab will extend out of the cavity.
2. Push muffler filter into vented cover with the hole in muffler filter centered over the attachment screw. The muffler is oversized and must be compressed to fit.
3. Place the vented cover over the filter cavity and secure by turning the grey wingnut in a clockwise direction.
Operation

Caution: Firm control of the Black Max must be maintained at all times. Never force the dissection tool. Let the instrument do the cutting. Never use the attachments as a retractor to bend or pry.

Only Anspach Black Max dissection tools should be used with the Black Max.

Warning: Always use continuous irrigation to prevent heat build-up.

Always wear personal protection equipment.

Black Max Directional Features

The words “SECURE” and “RELEASE” engraved on the side of the Black Max handpiece refer to the locking and unlocking the attachment onto the handpiece.

The Lever, located on the top of the handpiece, is used to lock and unlock dissection tools within the handpiece.

Caution: If the dissection tool is not inserted properly, the Lever will not secure the dissection tool. Do not force the Lever. For instructions on attachment assembly, refer to the specific instructions for each attachment in this manual.
The XMAX System Handpieces

XMAX  XMAX Handpiece
XMAX-H  XMAX Handpiece, High Strength Hose

Operation

Caution: Firm control of the handpiece must be maintained at all times. Never force the dissection tool. Let the instrument do the cutting. Never use the attachments as a retractor to bend or pry.

Only Anspach XMAX System dissection tools should be used with the XMAX System.

Warning: Always use continuous irrigation to prevent heat build-up.

Always wear personal protection equipment.

XM

XMAX System Directional Arrows

Notice the directional arrows and printing on the distal end of the handpiece housing: “RUN” ( ), “LOAD” ( ), and “SAFE.” These terms refer to locking and unlocking the attachment and dissection tool onto the handpiece (Figure 1).

For instructions on attachment assembly, refer to the specific instructions for each attachment in this manual.
IMRI INSTRUMENT SYSTEM

<table>
<thead>
<tr>
<th>iMRI Instrument System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMRI-MOTOR</td>
<td>IMRI Motor</td>
</tr>
<tr>
<td>IMRI-FOOT-CTRL</td>
<td>IMRI Air Control</td>
</tr>
<tr>
<td>IMRI-SHORT</td>
<td>IMRI Short Attachment</td>
</tr>
<tr>
<td>IMRI-SHORT-HD</td>
<td>IMRI Short HD Attachment</td>
</tr>
<tr>
<td>IMRI-CRANI-A</td>
<td>IMRI Crani-A Attachment</td>
</tr>
<tr>
<td>IMRI-OIL</td>
<td>IMRI Synthetic Oil</td>
</tr>
</tbody>
</table>

For additional components, refer to page 39.

Use, Care, and Operating Instructions

Warning: Do not use any attachments or dissection tools with iMRI handpiece not manufactured by Anspach, or not identified as “iMRI.” Do not operate handpiece without attachment and dissection tool installed.

Read and understand thoroughly before operating your new iMRI Instrument System. Failure to do so could lead to injury to you or your patient or cause severe damage to this equipment.

The iMRI Instrument System is a design modification of the Anspach microMax System. Refer to the “XMax Operating Instructions” section for additional assembly instructions.

iMRI System and dissection tools are constructed of materials that permit intraoperative use in an intraoperative magnetic resonance imaging unit rated at 1.5 Tesla or less and only when intraoperative magnetic resonance imaging is not being used for actual imaging purposes.

Caution: Do not use in intraoperative magnetic resonance imaging units rated at greater than 1.5 Tesla. Remove iMRI System from intraoperative magnetic resonance imaging volume during imaging. Failure to do so could result in unacceptable image noise and/or distortion.

Testing of iMRI System as established by ASTM F2213-02 “Standard Test Method for Measurement of Magnetically Induced Torque on Passive Implants in Magnetic Resonance Environment” and F2052-02 “Standard Test Method for Measurement of Magnetically Induced Displacement Force on Medical Devices in Magnetic Resonance Environment” confirm there is no detectable magnetically induced torque on handpiece at 1.5 Tesla (when tested in a 1.5T magnet) and only slight deflection force (10° with 18% of force due to gravity) when subjected to a high field strength and high field gradient location (1.5 Tesla) when tested in a Siemens 1.5T Magnetom Symphony, Maestro Class Unit.

iMRI System is designed for surgical procedures typically involving no more than 15 minutes of continuous (actively drilling) operation. If a procedure is expected to last longer, you should be aware handpiece speed and temperature may be affected.

Normal speed of iMRI System will be less than XMax due to magnetic effects and because iMRI System does not have continuous oiling. The lower speed will not adversely affect your ability to perform procedures and you will experience little-to-no magnetic pull on handpiece during use. However, the following effects may be noted:
1. Handpiece speed will slow when handpiece rotating mechanism is held 90° to magnetic field.
2. Handpiece temperature will increase when handpiece is held in 90° position for greater than 5 minutes. Handpiece should not become uncomfortably warm during normal use; procedures lasting greater than 15 minutes could cause handpiece temperature to rise.
3. Lock mechanisms of iMRI System and dissection tools are essentially the same as XMax. However, to help prevent unintended use of non-iMRI devices, geometry has been slightly modified to prohibit attachment of non-iMRI handpiece compatible devices.
Caution: Attempts to attach components other than iMRI System accessories to iMRI handpiece could result in significant damage to iMRI Handpiece.

Straight attachments should be used for no more than 10 procedures. Craniotome attachments should be used for no more than five procedures. Attachments are not repairable and should be replaced after the recommended number of uses.

Metal component parts of iMRI handpiece and attachments, and all iMRI dissection tools, are constructed of materials mostly unaffected by magnetic properties of iMRI. However, these materials have significantly less hardness, which directly affects durability. Proper use, cleaning, maintenance, and preoperative inspection will help ensure safe use and prolong useful life of iMRI handpiece and attachments. Periodic routine servicing by Anspach is strongly recommended.

iMRI dissection tools will dull more quickly than standard dissection tools because they are manufactured of nonmagnetic reactive material. Use with iMRI only. During surgical use, you should remain cognizant of cutter performance and have additional dissection tools available at all times. Continued use of dull dissection tools, in addition to possible necroses, may put additional stress on attachment and handpiece, leading to premature failure of those devices. Before each use, assemble system and test to ensure proper performance.

Proper system performance is usually indicated when there is no unusual difficulty in attaching attachments and dissection tools, and when system operates at full speed (unloaded with dissection tools attached) with no unusual noise, vibration, wobble, or whipping.

Caution: Carefully inspect handpiece and attachments postcleaning and again preoperatively to ensure there is no corrosion or remaining debris that could adversely affect operation or lead to attachment bearing failure during use.

Continued use of damaged or worn handpiece or attachments can lead to bearing (or other) failures, which can result in foreign debris entering surgical wound site. Never reprocess or reuse iMRI dissection tools. iMRI dissection tools must be properly disposed of after a single use.
iMRI Operating Instructions

**Caution:** Do not run handpiece without dissection tool and attachment installed.

1. Foot control must be placed on floor within reach of surgeon. Foot control is not subject to sterilization so should never be placed such that sterile field is compromised.

2. Place three drops of IMRI-OIL into muffler end of iMRI handpiece hose assembly. Do not exceed three drops.

**Caution:** IMRI OIL is for use with iMRI handpiece only. Do not use with other Anspach “AutoLube” systems. IMRI OIL used in AutoLube can damage the sight window, resulting in oil leakage.

3. Connect muffler end of hose to foot control and inspect handpiece to ensure it is “iMRI” and that internal aspect of handpiece is free of damage or debris.

**Caution:** Do not run handpiece without dissection tool and attachment installed. Damage to handpiece may result if handpiece is operated without dissection tools and attachment installed.

4. Select appropriate attachment. Inspect for any signs of corrosion or damage and ensure it is “iMRI.” Attach attachment to handpiece and turn clockwise to lock onto handpiece. Verify locking by pulling on attachment.

5. Select appropriate dissection tools and following all established sterile techniques, remove it from its packaging, insert it into and through attachment, into handpiece and lock into place. Verify locking by pulling on dissection tools. If using craniotome, dissection tool should be put into handpiece first, then put craniotome over dissection tools.

6. Attach iMRI foot control to air (or nitrogen) supply. Fully depress foot pedal and adjust supply air pressure such that gauge on foot control indicates 120 psi.

7. With handpiece in intraoperative magnetic resonance imaging field but away from patient, fully depress foot control and assess handpiece for noise, vibration, wobble, and whipping. If assembly was without difficulty and handpiece sounds and feels right, initiate or continue with use.

8. During procedure, continuously assess cutting effectiveness. Though iMRI dissection tools are designed to cut effectively, they are constructed of a much softer metal than standard (non-iMRI) Anspach dissection tools that you may be accustomed to. Because of material softness, iMRI dissection tools will dull more quickly. If you notice a reduction in cutting effectiveness, stop and replace dissection tools.

**Warnings**

- Do not reprocess or use reprocessed dissection tools. iMRI dissection tools are constructed of stainless steel that is subject to dulling and possible distortion during initial use. Reprocessors may not be able to reprocess dissection tools to their original design condition and reuse could result in excessive whipping or vibration that could cause severe patient injury including death. Reprocessed dissection tools may also be duller than new dissection tools, resulting in less effective use and possible overheating causing necrosis of tissues and/or surgeon discomfort.

- Continued use of dull dissection tools can cause user to apply greater pressure while cutting, which can seriously damage attachment, and possible bearing failure. Bearing failure can result in foreign debris entering surgical wound site.

- iMRI craniotome is constructed of a softer metal than a non-iMRI craniotome and excessively applied force will cause craniotome leg/foot to bend or fracture. Do not bend attachment or use craniotome as a lever. Do not force dissection tools. Forceful side load may cause dissection tools fracture, which could cause injury. It can also result in handpiece speed reduction and increased temperature.

9. During surgical procedure, when IMRI is used for actual imaging, remove iMRI System and dissection tools from imaging volume.
Black Max Dissection Tool Identification

All dissection tools are packaged sterile, unless otherwise indicated, and are manufactured for single use. Each dissection tool has a series of identification numbers and letters imprinted on the label and on the shaft. The first group of letters and numbers designate the part number, the second group of letters and numbers designate the lot number. Each attachment is laser-marked with its corresponding part number.

Black Max Straight Attachments

Refer to “Ordering Information” section for part numbers.
1. Lift Lever on handpiece. Align notch on attachment with “RELEASE” on side of Black Max handpiece. Turn attachment so notch is aligned with word “SECURE.”
2. Insert dissection tool into attachment. Return Lever on Black Max handpiece to down position.
3. Pull dissection tool to ensure proper engagement.
4. Adjust air source until desired air pressure registers on AutoLube gauge.

Notes
- Air pressure will not register until foot pedal is depressed.
- Handpiece is now fully functional.

The operating pressure is 120 psi (8.3 bar), as indicated on the AutoLube gauge, when using these attachments, except for those specified in “AutoLube III Operating Instructions” section.

Black Max Contra and Right Angle Attachments

B-ORANGE-45 Contra Angle Attachment (Multiple Angle)
B-ORANGE-90 Right Angle Attachment (90°)

1. Lift Lever on handpiece. Align notch on attachment with “RELEASE” on side of Black Max handpiece. Turn attachment so notch is aligned with word “SECURE.”
2. Push latch on the distal end of the attachment up with your thumb.
3. Insert dissection tool into the side of the distal end (opposite side of latch) while rotating slowly until dissection tool seats.
4. Release latch and check security of attachment by pulling it away from handpiece and check dissection tool by pulling on dissection tool head. Latch will be flush with attachment when dissection tool is secure.

Notes
- The operating pressure for these attachments is 40 psi (2.8 bar).
- Handpiece is now fully functional.

The first group of upper case letters of the dissection tool part number correspond to the attachment’s color-coded ring and/or name and the last digit represents the dissection tool style.

For example:
Black Max Dissection Tool Part Number: SIL-8
Dissection Tool Description: #8 style dissection tool used with the B-SILVER attachment.
**Black Max Craniotome and Specialty Attachments**

Refer to “Ordering Information” section for part numbers.

2. Slide attachment over dissection tool. Align notch on attachment with word “RELEASE” on the Black Max. Next turn attachment so notch is aligned with word “SECURE.”
3. The handpiece is now operational. Operating pressure is 120 psi (8.3 bar), as indicated on the AutoLube gauge, when using these attachments.

**Black Max QD Angle Attachments**

Refer to “Ordering Information” section for part numbers.

1. Lift Lever on Black Max. Align notch on angle attachment with word “RELEASE” on the side of the Black Max. Next, turn angle attachment so notch is aligned with word “SECURE” which is laser etched on the side of the Black Max.
2. Pull down retaining sleeve on angle attachment and rotate to left when attachment is pointed away from you.
3. Insert dissection tool.
4. Release retaining sleeve by rotating to right.
5. Pull dissection tool to ensure proper engagement.
6. Return Lever on Black Max handpiece to down position.

**Note:** Handpiece is now fully functional.

Operating pressure is 120 psi (8.3 bar), as indicated on the AutoLube gauge, when using these attachments.
**Straight Attachment Assembly**

**Craniotome Attachment Assembly**

**Dissection Tool Identification**

All dissection tools are packaged sterile, unless otherwise indicated, and are manufactured for single use. Each dissection tool has a series of identification numbers and letters imprinted on the label and on the shaft. The first letter describes the type of attachment, and the following characters indicate the size and style of the dissection tool.

For example:

**Dissection Tool Part Number:** S-2B-G1

**Dissection Tool Description:** 2 mm Fluted Ball, extended length

Each attachment is laser-marked with its corresponding part number.
**Straight Attachments**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORT</td>
<td>5 cm Short Attachment</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>8 cm Medium Attachment</td>
</tr>
<tr>
<td>LONG</td>
<td>11 cm Long Attachment</td>
</tr>
<tr>
<td>MIA16</td>
<td>16 cm Minimally Invasive Attachment</td>
</tr>
<tr>
<td>SHORT-HD</td>
<td>5 cm Heavy Duty Short Attachment</td>
</tr>
<tr>
<td>MEDIUM-HD</td>
<td>8 cm Heavy Duty Medium Attachment</td>
</tr>
<tr>
<td>LONG-HD</td>
<td>12.4 cm Heavy Duty Long Attachment</td>
</tr>
<tr>
<td>XL-HD</td>
<td>20.2 cm Heavy Duty Extra-Long Attachment</td>
</tr>
</tbody>
</table>

**XM Assembly for handpieces with ▲ and ▼.**

Distal end of handpiece or attachment is pointed away from user.

1. Move handpiece knurled knob to “RUN” (▲) position.
2. Slide attachment over distal end of handpiece. Pull attachment towards handpiece, and rotate attachment to right approximately one-quarter turn until fully seated. Handpiece knurled knob moves up to seat next to attachment.
3. Pull handpiece knurled knob towards “LOAD” (▼) position and insert dissection tool into distal end of attachment. Rotate dissection tool slowly until fully seated.
4. Release handpiece knurled knob into “RUN” (▲) position.

**Note:** Handpiece is now fully functional.

5. Pull dissection tool to ensure proper engagement.
6. Attachment and dissection tool are secure.

**Disassembly**

1. Move handpiece knurled knob to “SAFE” position.
2. Remove dissection tool from distal end of attachment.
3. Rotate attachment to left approximately one-quarter turn, and remove from distal end of handpiece.
Orange 45° or 90° Contra and Right Angle Attachments

ORANGE-45 45° Contra Angle Attachment
ORANGE-90 90° Right Angle Attachment

Caution: Set AutoLube operating pressure to 40 psi (2.8 bar).

XM

Assembly for handpieces with □ and □.

1. Ensure knurled knob on handpiece is in “RUN” (■) position.
2. Slide attachment over distal end of handpiece. Push attachment towards handpiece, and rotate attachment counterclockwise until fully seated. Handpiece knurled knob moves up to seat next to attachment.
3. Push latch on the distal end of the attachment up with your thumb.
4. Insert dissection tool into the side of the distal end (opposite side of latch) while rotating slowly until dissection tool seats.
5. Release latch and check security of attachment by pulling it away from handpiece and check dissection tool by pulling on dissection tool head. Latch will be flush with attachment when dissection tool is secure.

Note: Handpiece is now fully functional.

Disassembly

1. Lift latch on the distal end of the attachment with your thumb. Remove dissection tool and release latch.
2. Move handpiece knurled knob to “SAFE” position.
3. Rotate attachment clockwise and remove from distal end of handpiece.
### Craniotome and Specialty Attachments

<table>
<thead>
<tr>
<th>Attachment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRANI-P</td>
<td>6.5 cm Pediatric Craniotome</td>
</tr>
<tr>
<td>CRANI-A</td>
<td>6.5 cm Adult Craniotome</td>
</tr>
<tr>
<td>CRANI-L</td>
<td>7.5 cm Large Craniotome</td>
</tr>
<tr>
<td>CRANI-A-R</td>
<td>6.5 cm Rotating Adult Craniotome</td>
</tr>
<tr>
<td>ADG</td>
<td>7.2 cm Adjustable Drill Guide</td>
</tr>
<tr>
<td>CDA</td>
<td>6.8 cm Controlled Depth Attachment</td>
</tr>
</tbody>
</table>

**XM Assembly for handpieces with □ and ▲.**

Distal end of handpiece or attachment is pointed away from user.

1. Pull handpiece knurled knob towards “LOAD” (◼) position and insert dissection tool into distal end of handpiece. Rotate dissection tool slowly until dissection tool is fully seated.
2. Release handpiece knurled knob into “RUN” (▶) position.

**Note:** Handpiece is now fully functional.

3. Pull dissection tool to ensure proper engagement.
4. Slide attachment over distal end of handpiece. Pull attachment towards handpiece, and rotate attachment to right approximately one quarter turn until fully seated. Handpiece knurled knob moves up to seat next to attachment.
5. Attachment and dissection tool are secure.

**Disassembly**

1. Move handpiece knurled knob to “SAFE” position.
2. Rotate attachment to left approximately one quarter turn, and remove from distal end of handpiece.
3. Remove dissection tool from distal end of attachment.
**QD Angle Attachments**

QD8 8 cm Angle Attachment  
QD11 11 cm Angle Attachment  
QD14 14 cm Angle Attachment  

QD8-S 7.5 cm Angle Attachment  
QD11-S 10.5 cm Angle Attachment  
QD14-S 13.5 cm Angle Attachment

**XM Assembly for Handpieces with ▶ and ◀.**

Distal end of handpiece or attachment is pointed away from user.

1. Move handpiece knurled knob to “RUN” (▶) position.  
2. Slide attachment over distal end of handpiece. Pull attachment towards handpiece, and rotate attachment to right approximately one-quarter turn until fully seated. Handpiece knurled knob moves up to seat next to attachment.  
3. Pull retaining sleeve on angle attachment towards handpiece and rotate to left to the “RELEASE” position.  
4. Insert dissection tool into angle attachment. Rotate dissection tool slowly until it is fully seated. Release retaining sleeve on angle attachment by rotating retaining sleeve to right to the “SECURE” position.

**Note:** Handpiece is now fully functional.

5. Pull dissection tool to ensure proper engagement.  
6. Attachment and dissection tool are secure.

**Disassembly**

1. Pull retaining sleeve on angle attachment towards handpiece and rotate to left.  
2. Remove dissection tool from distal end of attachment.  
3. Move handpiece knurled knob to “SAFE” position.  
4. Rotate attachment to left approximately one-quarter turn, and remove from distal end of handpiece.
Device Description

The Otologic Curved Micro (OCM) Attachment connects to XMAX Pneumatic and EMAX® 2 and EMAX 2 Plus Electric Systems and accepts OCM Burr Support Sleeves, which are available in various cutting burr styles.

The OCM Burr Support Sleeve (OCM Burr) consists of the cutter and an outer sleeve that protects and supports the rotating shaft of the cutting burr.

Indications for Use

When used with the ANSPACH® Systems, the OCM Attachment and OCM Burr Support Sleeves are intended for cutting and shaping bone primarily in otology procedures such as cochleostomies.

Warning:

• Prior to first use the OCM Attachment must be processed as per the included Cleaning and Sterilization instructions.
• It is not intended for gross bone removal. Heavy loading and/or lack of irrigation while performing bone dissection may result in burr fracture.
• Prior to use, visually inspect the instrument(s). Do not use the instrument(s) if damaged.
• To avoid overheating this device, employ a duty cycle of 10 seconds ON and 10 seconds OFF for an unlimited number of cycles.

Note: When following these instructions hold handpiece and attachments with distal end pointing away from user.

OCM Installation for XMAX and EMAX Handpieces

1. Ensure handpiece is in “RUN” or “SECURE” position.
2. Insert OCM Attachment’s drive shaft into distal end of handpiece, push and rotate to right until it stops. Listen for a click as handpiece knurled knob moves up to seat next to OCM Attachment.
3. Gently twist back and forth to ensure OCM Attachment is locked into position.

OCM Burr Support Sleeve Assembly

1. Line up arrow located on the distal end of OCM Attachment with flat end of OCM Burr, push until fully seated. Listen for a click (Illustration 1).
2. Gently pull OCM Burr to ensure it is locked into position.

Curved Burr Support Sleeve Disassembly

1. Remove OCM Burr from distal end of OCM Attachment by grasping OCM Burr at grooves (Illustration 1).
2. Treat the OCM Burr Support Sleeve as biohazardous waste and dispose of accordingly.

OCM Disassembly for XMAX and EMAX Handpieces

1. Move handpiece knurled knob to “SAFE” position.
2. Rotate OCM Attachment to left approximately one quarter turn, and remove from distal end of handpiece housing.
MINIMAL ACCESS ATTACHMENTS AND DISSECTION TOOL ASSEMBLY

Note: Instructions are the same for straight or angled drivers and for straight or curved bearing sleeves in 10 cm, 15 cm, and 19 cm lengths. The four words labeled on the drivers mean the following:

- **CUTTER**: Insert or remove dissection tool
- **RUN**: Attachment and dissection tool are now functional
- **ADJUST**: Bearing Sleeve can be moved 3 mm forward or back
- **TUBE**: Insert or remove bearing sleeve

Warning: The Minimal Access Attachments are to be used only for delicate bone dissection applications. Excessive force or side loads during use can cause rapid temperature increase at the distal end of the attachment. Always use copious irrigation with this attachment.

MA-D20BM  20° Angle Driver (for Black Max)
MA-D20    20° Angle Driver (for XMAX System)
MA-DRIVER  Straight Driver (for XMAX System)

**BM**

Black Max 20° Angle Driver Installation

1. Ensure locking lever is up.
2. Align notch on BM 20° angle driver with “RELEASE” arrow on handpiece while inserting driveshaft of BM 20° angle driver into handpiece. Rotate BM 20° angle driver to right until notch is aligned with “SECURE” arrow on handpiece. Push locking lever down to locked position.
3. Gently twist back and forth to ensure driver is locked into position.

**XM**

XMAX System Driver Installation

1. Ensure handpiece is in “RUN” ( ) position
2. Insert driveshaft of driver into distal end of handpiece, push and rotate to right until it stops. Listen for a click as handpiece knurled knob moves up to seat next to driver.
3. Gently twist back and forth to ensure driver is locked into position.
Minimal Access Attachments and Dissection Tool Assembly

**Bearing Sleeve and Dissection Tool Assembly**  
(BM 20° Angle Driver, 20° Angle Driver, or Straight Driver)

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA-10S</td>
<td>Bearing Sleeve, 10 cm Straight</td>
</tr>
<tr>
<td>MA-10C</td>
<td>Bearing Sleeve, 10 cm Curved</td>
</tr>
<tr>
<td>MA-15S</td>
<td>Bearing Sleeve, 15 cm Straight</td>
</tr>
<tr>
<td>MA-15C</td>
<td>Bearing Sleeve, 15 cm Curved</td>
</tr>
<tr>
<td>MA-15ST</td>
<td>Bearing Sleeve, 15 cm Straight Taper</td>
</tr>
<tr>
<td>MA-19ST</td>
<td>Bearing Sleeve, 19 cm Straight Taper</td>
</tr>
</tbody>
</table>

1. Rotate knurled knob on driver to line up arrow with “TUBE.”
2. Fully insert desired bearing sleeve into distal end of driver by lining up black line on bearing sleeve with black line on driver.
3. Rotate knurled knob to line up arrow with “CUTTER.”
   Check security of bearing sleeve by pulling distally.
4. Insert dissection tool into distal tip of bearing sleeve.
   Rotate dissection tool slowly until it is fully seated. Rotate knurled knob on driver to line arrow with “RUN.”

**Note:** Additional force is required to seat dissection tool into curved bearing sleeve.

5. Check security of dissection tool by pulling distally on dissection tool head.
6. Bearing sleeve and dissection tool are secure.

**Dissection Tool Disassembly**

1. Rotate knurled knob on driver to line up arrow with “CUTTER.” Remove dissection tool from distal end of attachment.

**Bearing Sleeve Adjustment**

1. Rotate knurled knob on driver to line up arrow with “ADJUST.”
2. Pull bearing sleeve either 3 mm distally or proximally to desired exposure.
3. Rotate knurled knob on driver to line up arrow with “RUN.”

**Bearing Sleeve Disassembly**

1. Rotate knurled knob on driver to line up arrow with “TUBE.” Remove bearing sleeve distal end of driver.

**BM Driver Removal for Black Max**

1. Driver removal is reversal of installation instructions.

**XM Driver Removal for XMAX System**

1. Move handpiece knurled knob to “SAFE” position.
2. Rotate attachment to left approximately one-quarter turn, and remove from distal end of handpiece.
The microSaws were designed for small bone dissection. The microSaw Drivers provide direct connection to Black Max and XMAX System. The Drivers also enable rapid exchange of saw head styles through a unique quick-disconnect system.

**Keyless Driver Installation**

**BM**

Black Max Keyless Driver Installation

BM-DRIVER Keyless Driver

1. Ensure locking lever is up.
2. Align notch on keyless driver with "RELEASE" arrow on handpiece while inserting drive shaft of Keyless Driver into handpiece. Rotate keyless driver clockwise until notch is aligned with "SECURE" arrow on handpiece. Push locking lever down to locked position.

**Disassembly**

1. Raise locking lever.
2. Rotate BM-DRIVER counterclockwise and remove from handpiece.

**XM**

XMAX System Keyless Driver Installation

DRIVER Keyless Driver

1. Ensure knurled knob on handpiece is in "RUN" or "SECURE" position.
2. Insert drive shaft of keyless driver into handpiece and rotate clockwise until locked. Gently twist back and forth to ensure it is locked into position.

**Disassembly**

1. Pull knurled knob down and twist counterclockwise until it seats into position.
2. Rotate DRIVER counterclockwise and remove.

**BM-DRIVER and DRIVER Duty Cycle**

30 Sec ON, 30 Sec OFF for 8 cycles.

The recommendations for times of use for the DRIVER attachments have been determined under average load and worst-case ambient air temperature of 85°F (29°C).
Oscillating, Sagittal, and Reciprocating Saw Attachment Assembly

S-SAW  Sagittal microSaw Attachment
R-SAW  Reciprocating microSaw Attachment
O-SAW  Oscillating microSaw Attachment

1. Insert saw attachment drive shaft into distal end of keyless driver. Rotate until three tabs on attachment engage three slots in keyless driver.
2. Continue to rotate counterclockwise while pushing attachment into keyless driver until attachment locks into position and release ring snaps into position. When fully engaged, contours on keyless driver body, release ring, and saw attachment will be in alignment.

Sagittal Saw Blade Assembly

1. Press down on release button to open saw blade mounting plate.
2. Insert saw blade into opening through slot on mounting plate and align saw blade hub with locking pins in mounting plate.
3. Release button and ensure mounting plate is firmly seated on saw blade without gaps.

Reciprocating Saw Blade Installation

1. Rotate chuck counterclockwise until chuck has opened sufficiently to accept a saw blade.
2. If blade has a shank with a shaft, insert shaft of blade in chuck jaws until it is fully inserted and tighten chuck knob clockwise until snug.
3. If blade has a flat shank, insert blade into slots in chuck until it is fully inserted and tighten chuck knob clockwise until snug.

Oscillating Saw Blade Assembly

1. Press down on release button to open saw blade mounting plates.
2. Insert saw blade into opening and align saw blade hub with locking pins in mounting plates. Oscillating saw blades can be aligned in 45° increments.
3. Release button and ensure mounting plates are firmly seated on saw blade without gaps.

Saw Blade Removal

1. Saw blade removal is reverse of installation.

Disassembly

Saw and Small Attachment Removal

1. With one hand supporting attachment, rotate release ring on keyless driver with other hand counterclockwise until attachment is released.
J-Latch and Keyless Jacobs Chuck Attachment Assembly

SA-JACOBS  Jacobs Chuck
SA-JLATCH  J-latch Chuck

Note: Anspach does not supply dissection tools for SA-JLATCH or SA-JACOBS small attachments.

Keyless driver refers to either BM-DRIVER or DRIVER.
1. Insert attachment drive shaft into distal end of keyless driver. Rotate until three tabs on attachment engage 3 slots in keyless driver.
2. Continue to rotate counterclockwise while pushing attachment into keyless driver until attachment locks into position and release ring snaps into position.
3. When fully engaged, contours on keyless driver body, release ring, and small attachment will be in alignment.

J-Latch Dissection Tool Assembly

1. Pull back distal sleeve in direction of arrow on SA-JLATCH attachment and hold it down to insert dissection tool into distal end of attachment.
2. Rotate dissection tool slowly until fully seated.
3. Release distal sleeve and check security of dissection tool by pulling distally on dissection tool.
4. Dissection tool and attachment are secure.

J-Latch Dissection Tool Removal

1. Pull back distal sleeve in the direction of arrow on SA-JLATCH and hold it down while pulling dissection tool out distally for removal.
2. Release the distal sleeve.

Keyless Jacobs Chuck Dissection Tool Assembly

1. Press down on center of release button located on SA-JACOBS attachment while rotating knurled knob on attachment clockwise until fully opened.
2. Insert dissection tool into distal end of attachment until it touches bottom.
3. Rotate knurled knob counterclockwise while centering cutter on attachment until tight; release button.
4. Check security of dissection tool by pulling distally on dissection tool.
5. Dissection tool and attachment are secure.

Caution: Do not press down on release button while attachment is in use.

Keyless Jacobs Chuck Dissection Tool Removal

1. Press down on center of release button located on SA-JACOBS attachment while rotating knurled knob on attachment clockwise until fully opened.
2. Pull dissection tool out distally for removal.
3. Release button.

Disassembly

microSaw and Small Attachment Removal

1. With one hand supporting attachment, rotate release ring on keyless driver with other hand counterclockwise until attachment is released.
Sagittal Saws

B-SAGITTAL   Black Max Sagittal Saw
MM-SAGITTAL  Sagittal Saw (for XMAX System)

The B-SAGITTAL and MM-SAGITTAL operate at 120 psi, providing 20,000 cycles per minute while it oscillates through a blade arc of four degrees.

BM
Black Max Sagittal Saw Assembly for handpieces with “SECURE” and “RELEASE”

1. The words “SECURE” and “RELEASE” engraved on side of handpiece refer to locking and unlocking attachment on handpiece, respectively. Lift lever on handpiece.
2. Align notch on Sagittal Saw with “RELEASE” on handpiece.
3. Turn Sagittal Saw so notch is aligned with “SECURE” on handpiece.
4. Press down lever on handpiece.
5. For B-SAGITTAL, see Blade Assembly.

XM
Sagittal Saw Assembly and Disassembly for handpieces with \( \text{•} \) and \( \text{•} \).

(Distal end of handpiece or attachment is pointed away from user.)
1. Remove red storage cover. Move handpiece knurled knob to “RUN” \( \text{•} \) position.
2. Slide Sagittal Saw over distal end of handpiece. Pull Sagittal Saw towards handpiece, and rotate to right approximately one-quarter turn until fully seated. Handpiece knurled knob will move up to seat next to Sagittal Saw.
3. Sagittal Saw is secure.
4. See Blade Assembly.

Disassembly

1. Move handpiece knurled knob to “SAFE” position.
2. Rotate Sagittal Saw to left approximately one-quarter turn, and remove from distal end of handpiece.

Blade Assembly (B-SAGITTAL/MM-SAGITTAL)

1. Raise and fully extend extension handle on saw blade attachment mechanism.
2. Rotate extension handle counter-clockwise to open saw blade mounting plates.
3. Insert saw blade into opening and align saw hub with locking pins in mounting plates. Blades can be aligned in 45° increments.
4. Rotate extension handle clockwise to secure saw blade and lower extension handle into closed position.
**Handheld Attachments Assembly**

**Perforator Driver**

CSR60BM  Perforator Driver with Hudson End  
(for Black Max)  
CSR60  Perforator Driver with Hudson End  
(for XMAX System)

This Perforator Driver attachment allows Hudson style cranial perforators to be used with Black Max and XMAX Systems (60:1 Ratio, approximately 1,300 rpm.)

Refer to the Cranial Perforator manufacturer’s operating instructions for rotational speed requirements.

**Note:** Instructions are written such that distal end of handpiece and attachment are pointed away from user.

**BM**

**Black Max Perforator Driver Assembly for handpieces with “SECURE” and “RELEASE”**

1. Remove red storage cover.  
2. Lift lever on handpiece.  
3. Slide Perforator Driver over distal end of handpiece until fully seated. Rotate Perforator Driver to right approximately one-quarter turn.  
4. Press down lever on handpiece.  
5. Pull back retaining sleeve; insert Hudson-end of cranial perforator and release retaining sleeve.

**Disassembly**

1. Lift lever on handpiece.  
2. Rotate Perforator Driver to left approximately one-quarter turn and remove device.  
3. Replace red storage cover.

**XM**

**Perforator Driver Assembly for handpieces with ▲ and ▼.**

1. Remove red storage cover.  
2. Move handpiece knurled knob to “RUN” ▲ position.  
3. Slide Perforator Driver over distal end of handpiece. Pull Speed Reducer towards handpiece and rotate to right approximately one-quarter turn until fully seated. Handpiece knurled knob will move up to seat next to Perforator Driver.  

**Disassembly**

1. Pull Perforator Driver retaining sleeve towards handpiece and remove cranial perforator from distal end of Perforator Driver.  
2. Move handpiece knurled knob to “SAFE” ▼ position.  
3. Rotate Perforator Driver to left approximately one-quarter turn and remove from distal end of handpiece.  
4. Replace red storage cover.

**Note:** The red storage cap provided with the Perforator Driver is to prevent damage to the shaft.

The cap is removed for cleaning, washing, and sterilization. The cap is used for storage purposes only.
The following manual cleaning and mechanical/automated cleaning with manual Precleaning instructions have been validated by Anspach for preparing a nonsterile medical device; this instruction is provided in accordance with ISO 17664:2004 and ANSI/AAMI ST81:2010.

**Warning:** Transmissible spongiform encephalopathies (TSE). *DePuy Synthes Power Tools* will not authorize or accept the return of products that directly contact patients or are contaminated with body fluids of a patient who is suspected or confirmed with a TSE/Creutzfeldt-Jakob disease (TSE/CJD) diagnosis. *DePuy Synthes Power Tools* recommends that all Anspach products used on a patient confirmed with a TSE/CJD diagnosis be incinerated. Anspach dissecting tools used on a patient suspected of TSE/CJD diagnosis must be incinerated.

Contact your Sales Representative for replacement of product incinerated under this policy or for temporary equipment while the original equipment is quarantined. Contact the *DePuy Synthes Power Tools* Customer Service department regarding TSE/CJD contamination for additional information.
MANUAL CLEANING

HIGH-SPEED HANDPIECES

Detergents
- Neutral pH enzymatic detergents are recommended for the manual washing of the high speed handpieces.
- Alkaline detergents with a maximum pH of 11 may be used, but user must demonstrate their effectiveness.
- The process, detergent, and any additives must be discussed with detergent manufacturer.

Warning: Wear eye protection and any additional personal protective equipment required.

Caution: Do not immerse! Do not insert brush into handpiece housing. Do not use saline solution for cleaning. Do not use cleaners containing chlorinated phenols of any concentration. Using cleaners/disinfecting agents containing chlorinated phenols will result in premature hose failure. Do not use hypochlorite (ie, bleach) solutions, since these will corrode metal components. Do not use alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals, which can increase wear and cause device malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device.

1 Preparation
Gather all necessary supplies such as a lint-free cloth.

Remove the attachment and dissection tool from the handpiece (Figure 1).

2 Clean
Wipe with a clean, deionized, distilled, or purified water-dampened cloth and mild detergent (neutral pH).

Caution: DO NOT IMMERESE. Handpiece must not be exposed to ingress of water or to severe physical trauma; degradation of unit function and/or performance may occur.

3 Inspect
Visually inspect the handpiece and repeat step 2 until no visible soil remains.
ATTACHMENTS

Caution: Manual cleaning instructions for all attachments except the Minimal Access (MA) attachments and bearing sleeves.

Detergents
• Alkaline detergents with a maximum pH of 11 are recommended for the manual washing of the attachments.
• The process, detergent, and any additives must be discussed with detergent manufacturer.

Warning: Wear eye protection and any additional personal protective equipment required.

Caution: Do not use alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device. Do not use ultrasonic equipment or corrosive or harsh chemical soaps. Do not rinse attachment with saline solution.

Note: “DO NOT IMMERSE” as marked on attachments is for OR personnel only.

1 Preparation

Gather all necessary supplies including Attachment Cleaning Brush (ACB), sponge, lint-free cloth, and soft bristle brush. Remove the attachment and dissection tool from the handpiece (Figure 1).

CSR60 and CSR60-BM only: The red storage cap provided with the Perforator Driver is to prevent damage to the shaft. The cap is removed for cleaning, washing, and sterilization (Figure 2). The cap is used for storage purposes only.

2 Immerse

Fully immerse the attachment in an alkaline cleaner with a maximum pH of 11 (nonchlorinated detergent), prepared as described on the product label, at room temperature, in a suitable container and agitate for 15 seconds (Figure 3).
Clean Cannulations

Caution: This step refers ONLY to the following attachments (for other attachments proceed to step 4):

<table>
<thead>
<tr>
<th>Type of Attachment</th>
<th>Names of Attachments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialty Attachments</td>
<td>ADG, B-GREY-ADG, B-TURQ-CDA, CDA</td>
</tr>
<tr>
<td>QD Attachments</td>
<td>QD8, QD8-S, QD11, QD11-S, QD14, QD14-S, B-QD8, B-QD8-S, B-QD11, B-QD11-S, B-QD14, B-QD14-S</td>
</tr>
</tbody>
</table>

Gently insert and remove Anspach Attachment Cleaning Brush (ACB) wetted with alkaline cleaner through either openings (distal or proximal) of the attachment as many times as necessary to remove any foreign debris (Figure 4).

Caution: Do not insert anything into the attachment except the ACB as specified. Do not force the brush into or through the attachment. ACB is to be utilized once per system set and discarded once the system cleaning is complete.

Rinse

Rinse the attachment in a suitable container filled with deionized, distilled, or purified water and agitate for 15 seconds.

Inspect

Repeat Steps 2-4 until there is no evidence of soils or residuals on the attachment surface or ACB.

Cleaning Instructions for Minimal Access (MA) Attachments

Minimal Access Drivers (MA-D20, MA-20BM, MA-DRIVER)

Note: Please refer to cleaning instructions provided with the MA attachments.
FOOT CONTROLS

AutoLube Foot Control

Caution: Do not immerse or sterilize. Do not allow liquid to enter AutoLube, except as specified in the operating manual for adding Anspach oil.

1
Clean
Clean AutoLube foot control by wiping with nonabrasive cloth and disinfectant or mild detergent and water after each case.

2
Add oil
Check oil level and add Anspach oil and filter when level is below “MIN OIL” level line.

3
Store
Store in upright position.

iMRI Foot Control

Caution: Do not immerse or sterilize!

1
Clean
Clean iMRI Foot Control by wiping with non-abrasive cloth and disinfectant or mild detergent and deionized, distilled, or purified water after each case.

2
Dry
Dry thoroughly with non-abrasive cloth.
HIGH-SPEED HANDPIECES

Detergents
- A neutral pH enzymatic detergent is recommended.
- Alkaline detergents with a maximum pH of 11 may be used, but user must demonstrate their effectiveness.
- The process, detergent, and any additives must be discussed with detergent manufacturer.

Caution:
- Do not use any alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device to malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device.
- XMAX-H System may not be cleaned automatically.

1 Preparation
Gather all necessary supplies including Attachment Cleaning Brush (ACB), sponge, lint-free cloth, and soft bristle brush. Remove the attachment and dissection tool from the handpiece (Figure 1).

2 Rinse
Rinse the handpiece with distal end pointing down under running cold, deionized, distilled, or purified water for a minimum of two minutes. Use a sponge, soft lint-free cloth, or soft bristle brush to assist in removing gross soils (Figures 2 and 3).

Caution: Do not use high pressure water or air. Do not allow running water to enter distal end of handpiece. Do not place the hose end under running water.
3
Manipulate Moving Parts
Manipulate the handpiece knurled knob under running cold deionized, distilled, or purified water to loosen or remove gross soil (Figure 4).

4
Clean
Prepare a cleaning solution using neutral pH enzymatic detergent per the manufacturer’s directions for correct temperature, water quality (ie, pH, hardness), and product concentration/dilution.

Spray and wipe the handpiece with the cleaning solution for a minimum of two minutes. Rinse the handpiece thoroughly under running cold deionized, distilled, or purified water for a minimum of two minutes while manipulating the knurled knob (Figures 5 and 6).

Use a sponge, soft lint-free cloth, or soft bristle brush to remove all visible soil.

Place locking mechanism in the “SAFE” position prior to performing the following step (Figure 7).

Hold the handpiece at a downward angle and insert the Anspach Cleaning Brush (ACB) wetted with cleaning solution into the distal end of the handpiece (Figure 8).

Warning: ACB is single use and should only be used to clean one handpiece and associated attachments.

Caution: Do not immerse. Do not allow running water to enter distal end of handpiece. Do not insert ACB beyond last bristle. Do not force ACB into handpiece. Do not place the hose end under running water. Do not use pipe cleaners.
5

Rinse Thoroughly

Rinse the handpiece thoroughly under running hot deionized, distilled, or purified water for a minimum of 2 minutes (Figure 9).

Place locking mechanism in “SAFE” position prior to performing the following step (Figure 10).

Hold the handpiece at a downward angle and flush inside of the distal end using a syringe or pipette filled with hot deionized, distilled, or purified water (Figure 11). Place the knurled knob in the “RUN” position (Figure 10).

**Caution:** Do not use high pressure water or air. Do not immerse. Do not allow running water to enter distal end of handpiece. Do not place the hose end under running water.

6

Inspect

Visually inspect the handpiece and repeat Steps 2 through 6 until no visible soil remains.

**Warning:** Manual Precleaning must be followed by mechanical/automated cleaning.
ATTACHMENTS

**Detergents**
- A neutral pH enzymatic detergent is recommended.
- Alkaline detergents with a maximum pH of 11 may be used, but user must demonstrate their effectiveness.
- The process, detergent, and any additives must be discussed with detergent manufacturer.

**Caution:** Do not use any alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals which can increase wear and cause device to malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device.

**Warning:** Do not clean the MA-19ST Minimal Access Bearing Sleeve or attachments not mentioned on page 49 in the EM/XM Cleaning and Sterilization Basket.

1 **Preparation**

Gather all necessary supplies including Attachment Cleaning Brush (ACB), Small Diameter Cleaning Brush (SDCB), sponge, lint-free cloth, and soft bristle brush. Remove the attachment and dissection tool from the handpiece (Figure 1).

**Note:** Red storage cap is provided with Perforator Driver to prevent damage to shaft. Cap is removed for cleaning, washing, and sterilization (Figure 2). Cap should be used for nonsterile storage purposes only.

2 **Rinse**

Rinse the attachment under running cold deionized, distilled or purified water for a minimum of two minutes. Use a sponge, soft lint-free cloth, or soft bristle brush to assist in removing gross soil (Figures 3 and 4).

**Caution:** Do not use high pressure water or air. Do not rinse attachment with saline solution.
3 Manipulate Moving Parts

Manipulate all moving parts such as release sleeves under running cold deionized, distilled, or purified water to loosen or remove gross soil (Figure 5).

4 Clean

Prepare a cleaning solution using neutral pH enzymatic detergent per the manufacturer’s directions for correct temperature, water quality (ie, pH, hardness), and product concentration/dilution.

Fully immerse the attachment in cleaning solution in a suitable container and manually agitate for two minutes (Figure 6). Use a sponge, soft lint-free cloth, or soft bristle brush to remove all visible soil.

Gently use ACB or SDCB wetted in cleaning solution to clean cannulations of attachment. The brushes may be inserted from the distal or proximal end of the attachment (Figure 7).

Warning: ACB and SDCB are single use and should only be used to clean one set of attachments.

Caution: Do not force ACB or SDCB into or through attachment. Do not use ACB or SDCB to clean the MA-D20, MA-D20BM and MA-DRIVER. For Minimal Access Attachment Bearing Sleeves, use SDCB only. Do not use pipe cleaners.

Note: “DO NOT IMMERSE” as marked on the attachment is for Operating Room personnel only. The SDCB may be inserted from the distal or proximal end of the bearing sleeve.
5 Rinse thoroughly

Rinse the attachment thoroughly under running hot deionized, distilled, or purified water for a minimum of two minutes (Figure 8). Use a syringe or pipette filled with hot deionized, distilled, or purified water to flush lumens or channels (Figure 9).

Caution: Do not use high pressure water or air. Do not rinse attachment with saline solution.

6 Inspect

Visually inspect the attachment and repeat Steps 2 through 6 until no visible soil remains.

Warning: Manual Precleaning must be followed by mechanical/automated cleaning.
High-Speed Handpieces and Attachments

Detergents

• A neutral pH enzymatic detergent is recommended.
• Alkaline detergents with a maximum pH of 11 may be used, but user must demonstrate their effectiveness.
• The process, detergent, and any additives must be discussed with detergent manufacturer.

Caution: Do not use any alkaline detergent with a pH greater than 11. Alkaline detergents attack grease and seals, which can increase wear and cause device to malfunction. Please note use of alkaline detergents can cause color to fade but this does not impair function of device. Bearings and seals of all devices are exposed to greater stress during mechanical/automated cleaning than manual cleaning. If devices are mechanically cleaned they must be sent to a DePuy Synthes Power Tools Service Center at least once a year for maintenance.

Warning: Do not clean the MA-19ST Minimal Access Bearing Sleeve in the EM/XM Cleaning and Sterilization Basket.

Mechanical/Automated Cleaning Guidelines

DePuy Synthes Power Tools can only be mechanically cleaned under the following conditions:

• Cannulations must be precleaned with appropriate brushes as described in Precleaning instructions.
• Devices must not be cleaned using ultrasonic equipment.
• Handpieces must not be immersed in cleaning solution but may be sprayed with it.
• Fully deionized or purified water must be used during final rinse to prevent corrosion and spots.
• Devices must be cleaned immediately after use to ensure blood and tissue never dry on them.
• National regulations must be observed.
• You must follow standard hospital procedures.
• You must follow manufacturer’s recommendations for any detergents, disinfectants, and washing equipment used.
1

Loading the Basket

Load the devices in the basket by securing them in the appropriate brackets as marked on the basket (Figure 1). Reference loading configuration pictures on page 50 for proper placement and positioning of devices. Where applicable, distal end of devices should be angled downward.

**Warning:** Red protective cap for Perforator Driver must be left off during mechanical/automated cleaning (Figure 2).

**Caution:** Connector ends of electric and pneumatic handpieces must be sealed with special seal caps provided (Figure 3).

**Note:** Before putting on seal cap, turn black cap to wrap cable tight around it (Figure 4).

2

Mechanical/Automated Cleaning Cycle Process Parameters

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Duration (minimum)</th>
<th>Cleaning Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rinse</td>
<td>2 minutes</td>
<td>Cold deionized or purified water</td>
</tr>
<tr>
<td>Pre-wash</td>
<td>1 minute</td>
<td>Warm deionized or purified water (≥ 40°C); use detergent</td>
</tr>
<tr>
<td>Cleaning</td>
<td>2 minutes</td>
<td>Warm deionized or purified water (≥ 45°C); use detergent</td>
</tr>
<tr>
<td>Rinse</td>
<td>5 minutes</td>
<td>Rinse with deionized or purified water</td>
</tr>
<tr>
<td>Thermal Processing</td>
<td>5 minutes</td>
<td>Hot deionized water, ≥ 93°C</td>
</tr>
<tr>
<td>Dry</td>
<td>40 minutes</td>
<td>≥ 90°C</td>
</tr>
</tbody>
</table>

**Caution:** Do not use neutralizing agent.

3

Inspect

Visually inspect the devices and repeat the manual pre-clean and mechanical/automated clean if visible soil remains. Remove seal cap from connector end of handpiece and drain until no visible droplets are coming from the handpiece or connector.
Perform these activities regularly as per institution policy.

**Warning:** Do not use any damaged equipment. Return to *DePuy Synthes Power Tools* repair facility.

### Attachments

#### Straight Attachments

- **B-SILVER**
- **B-TURQUOISE**
- **B-VIOLET**
- **B-BLUE-S**
- **B-MRA-S**
- **B-MRA-M**
- **B-MRA-L**
- **B-TURQ-L**
- **B-BLACK**
- **B-RED**
- **LONG**
- **LONG-S**
- **LONG-01**
- **LONG-HD**
- **MEDIUM**
- **MEDIUM-HD**
- **MIA16**
- **SHORT**
- **SHORT-HD**
- **XL-HD**

#### Angle Attachments

- **B-QD8**
- **B-QD8-S**
- **B-QD11**
- **B-QD11-S**
- **B-QD14**
- **B-QD14-S**
- **MA-D20**
- **MA-D20BM**
- **MA-DRIVER**
- **QD8**
- **QD8-S**
- **QD11**
- **QD11-S**
- **QD14**
- **QD14-S**

#### Craniotomes

- **B-TURQ-X**
- **B-GOLD**
- **B-GREEN**
- **B-GREEN-R**
- **CRANI-A**
- **CRANI-A-R**
- **CRANI-L**
- **CRANI-L-R**
- **CRANI-P**

Visually inspect for any damage to the tube.

Visually inspect for bent or broken drive shaft and for any damage to the tube.

Visually inspect for bent or broken foot.
Other Attachments

- ADG
- B-GREY-ADG
- B-TURQ-CDA
- B-ORANGE-90
- B-ORANGE-45
- BM-DRIVER
- CSR60BM
- CDA
- CSR60
- DRIVER
- MDA
- OCM
- ORANGE-45
- ORANGE-90
- O-SAW
- R-SAW
- S-SAW
- SA-JACOBS
- SA-JLATCH

Foot Controls

- All AutoLube Models

Visually inspect for overall damage or missing components.

Visually inspect for damage to the hose.

Visually inspect for damage to the housing or pedal.
**Handpiece**

- XMAX
- XMAX-H
- BLACKMAX-N
- BLACKMAX-N-LP

Ensure that the knurl knob operates properly.

Visually inspect for damage to the silicone hose.

Connect to foot control and operate. The handpiece should operate smoothly.
  - There is no requirement to operate with attachment or dissection tool.
LUBRICATION

HANDPIECES

Do not lubricate handpieces.

ATTACHMENTS

Caution: This step is for attachments only. Do not lubricate handpieces.

Option 1: 05.001.078, Lubricant for Anspach Systems, 110 mL
- Follow all instructions provided in the accompanying documentation delivered with the article
- For the following attachments apply one (1) pump spray to the proximal end of the attachment

<table>
<thead>
<tr>
<th>SHORT-G1</th>
<th>MEDIUM-HD-G1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORT-HD-G1</td>
<td>MEDIUM-G1</td>
</tr>
<tr>
<td>LONG-HD-G1</td>
<td>CRANI-A-G1</td>
</tr>
<tr>
<td>LONG-G1</td>
<td>CRANI-L-G1</td>
</tr>
<tr>
<td>MIA16-G1</td>
<td>CRANI-P-G1</td>
</tr>
</tbody>
</table>

- For the following attachments apply one (1) pump spray to the distal end of the attachment and one (1) to the proximal end of the attachment.

| MA-D20-G1 | QD8-G1 |
| QD11-G1 | CSR60-G1 |

- Applying excess amounts of lubricant will cause the lubricant to drip from the attachment. Clean off any excess lubricant.

Option 2: Non-Silicone Based Medical Lubricant
- Prepare a lubricating solution of instrument milk (nonsilicone based medical lubricant) per the manufacturer’s directions.
- Fully immerse attachment in lubricating solution, at room temperature, in a suitable container and agitate for 15 seconds.
- Remove attachment and allow it to drain completely until no visible droplets are coming from it.
  Return attachments to basket for further processing.

Caution: Do not rinse out instrument milk. Do not apply mineral oil or other lubricants, which may cause attachment to overheat.
The following sterilization instruction has been validated by Anspach in accordance with ISO 17665.

**Before sterilizing:** Ensure sterilization equipment is in proper working order as specified by manufacturer. Ensure equipment manufacturer’s instructions are properly employed by trained and qualified personnel. Ensure actual cycle employed has been properly validated for the device(s)/load configuration being processed and appropriate sterilization indicator devices are included for each process and cycle.

**Caution**

- Red protective cap for CSR60 and CSR60-BM must be removed prior to sterilization (Figure 1). In the case mechanical/automated cleaning was done in the EX-BSKT, seals cap from connector end of pneumatic handpiece must be removed prior to sterilization (Figure 2).
- Devices must be cleaned prior to sterilization using the validated cleaning method outlined in these instructions.

**Preparation**

Following cleaning and lubrication, load the basket and sterilize in accordance with the following guidelines.

Load attachments and handpiece in EM/XM Cleaning and Sterilization Basket by securing them in appropriate brackets as marked on basket with distal end angled down.

Replace seal cap in its bracket and lay handpiece connector in bottom of basket.

Secure the lid on the basket.
Sterilization
High-Speed Handpieces and Attachments

Package for Sterilization

When wrapping the basket the lid must be used.

Double wrap basket or instruments in accordance with local procedures, using standard wrap or wrapping techniques such as those described in ANSI/AAMI ST79.

If using the EMAX2-TRAY or XM-CASE or BM-CASE-TRAY:

<table>
<thead>
<tr>
<th>Method/Cycle</th>
<th>Exposure Temperature</th>
<th>Exposure Time</th>
<th>Minimum Dry Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam Autoclave/Pre-vacuum (wrapped or unwrapped)</td>
<td>Option 1: 132°C</td>
<td>4 minutes</td>
<td>30 minutes</td>
</tr>
<tr>
<td></td>
<td>Option 2: 134°C–138°C</td>
<td>3–18 minutes</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Steam Autoclave/Gravity Air Displacement (wrapped or unwrapped)</td>
<td>Option 1: 132°C</td>
<td>15 minutes</td>
<td>30 minutes</td>
</tr>
<tr>
<td></td>
<td>Option 2: 132°C–138°C</td>
<td>15–18 minutes</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>

Warning: STERRAD—refer to the accompanying documentation of the individual products to determine compatibility.

If using the EX-BSKT Washing and Sterilization Basket:

<table>
<thead>
<tr>
<th>Method/Cycle</th>
<th>Exposure Temperature</th>
<th>Exposure Time</th>
<th>Minimum Dry Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam Autoclave/Pre-vacuum (wrapped or unwrapped)</td>
<td>Option 1: 132°C</td>
<td>4 minutes</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>Option 2: 134°C–138°C</td>
<td>3–18 minutes</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Steam Autoclave/Gravity Air Displacement (wrapped or unwrapped)</td>
<td>Option 1: 132°C</td>
<td>15 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td>Option 2: 132°C–138°C</td>
<td>15–18 minutes</td>
<td>15 minutes</td>
</tr>
</tbody>
</table>

Notes

• Foot Controls should not be sterilized.
• It is required to include the drying cycle to avoid possible adverse effects caused by exposure to residual moisture.
• Metal devices, tools, and equipment are constructed of materials unaffected by normal environmental conditions of current standard sterilization means, when proper operational techniques are employed.
• Effectiveness of sterilization equipment or sterilization processes are directly dependent upon numerous factors beyond DePuy Synthes Power Tools’ control, including among other things; sterilization means, processes and wrapping techniques employed, brand, model and condition of sterilization equipment, care and maintenance techniques employed, and operator knowledge and experience.

• DePuy Synthes Power Tools cannot anticipate all possible equipment, processes, and/or conditions that may be encountered. The suggested operation conditions are to be considered as a starting point for determination of the overall process capability, without regard for type or condition of equipment used or methods, techniques, or practices employed by user. Use of proper sterilization indicator devices is strongly recommended.
LOADING CONFIGURATION

HIGH-SPEED HANDPIECES AND ATTACHMENTS

Seal Cap (when not in use)

CSR60

Seal cap installed on connector end of handpiece.

EMAX2PLUS or XMAX

SHORT  MEDIUM  LONG  MIA16  LONG-HD  MEDIUM-HD  SHORT-HD

MA Bearing Sleeves (excluding MA19-ST)  MA-D20  QD8  QD11  CRANI-P  CRANI-A  CRANI-L
# Troubleshooting

## Pneumatic Handpieces (Black Max and Xmax)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of power or excessive handpiece noise</td>
<td>• Inadequate lubrication</td>
<td>• Add OIL-II to AutoLube.</td>
</tr>
<tr>
<td></td>
<td>• Inadequate operating pressure</td>
<td>• Check pressure on AutoLube. Extra long extension hose from air source could reduce operating pressure.</td>
</tr>
<tr>
<td></td>
<td>• Muffler not connected properly</td>
<td>• Check Schrader connection.</td>
</tr>
<tr>
<td></td>
<td>• Handpiece hose damaged</td>
<td>• Check for handpiece hose occlusion.</td>
</tr>
<tr>
<td></td>
<td>• Faulty internal component</td>
<td>• Return to DePuy Synthes Power Tools for service.</td>
</tr>
<tr>
<td></td>
<td>• Pressure Relief Valve activated</td>
<td>• Check connection between muffler and AutoLube. Muffler must be inserted past red line.</td>
</tr>
<tr>
<td>Handpiece does not rotate when foot pedal is activated</td>
<td>• Handpiece stalling</td>
<td>• Rotate dissection tool, then activate foot pedal.</td>
</tr>
<tr>
<td></td>
<td>• Faulty attachment</td>
<td>• Clean or replace attachment.</td>
</tr>
<tr>
<td></td>
<td>• Handpiece lock engaged</td>
<td>• Unlock handpiece.</td>
</tr>
<tr>
<td></td>
<td>• Faulty internal component</td>
<td>• Return to DePuy Synthes Power Tools for service.</td>
</tr>
<tr>
<td>Handpiece vibration or extremely hot</td>
<td>• Inadequate lubrication</td>
<td>• Add Anspach oil to AutoLube.</td>
</tr>
<tr>
<td></td>
<td>• Handpiece out of balance</td>
<td>• Return to DePuy Synthes Power Tools for service.</td>
</tr>
<tr>
<td>Excessive vibration of dissection tool</td>
<td>• Dissection tool may be bent</td>
<td>• Replace with new dissection tool.</td>
</tr>
<tr>
<td></td>
<td>• Dissection tool may not be fully seated</td>
<td>• Reassemble dissection tool and attachment.</td>
</tr>
<tr>
<td></td>
<td>• Improper attachment and dissection tool combination</td>
<td>• Only use correct dissection tool with appropriate attachment.</td>
</tr>
<tr>
<td></td>
<td>• Possible attachment bearing damage</td>
<td>• Return attachment to DePuy Synthes Power Tools for service.</td>
</tr>
<tr>
<td>Black Max Lever will not lower</td>
<td>• Dissection tool not seated properly</td>
<td>• Reassemble dissection tool and attachment.</td>
</tr>
<tr>
<td></td>
<td>• Debris built up inside handpiece</td>
<td>• Remove attachment, lift lever, and tap distal tip of handpiece against hard surface until debris is dislodged.</td>
</tr>
<tr>
<td></td>
<td>• Broken dissection tool in handpiece</td>
<td>• Lift lever, tap distal tip of handpiece against hard surface until dissection tool is dislodged.</td>
</tr>
<tr>
<td>XMAX System knurled knob will not secure</td>
<td>• Dissection tool not seated properly</td>
<td>• Reassemble dissection tool and attachment.</td>
</tr>
<tr>
<td></td>
<td>• Debris built up inside handpiece</td>
<td>• Remove attachment and tap distal tip of handpiece against hard surface until debris is dislodged.</td>
</tr>
<tr>
<td></td>
<td>• Broken dissection tool in handpiece</td>
<td>• Remove attachment and tap handpiece against hard surface until dissection tool is dislodged.</td>
</tr>
<tr>
<td>Attachment is hot</td>
<td>• Debris lodged inside attachment</td>
<td>• Clean attachment, using Anspach attachment cleaning instructions located in this manual.</td>
</tr>
<tr>
<td></td>
<td>• Possible bearing damage</td>
<td>• Return attachment to DePuy Synthes Power Tools for service.</td>
</tr>
<tr>
<td>Craniotome attachment is bent</td>
<td>• Excessive force used in operation</td>
<td>• Do not use; replace attachment.</td>
</tr>
<tr>
<td>Inoperative foot control</td>
<td>• Oil leaking out of AutoLube</td>
<td>• Replace AutoLube filter, check oil level. Do not overfill AutoLube.</td>
</tr>
<tr>
<td></td>
<td>• Faulty air connection</td>
<td>• Check connection at air source.</td>
</tr>
<tr>
<td></td>
<td>• AutoLube was sterilized or submerged in fluids</td>
<td>• Return to DePuy Synthes Power Tools for service.</td>
</tr>
<tr>
<td></td>
<td>• Water in the AutoLube</td>
<td>• Return to DePuy Synthes Power Tools for service.</td>
</tr>
</tbody>
</table>
### XMAX System Attachments

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORT</td>
<td>5 cm Short Attachment</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>8 cm Medium Attachment</td>
</tr>
<tr>
<td>LONG</td>
<td>11 cm Long Attachment</td>
</tr>
<tr>
<td>LONG-S</td>
<td>10.5 cm Long Attachment</td>
</tr>
<tr>
<td>LONG-01</td>
<td>10.5 cm Long Attachment, Non-tapered End</td>
</tr>
<tr>
<td>MIA16</td>
<td>16 cm Minimally Invasive Attachment</td>
</tr>
<tr>
<td>SHORT-HD</td>
<td>5 cm Heavy Duty Short Attachment</td>
</tr>
<tr>
<td>MEDIUM-HD</td>
<td>8 cm Heavy Duty Medium Attachment</td>
</tr>
<tr>
<td>LONG-HD</td>
<td>12.4 cm Heavy Duty Long Attachment</td>
</tr>
<tr>
<td>XL-HD</td>
<td>20.2 cm Heavy Duty Extra Long Attachment</td>
</tr>
<tr>
<td>ADG</td>
<td>7.2 cm Adjustable Drill Guide</td>
</tr>
<tr>
<td>CDA</td>
<td>6.8 cm Controlled Depth Attachment</td>
</tr>
<tr>
<td>CRANI-A</td>
<td>6.5 cm Adult Craniotome</td>
</tr>
<tr>
<td>CRANI-A-01</td>
<td>6.5 cm Adult Craniotome, Thin</td>
</tr>
<tr>
<td>CRANI-P</td>
<td>6.5 cm Pediatric Craniotome</td>
</tr>
<tr>
<td>CRANI-L</td>
<td>7.5 cm Large Craniotome</td>
</tr>
<tr>
<td>CRANI-A-R</td>
<td>6.5 cm Rotating Adult Craniotome</td>
</tr>
<tr>
<td>CRANI-L-R</td>
<td>7.5 cm Large Rotating Craniotome</td>
</tr>
<tr>
<td>MA-DRIVER</td>
<td>Straight Driver</td>
</tr>
<tr>
<td>MA-D20</td>
<td>20° Angle Driver</td>
</tr>
<tr>
<td>MA-15S</td>
<td>Bearing Sleeve, 15 cm Straight</td>
</tr>
<tr>
<td>MA-15C</td>
<td>Bearing Sleeve, 15 cm Curved</td>
</tr>
<tr>
<td>MA-15ST</td>
<td>Bearing Sleeve, 15 cm Straight Taper</td>
</tr>
<tr>
<td>MA-19ST</td>
<td>Bearing Sleeve, 19 cm Straight Taper</td>
</tr>
<tr>
<td>MA-10S</td>
<td>Bearing Sleeve, 10 cm Straight</td>
</tr>
<tr>
<td>MA-10C</td>
<td>Bearing Sleeve, 10 cm Curved</td>
</tr>
<tr>
<td>ORANGE-45</td>
<td>45° Contra Angle Attachment</td>
</tr>
<tr>
<td>ORANGE-90</td>
<td>90° Right Angle Attachment</td>
</tr>
<tr>
<td>QD8</td>
<td>8 cm Quick Disconnect Angle Attachment</td>
</tr>
<tr>
<td>QD8-S</td>
<td>7.5 cm Quick Disconnect Angle Attachment</td>
</tr>
<tr>
<td>QD11</td>
<td>11 cm Quick Disconnect Angle Attachment</td>
</tr>
<tr>
<td>QD11-S</td>
<td>10.5 cm Quick Disconnect Angle Attachment</td>
</tr>
<tr>
<td>QD14</td>
<td>14 cm Quick Disconnect Angle Attachment</td>
</tr>
<tr>
<td>QD14-S</td>
<td>13.5 cm Quick Disconnect Angle Attachment</td>
</tr>
<tr>
<td>CSR60</td>
<td>Perforator Driver with Hudson End</td>
</tr>
<tr>
<td>DRIVER</td>
<td>Keyless Driver</td>
</tr>
<tr>
<td>MM-SAGITTAL</td>
<td>Sagittal Saw</td>
</tr>
<tr>
<td>O-SAW</td>
<td>Oscillating microSaw Attachment</td>
</tr>
<tr>
<td>R-SAW</td>
<td>Reciprocating microSaw Attachment</td>
</tr>
<tr>
<td>S-SAW</td>
<td>Sagittal microSaw Attachment</td>
</tr>
<tr>
<td>SA-JACOBS</td>
<td>Small Attachment, Jacobs Chuck</td>
</tr>
<tr>
<td>SA-JLATCH</td>
<td>Small Attachment, J-Latch</td>
</tr>
</tbody>
</table>

### Black Max Attachments

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-SILVER</td>
<td>6.1 cm Attachment</td>
</tr>
<tr>
<td>B-TURQUOISE</td>
<td>5.9 cm Attachment</td>
</tr>
<tr>
<td>B-VIOLET</td>
<td>8.2 cm Attachment</td>
</tr>
<tr>
<td>B-BLUE-S</td>
<td>11.25 cm Attachment</td>
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<tr>
<td>B-TURQ-L</td>
<td>12.6 cm Attachment</td>
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<tr>
<td>B-GREY-MIA16</td>
<td>16 cm MIA</td>
</tr>
<tr>
<td>B-BLACK</td>
<td>19 cm Attachment</td>
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<tr>
<td>B-RED</td>
<td>26.65 cm Attachment</td>
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<tr>
<td>B-MRA-S</td>
<td>9.4 cm Revision Attachment</td>
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<tr>
<td>B-MRA-M</td>
<td>16.5 cm Revision Attachment</td>
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<tr>
<td>B-MRA-L</td>
<td>22 cm Revision Attachment</td>
</tr>
<tr>
<td>B-ORANGE-45</td>
<td>Contra Angle Attachment (Multiple Angle)</td>
</tr>
<tr>
<td>B-ORANGE-90</td>
<td>Right Angle Attachment (90°)</td>
</tr>
<tr>
<td>B-GREY-ADG</td>
<td>8.7 cm Adjustable Drill Guide Attachment</td>
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<tr>
<td>B-TURQ-CDA</td>
<td>Controlled Depth Attachment</td>
</tr>
<tr>
<td>B-GOLD</td>
<td>Large Craniotome</td>
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<tr>
<td>B-GOLD-R</td>
<td>Rotating Large Craniotome</td>
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<tr>
<td>B-GREEN</td>
<td>Standard Craniotome</td>
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<tr>
<td>B-GREEN-R</td>
<td>Rotating Green Craniotome</td>
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<tr>
<td>B-TURQ-X</td>
<td>Pediatric Craniotome</td>
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<td>B-QD8</td>
<td>8 cm Angle Attachment</td>
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<tr>
<td>B-QD8-S</td>
<td>7.5 cm Angle Attachment</td>
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<td>B-QD11</td>
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<td>B-QD14</td>
<td>14 cm Angle Attachment</td>
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<tr>
<td>B-QD14-S</td>
<td>13.5 cm Angle Attachment</td>
</tr>
<tr>
<td>MA-15S</td>
<td>Bearing Sleeve, 15 cm Straight</td>
</tr>
<tr>
<td>MA-15C</td>
<td>Bearing Sleeve, 15 cm Curved</td>
</tr>
<tr>
<td>MA-10S</td>
<td>Bearing Sleeve, 10 cm Straight</td>
</tr>
<tr>
<td>MA-10C</td>
<td>Bearing Sleeve, 10 cm Curved</td>
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<tr>
<td>MA-15ST</td>
<td>Bearing Sleeve, 15 cm Straight Taper</td>
</tr>
<tr>
<td>MA-19ST</td>
<td>Bearing Sleeve, 19 cm Straight Taper</td>
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<tr>
<td>MA-15ST</td>
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<td>Bearing Sleeve, 19 cm Straight Taper</td>
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<tr>
<td>B-SAGITTAL</td>
<td>Black Max Sagittal Saw</td>
</tr>
<tr>
<td>BM-DRIVER</td>
<td>Keyless Driver</td>
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</table>
### IMRI Instrument System
- **IMRI-MOTOR**: iMRI Handpiece
- **IMRI-FOOT-CTRL**: iMRI Air Control
- **IMRI-SHORT**: iMRI Short Attachment
- **IMRI-SHORT-HD**: iMRI Short HD Attachment
- **IMRI-CRANI-A**: iMRI Crani-A Attachment
- **IMRI-S-4B**: 4 mm Fluted Ball
- **IMRI-S-1004TD**: 1 mm x 4 mm Twist Drill w/Stop
- **IMRI-S-1R**: 1.4 mm x 12.8 mm Fluted Router
- **IMRI-A-CRN**: 1.85 mm x 16 mm Fluted Router
- **IMRI-SHD-6B**: 6 mm Fluted Ball
- **IMRI-S-8NS-M**: 3 mm Fluted Matchstick, extends 8.9 mm less
- **IMRI-OIL**: iMRI Synthetic Oil

### Pneumatic Accessories
- **ACB**: Attachment Cleaning Brush
- **SDCB**: Small Diameter Cleaning Brush
- **AL-III-IRR-MA7**: Foot Control for Irrigation System, MA7 Adapter
- **AUTOLUBE-III**: Foot Control
- **AUTOLUBE-III-DISS**: Foot Control, DISS Adapter
- **AL-III-DISS-20**: Foot Control with 20' Hose, DISS Adapter
- **AUTOLUBE-III-FG**: Foot Control with Foot Guard
- **AUTOLUBE-III-FG7**: Foot Control with Foot Guard, MA7 Adapter
- **AUTOLUBE-III-IRR**: Foot Control for Irrigation System
- **AUTOLUBE-III-MA7**: Foot Control, MA7 Adapter
- **AUTOLUBE-III-NK**: AutoLube/Foot Control with Nitrogen Keyed Adapter
- **AUTOLUBE-III-20**: Foot Control with 20' Hose
- **AL-III-30**: Foot Control with 30' Hose
- **AL-III-DISS-30**: Foot Control with 30' Hose, DISS Adapter
- **FILTER-II**: AutoLube II and III Filters (5/pkg.)
- **OIL-II**: Instrument Oil w/1 Replacement Filter for AutoLube -II and -III
- **HOSE**: 20-Foot Air Extension Hose
- **HOSE-5**: 5-Foot Air Extension Hose
- **HOSE-10**: 10-Foot Air Extension Hose
- **HOSE-10-DISS**: 10-Foot Air Extension Hose with DISS Adapter
- **HOSE-15-DISS**: 15-Foot Air Extension Hose with DISS Adapter
- **HOSE-20-DISS**: 20-Foot Air Extension Hose with DISS Adapter
- **HOSE-DISS**: 10-Inch Air Extension Hose with DISS Adapter
- **B-CASE-TRAY**: Sterilization Case with Tray
- **MM-CTR-RACK**: Cutting Burr Rack
- **XM-CASE**: Sterilization Case with Tray
- **PG**: Pistol Grip for Black Max
- **SCHRADER-F**: SCHRADER Adapter, Female
- **05.001.078**: Lubricant for Anspach Systems, 110 ml
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WARNING: In the USA, this product has labeling limitations. See package insert for complete information.

CAUTION: USA Law restricts these devices to sale by or on the order of a physician.
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Not all products are currently available in all markets.