 The EU directive 93/42/EEC was applied in the design and production of this medical device.

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Specifications are subject to change without notice.

'11.11.02 

OPERATION MANUAL

NSK

 0197

Dismantling Surgical Handpiece

Ti-Max ~~X-DSG20L~~ / ~~X-DSG20~~
~~X-DSG20Lh~~ / ~~X-DSG20h~~

Please read this Operation Manual carefully
before use, and file for future reference

MADE IN JAPAN

OM-C0463E



Powerful Partners®

**CAUTION**

This handpiece is used only for the NSK Surgical Unit with torque calibration. (eg. Surgic Pro series)

Intended to Use

The handpiece is designed only for surgical use by qualified personnel.

**WARNING**

DO NOT CONNECT X-DSG20 and X-DSG20h to OPTIC motor. It can not lock the head and it may disassemble during the operation

CAUTION

- When operating the handpiece always consider the safety of the patient.
- Operators must wear eye protection and mask when operating this handpiece.
- Check for vibration, noise and overheating outside the patient's oral cavity before use. If any abnormalities are found, stop using the handpiece immediately and contact dealer.
- Do not attempt to disassemble the handpiece or tamper with the mechanism except we recommended on this Operation Manual.
- Supposing the unexpected malfunction during the surgery, NSK recommend to arrange spare handpiece.
- Lubricate by spray oil (PANA SPRAY plus).
- This handpiece is non-sterilized. Autoclave before use.
- Depressing the push-button while the handpiece is rotating will result in OVERHEATING of the handpiece head. Special caution must be exercised during use to keep cheek tissue AWAY from the push-button of the handpiece. Contact with cheek tissue may cause the push-button to depress and burn injury to the patient may occur.
- Should the handpiece function abnormally, cease operation immediately and return the handpiece to dealer for repair.
- Ball-bearing of the handpiece inside is consumable parts. If you use it bad situation, handpiece will overheat and it may

cause burn injury.

- Do not allow any impact on to the handpiece. Do not drop the handpiece.
- Be sure to NOT use the bur or drill below. It may cause bur brake or run out.
 - Bended, deform, anisomorous (worn), rusted-out, deficient bur/drill.
 - Bur/Drill which has a crack in edge or an axis.
 - Bur/Drill outside standard.
- Always keep the bur/drill shank clean. Debris in the chuck mechanism can prevent burs from seating properly and cause them to fly out during use.
- Do not use the bur or drill other than NSK recommend. It becomes cause of malfunction and accident.
- Before use always check that the bur/drill is correctly seated and locked in place. During operation, make sure the bur /drill are secure.
- Do not exceed the drive motor speed recommended the bur manufacturers. If the rotary speed which the manufacturer of bur nominates is lower than spec of handpiece, do not use it.
- Do not operate the handpiece without the bur/drill.
- In the case of filling water, confirm that water is filled from the filling ports of the water filling nozzle and the drill before use. And confirm that there is no water leak from the side of the head cap.

- Do not connect or disconnect the handpiece until the drive motor has completely stopped.
- Do not use excess pressure on the treatment area.
- After each use, be sure to clean, lubricate and sterilize the handpiece. If blood is left on the handpiece, it can clot causing rust. Neglect lubrication may cause OVERHEATING.
- Do not wipe with, or clean or immerse in, high acid water or sterilizing solutions.
- Perform periodical maintenance checks.
- If the handpiece has not been used for a long period, check for noise, vibration, and overheating before use.
- If blood infiltrates into an Implant or Surgical handpiece, cleaning is difficult in Care 3 plus. In this case, clean in PANA SPRAY plus/PANA SPRAY.

2. Connecting / Disconnecting the Handpiece

2-1 Connecting

Push the handpiece on to the motor taking care to keep it in alignment. Twist the handpiece until it locks into position with a clicking sound.

2-2 Disconnecting

Hold the motor and the handpiece, and pull out it straight.

WARNING

DO NOT CONNECT X-DSG20 and X-DSG20h to OPTIC motor. It can not lock the head and it may disassemble during the operation.

CAUTION

- Do not connect or disconnect handpiece until the drive motor has completely stopped.
- Check that there are no gap between handpiece and motor.

3. Mounting and Removing Bur / Drill

CAUTION

Do not connect or disconnect the bur/drill until the motor has completely stopped.

3-1 Mounting

- 1) Insert the bur/drill into the head.(Fig. 1 ①)
- 2) Lightly turn the bur/drill until it engages with the latch mechanism. (Fig. 1 ②)
- 3) Push bur/drill inward to click then it locks. (Fig. 1 ③)

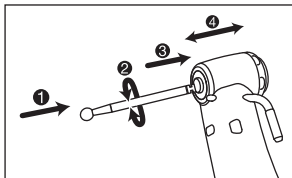


Fig. 1

CAUTION

- After the bur/drill is locked in place, lightly pull out the bur/drill to make sure the bur/drill is locked. (Fig. 1 ④)
- If the bur/drill does not install firmly, it may fly away or it does not remove or cause malfunction or accident.

3-2 Removing

Push the push button with a thumb, and pull out the bur/drill.

4. Check before treatment

Follow the check below, before use. If any abnormalities are found, stop using the handpiece immediately and contact the NSK dealer.

- 1) Check that there are no gap between handpiece and motor.
- 2) Insert the bur/drill.
- 3) Set up the rotation speed that it is recommended the bur/drill manufacturers.(Do not exceed maximum rotation speed for any item)
- 4) Check that there is no abnormal rotation, vibration, noise and overheating.
- 5) If there are no immediate apparent abnormalities, continue to rotate the handpiece for about 1 minute. Then check that there is no abnormal heating on the outer surface.
- 6) Operate it if there are not abnormalities above.

5. Irrigation Nozzle

3 irrigation methods are available; External, Internal or both of them, depending on tool and operation procedure.

5-1 External Spray Nozzle

Connect the Irrigation Tube to the External Spray Nozzle firmly. (Fig.2)

5-2 Internal Spray Nozzle

Only a drill with internal irrigation is used.(Fig.3)

- 1) Set the nozzle holder.
- 2) Insert Irrigation Tube in Internal Spray nozzle.
- 3) Put the Internal Spray Nozzle into the head firmly.
- 4) Put the Internal Spray Nozzle into the slot on the Nozzle Holder.

*Internal Spray Nozzle: Order Code 10000324
Nozzle Holder : Order Code 20000396

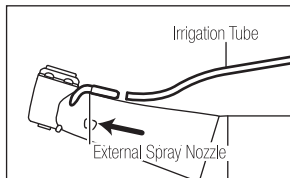


Fig. 2

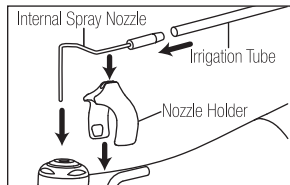


Fig. 3

5-3 External and Internal Irrigation together

Only a drill with internal irrigation is used.

- 1) Connect the ends of the Y-Connector to the External Spray Nozzle and Internal Spray Nozzles refer as detailed in procedures 5-1 and 5-2.
- 2) Connect the Irrigation Tube to the Y-Connector firmly.(Fig.4)

*Y-Connector: Order Code 20000504

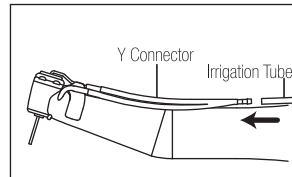


Fig. 4

6. Maintenance after the treatment

CAUTION

Immediately after use, the handpiece should be cleaned, lubricated and sterilized before blood, etc. dries inside the handpiece. If blood is left on the handpiece, it can become clotted and causing rust.

Maintenance is required after each patient as noted below.

6-1 Cleaning

 This handpiece can be washed via Thermo Disinfector.

For detail, refer to the Thermo-Disinfector's Operation Manual.

6-1-1 Handpiece

(1) Dismantling.

- 1) Remove the handpiece from the motor.
- 2) Remove the bur/drill, internal spray nozzle and nozzle holder from the handpiece.

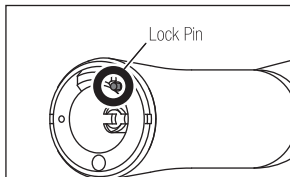


Fig. 5

CAUTION

- For safety reasons, a handpiece that is connected with a motor cannot be dismantled. Make sure to remove the handpiece from the motor to dismantle and wash the piece.
- Check the lock pin (temporary) before dismantling. When the lock pins are inside the handpiece, the piece cannot be dismantled or assembled. In this case, do not force dismantling or assembly of the piece. Request repair.

- 3) Turn the head in the direction of the arrow holding the shank. (Fig.6)
- 4) Pull out the head from the shank. (Fig.7)
- 5) Pull out the Drive shaft from the shank. (Fig.7)

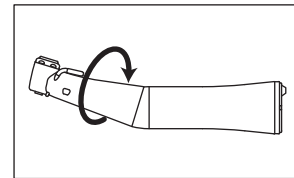


Fig. 6

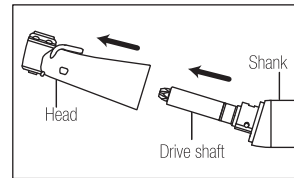


Fig. 7

(2) Washing

- 1) Rinse the dismantled parts thoroughly with neutral or mild alkaline washing solution. If they are very dirty (solidified blood, etc.), it is recommended to use an ultrasonic cleaner.
- 2) Rinse the washing solution thoroughly with running water.
- 3) Immediately after rinsing, assemble the handpiece, wipe the surface dry and then lubricate the handpiece. (Refer to 6-2 Lubrication) Lubrication can drain the inside of the handpiece.

CAUTION

Do not rub the dismantled parts with a brush, etc. If bristles of a brush etc., adhere to the parts and get inside of a product, it can cause a malfunction.

(3) Assembly

CAUTION

After dismantling and washing the parts, assemble them so that the assemblage is the same as before dismantling. Otherwise, noise may be generated or the parts cannot provide full performance. It is useful to check the serial number stamped on each part. And at the time of purchase, all the serial numbers are the same. However, the numbers may be different after repair.

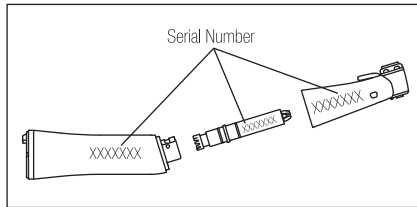


Fig. 8

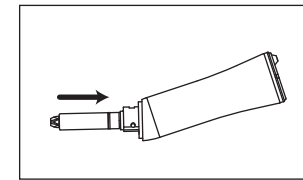


Fig. 9

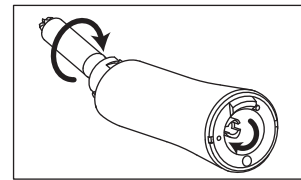


Fig. 10

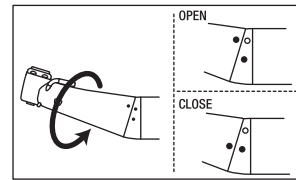


Fig. 11

- 1) Insert the drive shaft until it comes in contact with the shank. (Fig.9)
- 2) Turn the gear at the end of the drive shaft to confirm that they are engaged. (Fig.10)
- 3) Align the mark ● on the head and mark ○ (unlock) on the shank. Insert head until it contact with the shank. At this time, confirm that there is no clearance between the head and the shank. If there is any clearance, the gears of the head and the drive shaft will not engage. Remove the head, turn the gear at the end of the drive shaft and then insert the head again.
- 4) Turn the head in the direction of the mark ● until it clicks. (Fig.11)

CAUTION

When assembling the handpiece on the motor, confirm that the mark ● on the handpiece is aligned. (Fig.11) If the handpiece is assembled on the motor with the mark misaligned, the handpiece cannot be correctly assembled on the motor or the head may come loose and come off.

6-1-2 Spray Nozzle Cleaning

- 1) Clean Internal Spray Nozzle and External Spray Nozzle (internal and external) by using Cleaning Wire. (Fig. 12, 13)
- 2) Insert a Irrigation tube in each Spray Nozzle, and wash it away with clean water.(Refer to 5. (1)(2)).

* Cleaning Wire: Order Code 20000512

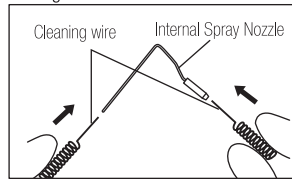


Fig. 12

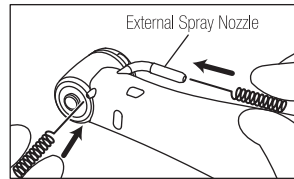


Fig. 13

6-2 Lubrication

- 1) Confirm that the marks on the head and shank are aligned and they are locked.(Fig.14)
- 2) Mount the Spray Nozzle into the Spray Port.
- 3) Insert the Spray Nozzle in rear of the handpiece and spray for approximately 2-3 seconds until foreign material such as blood does not comes out from the handpiece head.

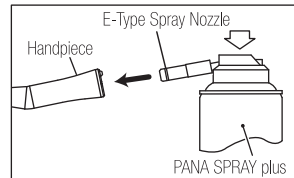


Fig. 14

CAUTION

- Lubrication with the head and shank unlocked or with the marks ● misaligned can cause the head to jump out from the spray pressure.
- If oil is dirty even though the handpiece is lubricated several times as described above, it is possible that the inner parts are worn. Contact the dealer for repair.
- Be sure to hold the handpiece firmly to prevent the handpiece from slipping out of hand by the spray pressure when lubricating.
- Supply lubricant until it comes out of the handpiece head.(at least 2 seconds)
- Hold the spray can upright.

6-3 Sterilization

 This handpiece can be autoclavable up to Max.135°C.

Autoclave sterilization is recommended. Sterilization is required first time you use and after each patient as noted below.

■ Autoclave Procedure:

- 1) Scrub dirt and debris from the handpiece, and wipe clean with alcohol-immersed cotton swab or cloth. Do not use a wire brush.
- 2) Lubricate with PANA SPRAY plus/PANA SPRA to 6-6 Lubrication.
- 3) Insert into an autoclave pouch. Seal the pouch.
- 4) Autoclavable up to max. 135°C.
ex.) Autoclave for 20 min. at 121°C, or 15 min. at 132°C.
- 5) Keep the handpiece in the autoclave pouch to keep it clean until you use it.
*Sterilization at 121°C for more than 15 minutes is recommended by EN13060 or EN ISO17665-1.



CAUTION

- To prevent infectiveness, Autoclave the handpiece every patient.
- The following items can be autoclaved.
Handpiece, Internal Spray Nozzle, Nozzle Holder
Do not autoclave other items(Y Connector and Irrigation Tube)
- Clean and lubricate the handpiece before autoclaving. Autoclaving a handpiece stained with blood or debris could cause damage to the handpiece.
- Do not autoclave the handpiece, even when it is bagged, together with other instruments, from which chemicals are not sufficiently cleaned. This is to avoid discoloration and/or damage to the plating of the handpiece.
- In case the sterilizer chamber temperature could exceed 135°C during the dry cycle, skip the dry cycle.
- Do not wash, soak, or wipe off the handpiece with/in the oxidation potential solution (strong acid, super acid solution) sterilized solution, strong alkaline solution or functional water.
- The handpiece is kept in suitable atmospheric pressure, temperature, humidity, ventilation, and sunlight. Moreover, air does not include a dust, salt and sulfur.
- Do not touch the handpiece just after the autoclave. It may very hot.
- NSK does not recommend you to sterilize on plasma sterilization or EOG sterilization.

7. Glass Rod Cleaning (X-DSG20L / X-DSG20Lh)

Wipe clean the Cellular Glass Optic Rod entry point and exit point with an alcohol-immersed cotton swab or nylon brush. Remove all debris and oil. (Fig.15)

CAUTION

Do not use a pointed tool or sharp edged to clean the Cellular Glass Optic Rod. They may damage the mirror finish and reduce the light transmission efficiency. If Cellular Glass Optic Rod end has become damaged, return it to dealer for repair.

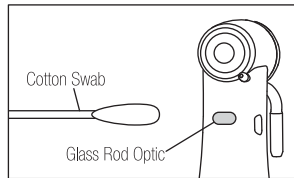


Fig. 15

8. Warranty

NSK warrants the handpiece against production errors and material defects. NSK reserves the right to analyze and determine the cause of any problem. Warranty is voided should the handpiece be not used correctly. Replacement parts are available for seven years beyond discontinuation of the model.