

TORQTECH Operation Instructions

CA-10RC-ENDO

Geared Contra Angle Handpiece

ENDO



Thank you for purchasing the TORQTECH geared contra angle handpiece.

For optimum performance, efficiency, avoiding hazards, preventing patient injury, and safety, read the instruction manual thoroughly before use, and follow all cautionary remarks and usage instructions. Keep this manual in a handy place for ready reference.

The user (e.g., healthcare facility, hospital, clinic, etc.) is responsible for supervising the use and maintenance of medical devices. This instrument must not be used by anyone other than a dentist, doctor or other legally qualified professional.

Eligible Patients for the TORQTECH:

Children to elderly who can stay still during treatment. A person's weight, gender, and nationality are not considered.

This instrument must not be used for any purpose other than the provision of dental treatment.

The following symbols and expressions indicate the degree of danger and harm that could result from ignoring the instructions they accompany:

⚠ WARNING This warns the user of the possibility of serious injury or death to the patient, damage or complete destruction of the instrument or other valuable property, and fire.

⚠ CAUTION This warns the user of the possibility of slight or moderate injury to the patient.



This alerts the user of important points concerning operation of the instrument or the risk of damage to it.

Disclaimer

J. MORITA MFG. CORP. will not be responsible for the following matters, even during the warranty period.

- Malfunction or damage resulting from repairs made by personnel not authorized by J. MORITA MFG. CORP.
- Any unauthorized modifications to its products
- Malfunction or damage resulting from maintenance or repairs carried out using parts or components other than those specified by J. MORITA MFG. CORP.
- Malfunction of or damage to MORITA products caused by products made by other manufacturers unless they were supplied by J. MORITA MFG. CORP.
- Malfunction or damage resulting from failure to observe the safety precautions or operating procedures described in these Operating Instructions
- Malfunction or damage resulting from ambient conditions that do not conform to the operating conditions specified in these Operating Instructions, such as an improper electrical power supply or installation environment
- Malfunction or damage resulting from a natural disaster, such as a fire, earthquake, flood or lightning

J. MORITA MFG. CORP. maintains supplies of service parts for 10 years after discontinuation of their production. For the duration of this period, we will supply replacement parts and be able to repair the product.

- Replace parts as necessary based on the degree of wear and length of use.
- Motor usage and handling: Read all instruction materials thoroughly before use and follow all cautionary remarks and usage instructions.

In Case of Accident

If an accident occurs, this instrument must not be used until repairs have been completed by a qualified and trained technician authorized by the manufacturer.

Standards and Procedures for the Disposal of Medical Devices

If there is a possibility that a medical device is contaminated, the dentist or doctor responsible for the patient's treatment must confirm that it is uncontaminated, and must then have it disposed of by a healthcare facility or an agent licensed and qualified to handle standard industrial waste and industrial waste requiring special treatment.

Maintenance and Inspection

- This instrument should be inspected every 3 months.
- Maintenance and inspection are generally considered to be the duty and obligation of the user, but if, for some reason, the user is unable to carry out these duties, the user may rely on a qualified medical device serviceman. Contact your local dealer or J. MORITA OFFICE for details. Inspect the following items: 1. Micromotor connection. 2. Bur and file insertion. 3. Handpiece rotation. 4. Overheating. 5. Canal length meter display.
- For repairs, contact your local dealer or J. MORITA OFFICE.

Service and Contacts

The TORQTECH may be repaired and serviced by:

- The technicians of J. MORITA's subsidiaries all over the world.
- Technicians employed by authorized J. MORITA dealers and specially trained by J. MORITA.
- Independent technicians specially trained and authorized by J. MORITA.

For repairs or other types of service, contact your local dealer or J. MORITA OFFICE.

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Prohibitions

⚠ PROHIBITION : This indicates when not to use the device.

- Do not use the TORQTECH on patients who have implanted pacemakers or defibrillators.
- No modification of the TORQTECH is allowed.
- Do not perform maintenance while using the TORQTECH for treatment.
- Do not use the wireless transmission devices listed below in the examination area:
 - Cell phone terminals.
 - Wireless transmitting devices such as ham radios, walkie-talkies, and transceivers.
 - Personal Handy-phone System (PHS)
 - Routers for intra-building paging systems, wireless LAN, cordless analogue telephones, and other electric wireless devices.

Warnings and Cautions

⚠ WARNING

- The maximum input rotation for the CA-10RC-ENDO (speed reduction model for endodontics) is 20,000 rpm (2,000 rpm as file rotation). Do not input more than 20,000 rpm. Otherwise, this may result in over-heating the head or the handpiece could be damaged.
- The head heats up if it runs at 2,000 rpm. Do not use it for more than 3 minutes at 2,000 rpm.
- Do not force the handpiece inside the oral cavity if the mouth is not open wide enough. It could contact the opposing tooth, and inadvertently press the push button. Running the handpiece with the push button held down could cause the push button to overheat and damage the opposing tooth. It could also burn the patient or the dentist and the bur or file could come out.
- After maintenance, do not cover the handpiece with gauze when operating it to remove excess oil. If the push button is inadvertently held down, the head could overheat or the handpiece could break down.
- In cases of tooth extractions, split teeth, endodontic treatment etc. or incision or open wounds in soft tissue, the tip air must be turned off to avoid causing a subcutaneous emphysema due to emitted air from the handpiece.
- The CA-10RC-ENDO must not be connected to or used in combination with any other apparatus or system. It must not be used as an integral component of any other apparatus or system.

File Usage

(Nickel-Titanium files are easily broken. Keep the following points in mind to minimize file breakage.)

- Never use excessive force to insert the file.
- Never use excessive force to advance the file down the canal. (Using excessive force could break a Ni-Ti file.)
- All files eventually break due to metal fatigue. Replace old files in a timely manner.
- Never use stretched, deformed or bent files.
- Do not get chemical solutions such as FC or hypo-chlorite on the head or contrary electrode. These could cause inflammation.

Using the Endodontic Contra Angles with Units and Micromotors that Have Canal Measurement Capability

- Before use, read all relevant instructions that come with the dental treatment unit thoroughly.
- Before use, touch the file in the CA-10RC-ENDO with the contrary electrode on the probe cord connected to the dental treatment unit, and make sure all the bars in the meter for the measurement display on the chair light up. If they do not, do not use the handpiece. Something is probably wrong with the display.
- Some files do not work with the built-in electrode inside the CA-10RC-ENDO. Be sure to test the hand-piece as described above.
- The built-in electrode will work for only some types of files. It will not work if there is no conductivity between the file and shank or if the shank does not conduct electricity. Do not use these types of files.
- If a file will not work with the built-in electrode inside the CA-10RC-ENDO, you can install a separate external file electrode that will work.
- Canal measurement cannot be performed with contra angles and micromotors that do not have this capability. For canal measurement, make sure the dental treatment unit, micromotor and CA-10RC-ENDO all have this capability.
- Accurate measurement cannot be performed if the built-in or external file electrode is worn out. Replace the electrode with a new one.
- If the dental treatment unit's canal length indicator measurement readings are unstable, stop using the handpiece immediately and replace the built-in electrode or external file electrode.
- When using canal measurement functions, do not operate this handpiece faster than 1,200 rpm. The meter may be somewhat erratic.
- If a chemical solution such as sodium hypochlorite gets on the head, wash it off immediately. Otherwise, metal contacts could be corroded and prevent accurate measurement of the canal.
- Always use a rubber dam for preparing root canals.

⚠ CAUTION

- Wear safety glasses or similar eye protection to prevent eye injury from cutting debris.
- Run the handpiece outside the oral cavity before using it and make sure the bur or file does not wobble and that it runs at the correct speed and in the right direction.
- If a bur or file comes out during use, stop using the handpiece immediately and have the handpiece repaired.
- Do not press the push button until the handpiece comes to a complete stop. Otherwise, the inside of the button could wear out and make it hard to insert and remove burs or files.
- If the handpiece makes abnormal noise, vibrates too much, or overheats, take out the bur and replace it with a new one. If the same problem persists, have the handpiece repaired.
- Follow all recommendations of the bur manufacturer concerning bur rotation speed and direction.

! Wait for the handpiece to come to a complete stop before inserting or removing burs or files.

! Wait for the bur or file to stop rotating before taking it out of the oral cavity.

! Remove burs and files before returning the handpiece to its holder in the dental treatment unit; otherwise there is a risk of injury or damage.

Specifications

[Specifications may be changed without prior notice due to improvements.]

Geared Contra Angle Handpiece Attachment	
Type	CA-10RC-ENDO
Indications for Use	The TORQTECH transmits rotation of the motor to dental burs or reamers which cut or grind teeth or dentures with the same or transformed rotation.
Rotation Speed Ratio	10 : 1 (reduction)
Maximum Motor Speed [rpm]	20,000
Length [mm]	Approx. 94
Weight [g]	Approx. 55
Usable Burs ^{*1}	Shank Type 1 (CA)
Chuck Type	Push Button
Connectable Micromotors	TR-SII-R-O, TR-S3-R-O ^{*2}
Usable Shank Length for Burs and Files [mm]	Minimum 12
Usable Bur Diameter [mm]	2.334 to 2.350

*1 Use burs that conform to ISO 1797-1

*2 To use canal measurement function with the CA-10RC-ENDO, make sure that both the treatment unit and micromotor have canal measurement capability of the CA-10RC-ENDO.

⚠ WARNING

- Never use the following types of burs and files; they could come out and injure the patient or be swallowed: Those which do not conform to ISO standards. Those with scratched or bent heads or shanks. Those which are rusty, chipped or broken. Those which have been modified or altered such as those having shortened shanks.

⚠ CAUTION

- Even new burs and files are sometimes poorly balanced; if a bur or file makes a loud, metallic noise during rotation, stop using it.

- Spray and tip air are not emitted.



Always use burs and files with clean shanks.

! Always carefully remove all cleaning fluids before inserting a bur into the chuck; some cleaning fluids are corrosive and can ruin the chuck.

* If a dirty bur or file or ones with cleaning fluid have been inserted by mistake, contact your local dealer or J. MORITA OFFICE. to have the handpiece inspected.

Operating, Transport and Storage Environments

Operating Temperature: +10°C to +35°C (+50°F to +95°F); Humidity: 30% to 80% (without condensation); Atmospheric Pressure: 70 kPa to 106 kPa

Transport and Storage Temperature: -10°C to +70°C (+14°F to +158°F); Humidity: 10% to 85% (without condensation); Atmospheric pressure: 70 kPa to 106 kPa

* Do not expose the handpiece to direct sunlight for an extended period of time.

* If the handpiece will not be used for an extended period of time, store it in a clean, dry place after autoclaving it.

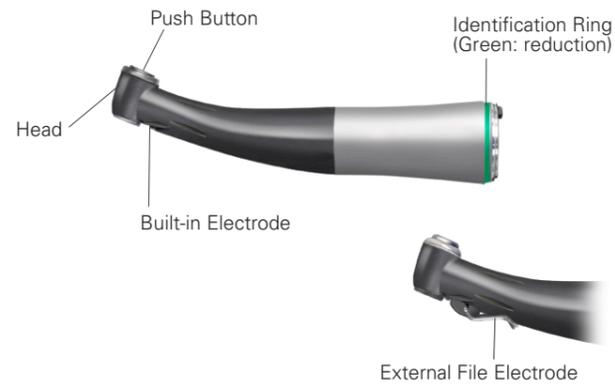
* The useful life of the TORQTECH is 7 years (based on self-certification) from the date of shipment provided it is regularly and properly inspected and maintained.

Symbols

[Some symbols may not be used.]

	CE(0197) marking Conforms with the European Directive, 93/42/EEC. CE marking Conforms with the European Directive, 2011/65/EU.		Serial number E.g., G00001 E.g., L111G00001K Year of Manufacture (G: 2018, H: 2019...)		
	Type BF applied part		Autoclavable up to +135°C (+275°F)		Supports high-temperature cleaning and disinfection
	GS1 DataMatrix		EU authorized representative under the European Directive 93/42/EEC		Refer to instructions for use
	Temperature limitation		Humidity limitation		Atmospheric pressure limitation
	Fragile		Keep away from rain		This way up
	Manufacturer		Date of manufacture		

Parts Identification



Accessories

* For parts that wear out and need periodic replacement, see "Maintenance and Inspection" and "10. Replacement Parts" sections whenever necessary.

Spray Nozzle
Code No. 5071343



(Ethanol disinfectable)

Guide Bar
Code No. 8491763



(Ethanol disinfectable)

* Use the guide bar when replacing the built-in electrode or external file electrode.

External File Electrode (with cap)
Code No. 5071377



(Autoclavable)

Sold separately
LS SPRAY
Code No. 7927568
or 5071340
MORITA MULTI SPRAY
Code No. 7914113
or 5010201
(Ethanol disinfectable)



1. Before Use

*The TORQTECH is not autoclaved before shipping. Be sure to autoclave it before using it for the first time. Follow the instructions below.



Make sure the cap and screw are not loose and that the cap fits flush up against the head. Make sure there are no cracks, misalignment or other defects. Make sure the chuck opening is rust-free and clean. Make sure the joint is clean and not damaged. Connect the handpiece to the micromotor and step on the foot pedal to operate it. Make sure it runs smoothly without any abnormal noise or vibration.

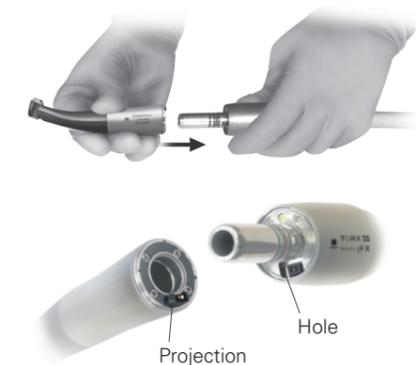
For Canal Measurement

Touch the file with the contrary electrode that is connected to the dental treatment unit and make sure all the bars on the canal measurement display light up clearly without exception.

WARNING

- Do not use the CA-10RC-ENDO if the cap or set screw is loose. These could come off and be swallowed by the patient. Accurate canal measurement may not be performed.

2. Motor Connection



- Make sure the O-rings on the micromotor connection are properly installed.
- To make a canal measurement, connect the TR-SII-R-O or TR-S3-R-O.

Slide the handpiece straight onto the micromotor's connection cylinder. Line up the hole in the motor connections with the projection in handpiece and fit the two together until there is an audible click.

CAUTION

- Make sure the micromotor's connection cylinder is free of dust, dirt, and debris.
- Handle the handpiece carefully. Do not drop it or let it swing and bang against the dental treatment unit. Otherwise, it may result in poor rotation.
- To use canal measurement function with the CA-10RC-ENDO, make sure that both the dental treatment unit and micromotor have canal measurement capability.
- Give the handpiece a light tug before using it to make sure it is securely connected.
- Wait for the micromotor to come to a complete stop before connecting or disconnecting the handpiece.

3. Insert and Remove Burs and Files



Hold down the push button and rotate the file or bur until it lines up with the notch inside the chuck and goes all the way in. Then release the button.

Hold down the push button and pull the bur or file straight out.

WARNING

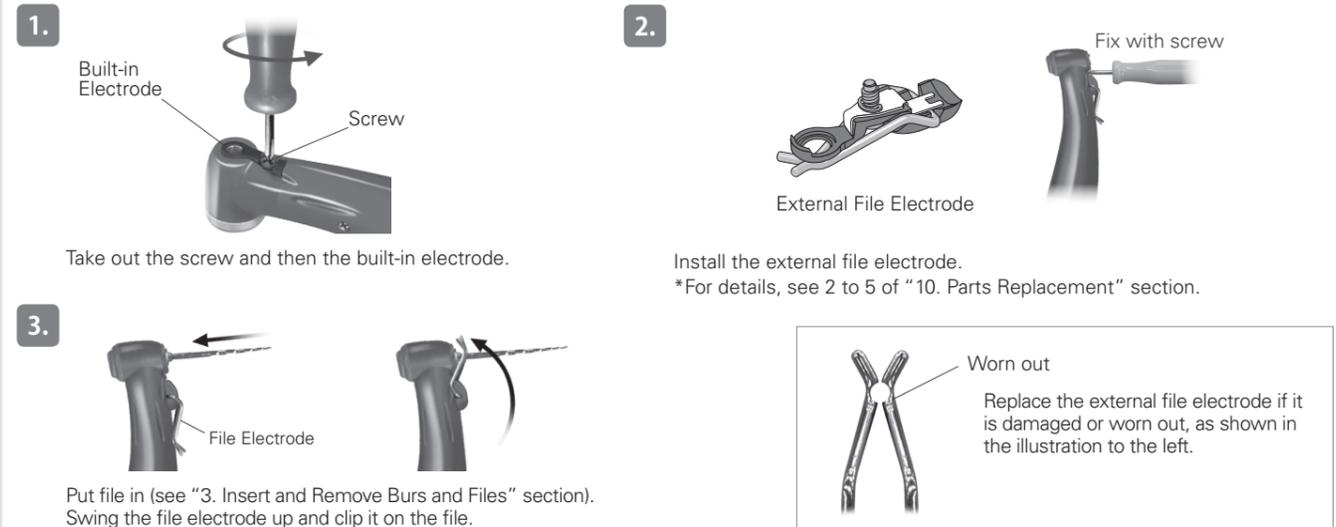
- Make sure files go all the way into the chuck. Give them a light tug to make sure they are securely installed.
- Never use stretched or damaged files.

CAUTION

- Take care not to injure your fingers when inserting and removing burs and files.
- Be sure to push the push button when inserting and removing burs and files. Otherwise, it could damage the chuck and fail to hold burs and files.

Use specified Ni-Ti or stainless steel files.

If there is no conductivity between the file shank and cutting part, install the external file electrode.



WARNING

- Make sure the screw for the file electrode is tightened up properly. If it comes out, it could be swallowed by the patient or accurate measurements may not be made.

CAUTION

- The file electrode may work for some types of files.
- The file electrode cannot be used with files that have a shank diameter greater than 1.2 mm, shanks that are not circular, large cutting heads such as Largo Burs, and Gadsden reamers.
- Do not fit the electrode onto the cutting surface of the file. The file electrode will wear out very quickly.

4. After Use



Take out the bur or file and detach the handpiece from the micromotor.

*Leaving burs or files in the handpiece can make it difficult to get them out later.

5. Cleaning



Clean off the cutting debris in running water with a soft brush.

Be sure to lubricate the handpiece with the LS SPRAY or MORITA MULTI SPRAY after washing it.

6. Disinfection



Wipe the handpiece with a piece of gauze that has been dampened with Ethanol for Disinfection (Ethanol 70 vol% to 80 vol%) and wrung out thoroughly.

- Do not use anything except ethanol. Do not use too much ethanol; it could seep inside and damage the handpiece.
- Never wipe the handpiece with corrosive solutions such as electrolytic acids, strong alkaline solutions, or other special cleaning solutions commonly available.



Operating conditions for high-temperature washer-disinfectors

* When using a high-temperature washer-disinfector to clean the handpiece, strictly adhere to the conditions specified below.

High-temperature cleaning conditions

Unit Name	Mode	Detergent (concentration)	Neutralizer* (concentration)	Rinse (concentration)
Miele G7881	Vario TD	neodisher MediClean (0.3% to 0.5%)	neodisher Z (0.1% to 0.2%)	neodisher Mielclear (0.02% to 0.04%)

* After cleaning, there may be streaks or white spots on the handpiece. Use a neutralizer only if there are streaks or white spots.

Operating Precautions

- Always use a handpiece holder when washing the handpiece, making sure to rinse the inside of the handpiece thoroughly.
- For details on handling medical agents or adjusting their concentration, refer to the user manual for the washing device.
- After washing is complete, check to see if the handpiece, including its inside, is completely dry. If any water remains inside the handpiece, expel it with an air gun or another such tool. Failure to do so could result in the remaining water coming out during use and cause poor lubrication or sterilization.
- Always lubricate the handpiece after washing.
- If the handpiece is washed without using the handpiece holder, it could result in corrosion or clog in the air or water line and damage the handpiece due to impurities or remaining medical agents.
- Inappropriate cleaning methods and solutions will damage the handpiece.
- Do not clean the handpiece using strong acidic or alkaline solutions that could cause the metal to corrode.
- Any moisture left inside the handpiece could result in the remaining water coming out during use and cause corrosion, or poor lubrication and sterilization.
- Do not leave the handpiece inside a high-temperature washer-disinfector.

7. Lubrication

* Lubricate with the LS SPRAY (sold separately) or MORITA MULTI SPRAY (sold separately) before autoclaving and after morning and afternoon treatment sessions.

1



Take out the bur or file and detach the handpiece from the micromotor.

2



Put the spray nozzle on the spray can.

3



Insert the spray nozzle into the connection end of the handpiece, hold it firmly and then spray for about 2 seconds.

⚠ WARNING

- Always cover the handpiece with gauze before spraying. If spray accidentally gets into your eyes, wash them out with plenty of water and see a doctor. Use soap and water to wash off any spray on your skin.
- Do not use the spray in an enclosed area which is not properly ventilated. Do not point the spray nozzle at anyone and do not use the spray near an open flame.

⚠ CAUTION

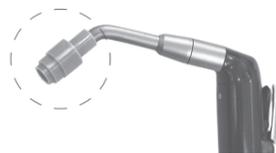
- The handpiece will fail if it is not lubricated and cleaned with the spray regularly.
- Spraying for more than 5 seconds can cause extreme cooling and freezing.

- ❗ Do not use any lubricant except the LS SPRAY or MORITA MULTI SPRAY.
- ❗ Always use the spray bottle in a vertical position. Always use the special spray nozzle provided.

8. Remove Excess Oil



Using an air blow gun, blow the handpiece connection for 20 to 30 seconds to get rid of any moisture left inside the handpiece. Wipe the excess oil from the handpiece with a gauze.



You can use MORITA's threeway syringe instead of an air blow gun. (In this case, attach the air nozzle to the tip of the threeway syringe. The air nozzle comes with a micromotor or its optional accessory.)

⚠ CAUTION

- After handpiece lubrication, be sure to remove the excess oil. If any oil seeps inside the micromotor, it could result in a malfunction. Also, excess oil could cause the handpiece to over-heat.

9. Packaging and Sterilization



Place the handpiece in a sterilization pouch and autoclave it. After autoclaving, store the handpiece in a dry environment.



Recommended Temperature and Time:
In a sterilization pouch, minimum 6 minutes at +134°C (+273.2°F) or minimum 60 minutes at +121°C (+249.8°F)

- * Autoclaving and drying temperatures must not exceed +135°C (+275°F)
- * Minimum drying time after sterilization: 10 minutes

⚠ WARNING

- To prevent the spread of serious, life-threatening infections such as HIV and hepatitis B, the TORQTECH must be autoclaved after finishing the treatment of each patient.

⚠ CAUTION

- Instruments are extremely hot after autoclaving; do not touch them until they cool off.

- ❗ Do not sterilize in any way except autoclave.
- ❗ Remove the bur or file before autoclaving.
- ❗ Failure to clean and lubricate the handpiece before autoclaving will result in a malfunction.
- ❗ The sterilization and drying temperatures must not exceed 135°C (275°F). A drying temperature in excess of 135°C (275°F) will result in contamination of the handpiece or cause it to malfunction.
- ❗ High autoclave temperatures can damage the O-rings etc. Keep the handpiece from directly contacting heat sources or the inside of the autoclave by putting it into a sterilization pouch.
- ❗ Do not leave the handpiece inside the autoclave.

10. Replacement Parts

* If all the canal length indicator bars on the canal measurement display do not light up or if they flicker when the file touches the contrary electrode connected to the dental treatment unit, the built-in electrode or external file electrode is worn out. Replace it with a new one.

Replace Built-in Electrode

1



Loosen the screw and remove the built-in electrode.

2

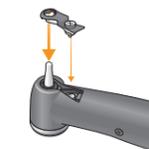


Hold down the push button, insert the guide bar and turn it back and forth until it fits into the latch groove. Then release the push button to secure the guide bar.

⚠ CAUTION

- Always use the guide bar and make sure it will not come out. If the guide bar cannot be properly fixed in place, the internal contact could be bent, and then the instrument might not be able to make accurate measurements or else it might malfunction.
- Do not run the micromotor with the guide bar inserted. This could damage the handpiece.

3



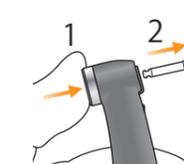
Slide the new built-in electrode onto the guide bar and line up the screw holes.

4



Slowly turn the screw and make sure the built-in electrode goes into the head properly.

5



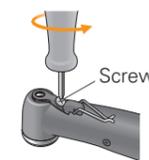
Tighten the screw and then hold down the push button and pull out the guide bar.

⚠ WARNING

- Make sure the screw is tightened properly. Otherwise, it might come out and be swallowed. Also, canal measurements might not be accurate.

Replace External File Electrode

1



Loosen the screw and remove the external file electrode.

2



Hold down the push button, insert the guide bar and turn it back and forth until it fits into the latch groove. Then release the push button to secure the guide bar.

⚠ CAUTION

- Always use the guide bar and make sure it will not come out. If the guide bar cannot be properly fixed in place, the internal contact could be bent, and then the instrument might not be able to make accurate measurements or else it might malfunction.
- Do not run the micromotor with the guide bar inserted. This could damage the handpiece.

3



Slide the new external file electrode onto the guide bar and line up the screw holes.

4



Slowly turn the screw and make sure the external file electrode goes into the head properly.

5



Tighten the screw and then hold down the push button and pull out the guide bar.

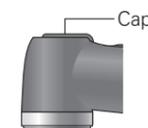
⚠ WARNING

- Make sure the screw is tightened properly. Otherwise, it might come out and be swallowed. Also, canal measurements might not be accurate.

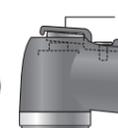
After Replacement

Make sure the cap is properly placed.

OK



BAD



The cap is misaligned.

11. Troubleshooting

Before inspection and adjustment, make sure the dental treatment unit power is on. If the apparatus does not work properly after being inspected and adjusted, contact your local dealer or J. MORITA OFFICE.

◆ Bur or File does not go into chuck.

- Lubricate the handpiece, and then use a new bur or file to check if the problem has been resolved. If this does not resolve the problem, have the handpiece repaired.

◆ Bur does not rotate.

- Make sure the micromotor is properly connected to its tube. Remove the handpiece from the micromotor and step on the foot control. Does the micromotor run?
If micromotor runs:
Make sure the handpiece is connected to the micromotor correctly, then step on the foot control to see the bur runs. If the bur does not run, have the handpiece repaired.
If micromotor does not run:
Refer to the accompany user manual for the micromotor.

◆ Cannot make a canal measurement.

- Touch the file and the contrary electrode together. Do all the meter bars light up without flickering?
If all the meter bars light up:
The handpiece is normal.
If some bars do not light up or they flicker:
Replace the built-in electrode or external file electrode. If this does not resolve the problem, have the handpiece repaired.
- Make sure the fixing screw for the built-in electrode or external file electrode is not loose. If it is not, tighten the screw properly.

For Electronic Measurement

Root Canals Not Suitable for Electronic Measurement

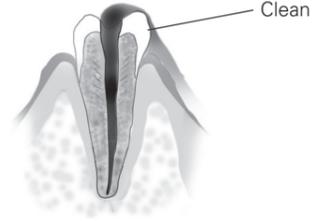
Accurate measurement cannot be obtained with the root canal conditions shown below. There may be cases other than these where an accurate measurement cannot be made.

Root Canal with a Large Apical Foramen



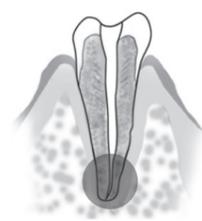
Root canal that has an exceptionally large apical foramen due to a lesion or incomplete development cannot be accurately measured.

Root Canal with Blood Overflowing from the Opening



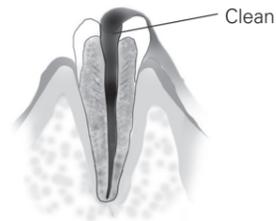
If blood overflows from the opening of the root canal and contacts the gums, this will result in electrical leakage and an accurate measurement cannot be obtained. Wait for bleeding to stop completely. Clean the inside and opening of the canal thoroughly to get rid of all blood and then make a measurement.

Extremely Dry Canal



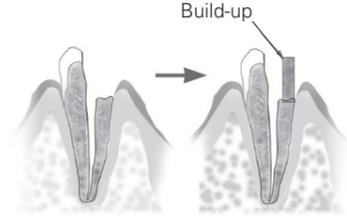
If the canal is extremely dry, the meter may not move until it is quite close to the apex. In this case, try moistening the canal with oxydol or saline.

Root Canal with Chemical Solution Overflowing from the Opening



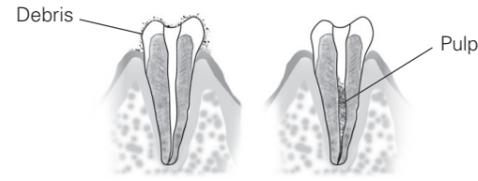
If a chemical solution overflows from the opening of the root canal, an accurate measurement cannot be obtained. Clean the inside and opening of the canal thoroughly to get rid of the chemical solution and then make a measurement.

Broken Crown



If the crown is broken and a section of the gingival tissue intrudes into the cavity surrounding the canal opening, contact between the gingival tissue and the file will result in electrical leakage and an accurate measurement cannot be obtained. In this case, build up a barrier with cement to insulate the gingival tissue.

Cutting Debris on Tooth, Pulp Inside Canal



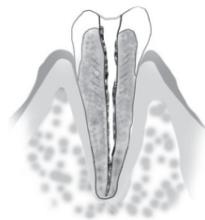
Thoroughly remove all cutting debris on the tooth. Thoroughly remove all the pulp inside the canal; otherwise, an accurate measurement cannot be made.

Fractured Tooth, Leakage through a Branch Canal



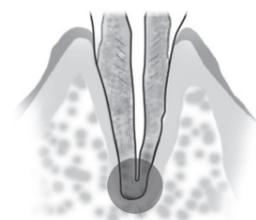
Fractured tooth will cause electrical leakage and an accurate measurement cannot be obtained. A branch canal will also cause electrical leakage.

Re-treatment of a Root Filled with Gutta-percha



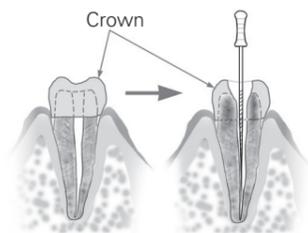
The gutta-percha must be completely removed to eliminate its insulating effect. After removing the gutta-percha, pass a small file all the way through the apical foramen and then put a little saline in the canal, but do not let it overflow the canal opening.

Blocked Canal



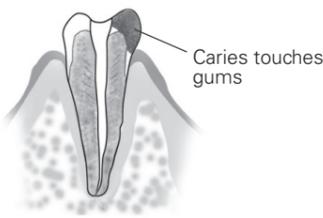
The meter will not move if the canal is blocked. Open the canal all the way to the apical constriction to measure it.

Crown or Metal Prosthesis Touching Gingival Tissue



Accurate measurement cannot be obtained if the file touches a metal prosthesis that is touching gingival tissue. In this case, widen the opening at the top of the crown so that the file will not touch the metal prosthesis before taking a measurement.

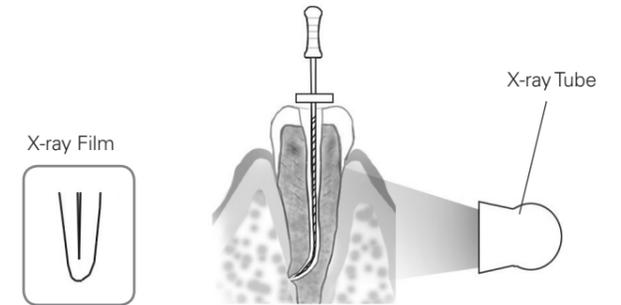
Caries Touching the Gums



In this case, electrical leakage through the caries infected area to the gums will make it impossible to obtain an accurate measurement.

Electrical Meter Readings and Radiography

Sometimes the canal meter reading and the X-ray image will not correspond. This does not mean that the meter is not working properly or that the X-ray exposure is a failure. Depending on the angle of the X-ray beam, the apical foramen may appear to be located differently than it actually is.



In the example above, the X-ray seems to show that the file has not reached the apical foramen because the actual foramen does not correspond with the anatomical apex. This is not uncommon.

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12 Months