

USER'S GUIDE FOR THE
TRI AUTO ZX



**A cordless endodontic treatment handpiece
with built-in electronic apex locator**

USP 5096419 USP 5211556 USP 5295833 DBP 4126753

J. Morita Corp.
Manufactured by J. Morita Mfg. Corp.

Thank you for purchasing the Tri Auto ZX cordless endodontic treatment handpiece with built-in apex locator. For optimum safety and performance, read this manual thoroughly before using the unit and pay close attention to the warnings and notes. Keep this manual nearby for reference.

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IMPORTANT PRECAUTIONS TO PREVENT ACCIDENTS

YOU CAN PREVENT ACCIDENTS

Before operating the Tri Auto ZX, please read the following.

1. Most operation and maintenance problems result from insufficient attention to basic precautions. Problems and accidents are best avoided by foreseeing the possibility of danger and operating equipment in accordance with the manufacturer's recommendations.
2. Before operating this device, read all precautions and instructions pertaining to safety and accident prevention; then, operate the equipment with the utmost caution to prevent either damaging the equipment itself or causing bodily injury.

WARNING Do not use this unit in conjunction with an electric scalpel or on patients who have a pacemaker.

3. Note the meaning of the following symbols and expressions:

WARNING This warns the user of the possibility of bodily injury if the instructions are not followed properly.

[NOTE] This alerts the user to the possibility of damage to the equipment or important points concerning operation and performance.

4. Do not use this equipment for anything other than its specified purpose.

5. The user (e.g. the hospital, clinic, dentist, etc.) is the party responsible for the maintenance and proper operation of the Tri Auto ZX dental device. The Tri Auto ZX dental device must only be operated by licensed dentists.

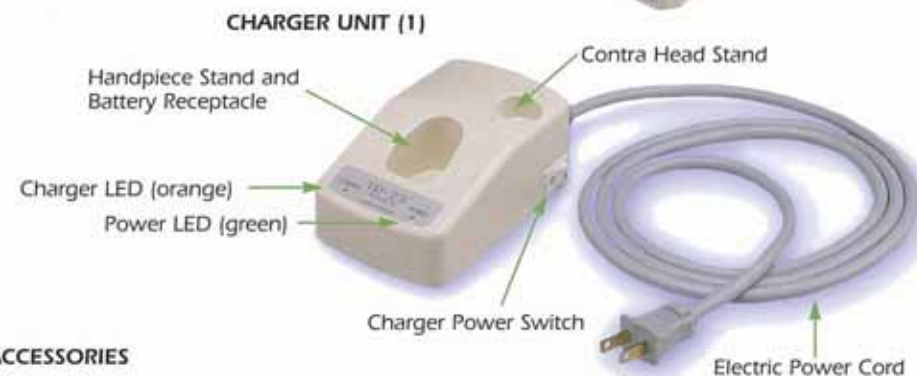
[NOTE]

- The power supply cord is not replaceable in the field. Return the Tri Auto ZX unit to your local dealer for all services.
- The power supply cord and plug serve as a disconnect from the power supply source.

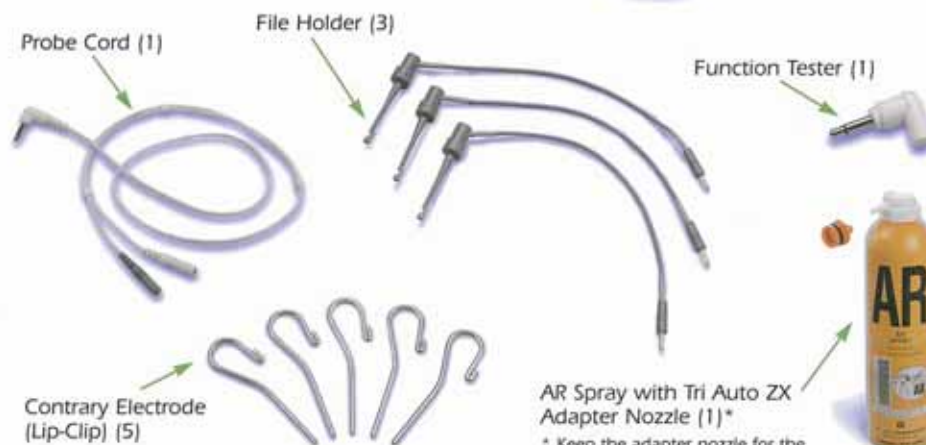
PARTS IDENTIFICATION AND CHECKLIST

PARTS IDENTIFICATION

The following photographs identify the parts and accessories accompanying your Tri Auto ZX. Please check that all parts and accessories are present before proceeding with the use of this product.



ACCESSORIES



SPECIFICATIONS AND SYMBOLS

NAME	Tri Auto ZX
MODEL	TR-ZX
BATTERY CHARGER	
Voltage	A.C. 120V or 230V as inscribed on the bottom of the charger unit
Frequency	50/60Hz
Power Consumption	5 VA
Type of Protection Against Electric Shock	Class II Equipment
Degree of Protection Against Electric Shock	Type B Equipment
HANDPIECE	
Voltage	D.C. 3.6 ± 1V (Ni-MH battery pack)
Power Consumption	2 VA
Operating Temperature Range	10~40°C
Type of Protection Against Electric Shock	Internally Powered Equipment
Degree of Protection Against Electric Shock	Type B Equipment
Speed	280 ± 50 rpm (with no load at D.C. 3.6V)
Chuck Type	Push Button Chuck Release
OUTER DIMENSIONS	
Charger	W 80 x D 123 x H 55mm
Handpiece	W 30 x D 37 x L 212mm
Handpiece Weight	Approx. 160g
Total Weight	Approx. 660g



SYMBOLS

Class II Equipment, Type of Protection Against Electrical Shock



Type B Equipment, Degree of Protection Against Electric Shock

CHARGER POWER SWITCH SYMBOLS:

O : Off

I : On

OVERVIEW OF THE TRI AUTO ZX FEATURES AND FUNCTIONS

GENERAL DESCRIPTION

The Tri Auto ZX is a cordless endodontic treatment handpiece with a built-in apex locator. The Tri Auto ZX is a versatile endodontic instrument and performs three distinct functions. It can be used to:

1. Shape and clean root canals while monitoring the files position inside the canal.
2. Measure the length of the root canal using the apex locator.
3. Operate as a low speed handpiece to make flares and prepare the upper portion of the canal.

Only nickel-titanium files are recommended for use with the Tri Auto ZX handpiece when shaping and cleaning root canals.

KEY FEATURES

- The Tri Auto ZX automatic functions include the following:

Automatic Start And Stop

The cordless handpiece automatically starts when the file enters the root canal and stops when the file is removed.

Automatic Torque Reverse

The cordless handpiece automatically stops and reverses the rotation of the nickel titanium file when too much pressure is applied.

Automatic Apical Reverse

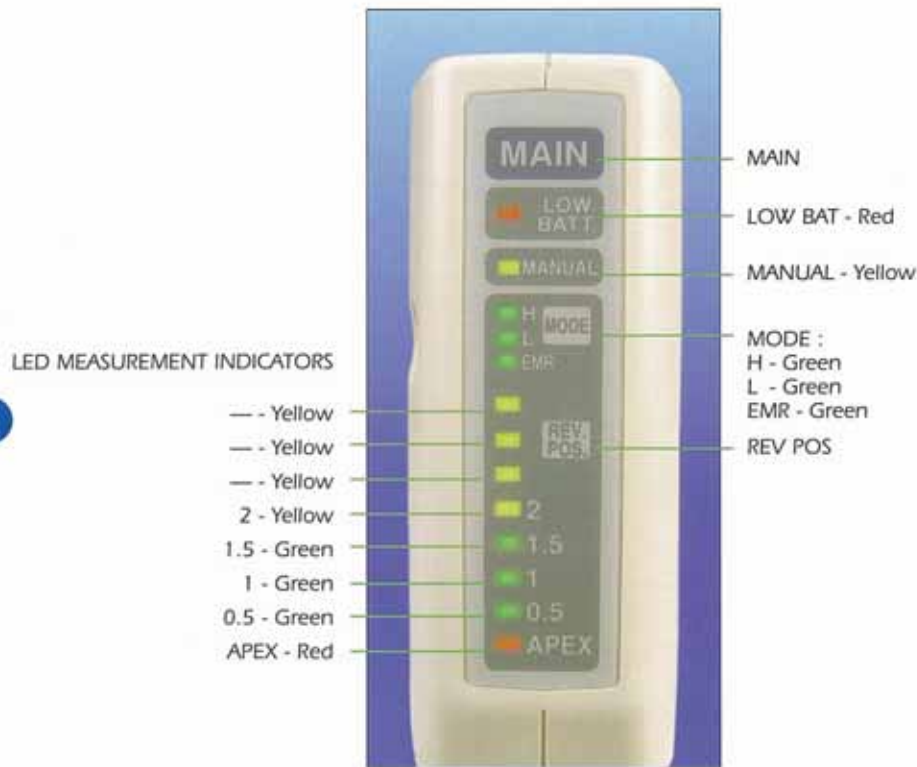
The cordless handpiece automatically stops and reverses the rotation of the file when the file tip reaches a distance from the apex preset by the clinician.

- The handpiece is cordless for maximum flexibility when reaching anterior or posterior teeth.
- A convenient LED control panel on the base of the handpiece can be rotated for easy viewing to accommodate maxillary or mandibular teeth.
- The handpiece motor will automatically shut off after three minutes if the handpiece is not in use to conserve power.
- The position of the file tip is monitored via an LED control panel during root canal shaping and cleaning.
- A choice of Automatic or MANUAL Mode operation increases versatility.

OVERVIEW OF THE TRI AUTO ZX FEATURES AND FUNCTIONS

LOCATION OF HANDPIECE SWITCHES AND LED INDICATORS

LED Control Panel and LED Colors



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Main Switch:

When the main switch is turned on, the LED's for low battery, the low, high, and MANUAL modes, and the apex all light up momentarily as the instrument conducts a self-diagnostic routine. All LED's go out when the main switch is turned off.

Low Battery LED:

This LED will flash RED when the battery is nearly out of power and stays on when the battery is completely out of power.

OVERVIEW OF THE TRI AUTO ZX FEATURES AND FUNCTIONS

Mode Switch:

Press to select one of four modes; MANUAL, High, Low, and EMR.

MANUAL Mode (LED illuminates yellow)

⚠ WARNING

The motor starts as soon as the Tri Auto ZX is placed in MANUAL Mode. Use the main switch to turn the motor on and off in this mode.

The Auto Start and Stop feature and the Auto Torque Reverse functions do not operate in this mode. However, the Auto Apical Reverse works as long as the contrary electrode is placed in the corner of the patient's mouth, the electrode is attached to the file, and all other conditions for tooth measurement are satisfied. The reverse position (REV. POS.) button is used to stop and reverse the rotation of the file in MANUAL Mode only.

High Mode (LED illuminates green)

The motor torque is higher in this mode than in the Low Mode. In High Mode, the motor starts and stops automatically and the Auto Apical and Auto Torque Reverse functions are active. The High Mode function is used with larger size files.

Low Mode (LED illuminates green)

The motor torque is lower in this mode than in High Mode. In Low Mode, the motor starts and stops automatically and the Auto Apical and Auto Torque Reverse functions are active. The Low Mode function is used with small to average size files.

EMR Mode† (LED illuminates green)

† Electronic Measurement of a Root Canal

EMR Mode is the apex locator function. A hand file and file holder are used in this mode. (See **Measuring A Root Canal-EMR Mode** in the **How To Operate** section of this guide) The handpiece motor does not operate in the EMR mode.

Reverse Position Switch:

Press to set the point inside the canal where auto apical reverse will be activated.

LED Measurement Indicators:

These LED's illuminate to show the following length in millimeters from the anatomical apex to the file tip and are activated while shaping and cleaning a canal and in the EMR mode.

- 1 mm: The file tip is approximately 1.0 millimeter away from the anatomical apex.*
- 0.5 mm: The file tip is at the apical constriction.
- APEX: The file tip has reached the anatomical apex.*

* This is also known as the terminus.

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HOW TO ASSEMBLE THE TRI AUTO ZX

PREPARING THE CHARGER

1. Plugging in the Charger

Plug the electrical power cord into a standard electrical receptacle.

[NOTE]

- Be sure that the charger's power switch is turned off before plugging it into an electrical outlet. The power switch is labeled off and on as:
O = off I = on

2. Charging the Handpiece Battery

- Turn the charger on by pressing the ON side of the power switch. The charger's power LED will illuminate green.
- Insert the cordless handpiece into the battery receptacle on the charger. The charge LED will illuminate orange, to signify that the charger is reenergizing the battery.
- Allow approximately 60 minutes to charge the battery after the low battery LED on the handpiece has started to flash or stays on continuously. When the orange charge LED is no longer on, the battery has been fully charged.

[NOTE]

- Always turn the charger off after use.
- Use only the Tri Auto ZX battery charger to recharge the Tri Auto ZX handpiece.
- Do not allow metal objects such as paper clips, water, or other fluids to gather in the battery receptacle or enter into the electrode apertures at the base of the handpiece.

3. When to Charge the Handpiece Battery

- A fully charged battery will last from 30 to 60 minutes.
- The battery is nearly out of power when the low battery LED on the cordless handpiece begins to flash on and off. It is best to charge the battery right away.



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HOW TO ASSEMBLE THE TRI AUTO ZX

[NOTE]

- It is recommended to charge the handpiece only when the low battery indicator light flashes. Recharging the handpiece prior to the flashing indicator light will decrease the life of the battery.

- The battery is completely out of power when the red low battery LED on the handpiece stays on continuously. The battery must be charged at this time.

4. Using the Charger as a Handpiece Stand

The charger can be used as a stand for the handpiece as shown in the photo.

- IMPORTANT:** The battery's working life will be shortened if the charger is turned on when it is being used as a stand. Turn the charger off except when it is being used to recharge the battery.

5. Using the Contra Head Stand

Store the contra head in the receptacle provided on the charger.

For instructions on cleaning, lubricating and sterilizing the Tri Auto ZX, refer to the section on **How To Clean, Lubricate, and Sterilize, The Tri Auto ZX.**



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HOW TO ASSEMBLE THE TRI AUTO ZX

ATTACHING AND REMOVING THE CONTRA HEAD

1. Attaching the Contra Head

Align the large cavity on the underside of the contra head with the projection on the handpiece. Slide the contra head straight onto the handpiece until it clicks into place.

⚠ WARNING

- Test the contra head and handpiece connection by pulling lightly on the contra head to be sure it is securely fastened to the handpiece.
- Never attach or remove the contra head while the handpiece is turned on.

[NOTE]

- Never drop, bump or expose the unit to other kinds of impacts or shocks.

2. Removing the Contra Head

Firmly grasp the contra head and handpiece; pull the contra head away from the handpiece.



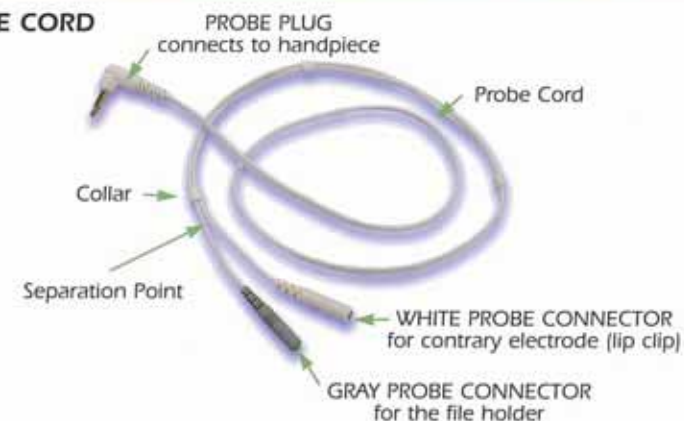
ROTATING THE HANDPIECE BASE TO VIEW LED CONTROL PANEL

The base of the cordless handpiece can be rotated so that the LED control panel can be easily seen regardless of the position of the handpiece in relation to the tooth that is being treated.

HOW TO ASSEMBLE THE TRI AUTO ZX

PREPARING THE PROBE CORD

Slide the collar on the probe cord up or down until it reaches the probe cord separation point, or the point where the probe cord to the white and gray connectors begin to separate.



INSERTING AND REMOVING FILES

1. Inserting Files

- Use only nickel-titanium files with the Tri Auto ZX handpiece.
- Gently pull back the file electrode.
- Hold down the file release button and insert the file into the contra head. Turn the file back and forth until it is lined up with the interior latch groove and slips into place.
- Release the button to lock the file into the contra head.
- Gently clip the file electrode securely onto the file.



HOW TO ASSEMBLE THE TRI AUTO ZX

(Inserting Files)

⚠ WARNING

- Never use files which are elongated or damaged.
- Test that the file is securely fastened; lightly tug on the file to be sure it is securely held in place.
- Never press down on the file release button while the handpiece motor is running.

[NOTE]

- Follow all recommendations of the file's manufacturer.
- Do not attach the file electrode to files with a shaft diameter of 1.2 mm or greater, or large shafted tools such as a Largo burr. The file electrode cannot be attached to files and Gates Glidden reamers which do not have circular shafts. (It is recommended that instruments on which the file electrode cannot be attached be used by setting the handpiece for Manual Mode.)

12. Removing Files

- Gently unclip the file electrode.
- While holding down the file release button, grasp the file and pull it straight out of the contra head.

⚠ WARNING

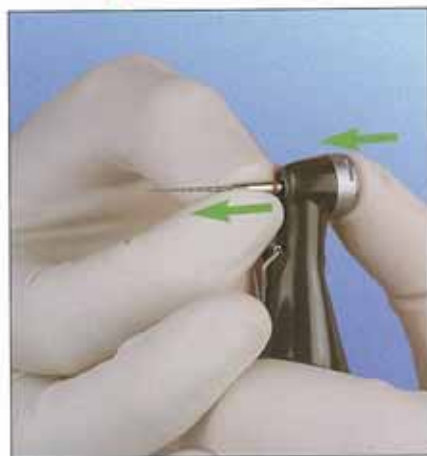
- Use caution when inserting and removing files to avoid injury to fingers.

[NOTE]

- Inserting or removing files without holding down the file release button will damage the internal contra head mechanism.



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HOW TO OPERATE THE TRI AUTO ZX

MEASURING A ROOT CANAL (EMR Mode-Electronic Measurement of a Root Canal)

1. Measuring a Root Canal

- Remove the contra head from the handpiece when measuring a root canal.
- Turn the handpiece on by pressing the MAIN switch on the handpiece.
- Insert the probe cord's plug into the jack on the side of the cordless handpiece. Push the plug all the way into the jack; you will hear it click into place.
- Press the MODE switch to select the EMR mode. Toggle through the four operating mode choices until the EMR LED illuminates green; this indicates that the EMR mode is selected. Then, press the REV. POS. button until it reads 0.5 (the LED flashes).
- Plug the file holder into the probe cord's gray connector. Plug the contrary electrode, also called a lip-clip, into the probe cord's white connector.
- Place the lip-clip (contrary electrode) in the corner of the patient's mouth.
- Attach the file holder onto the shaft of the hand file. (see photo on next page)



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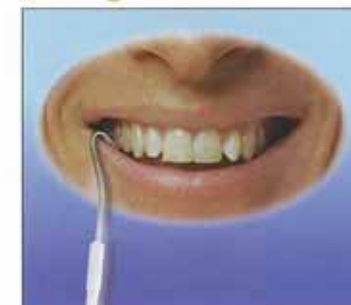
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HOW TO OPERATE THE TRI AUTO ZX

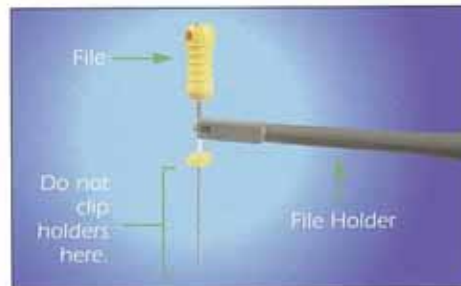
(Measuring a Root Canal)

[NOTES]

- When measuring the length of the canal, use a file or reamer with a plastic handle. Do not use files with metal handles; electrical current conducted through the metal handle and the finger will result in an inaccurate measurement. When using a file with a plastic handle, do not touch the metal part of the file.
 - Always attach the file holder to the upper part of the file near the handle. The metal and plastic parts of the file holder can be damaged if they are attached to the file's cutting part or the transition area from round shaft to cutting part.
- h. Insert the hand file (in most cases a size 10) into the canal. As the file is advanced toward the apex a beeping sound as well as green LED lights indicate the position of the file tip. **With a slow clockwise turn, advance the file until the red LED light illuminates at the apex. The tip of the file is now at the anatomical apex of the root canal.**
 - i. Next, turn the file with a slow counter-clockwise turn until the red LED apex light goes out. The tip of the file is now at the **APICAL CONSTRICTION** where the **0.5 Green LED** illuminates and a rapid tone is heard.
 - j. It is essential that the file be taken to the apex first and then returned to the apical constriction; this insures that the meter is registering the apical constriction. Position the rubber marker on the surface of the tooth as a reference point to determine the canal's working length.
 - k. Turn off the MAIN switch upon completion of canal measurement.
 - If you forget to turn off the MAIN switch, the handpiece will turn itself off automatically in approximately 3 minutes.



1a



1b



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1b

1c



1d

HOW TO OPERATE THE TRI AUTO ZX

(Measuring a Root Canal)

[NOTES]

- Do not use damaged file holders; an accurate measurement cannot be made with a damaged file holder.
- Do not disconnect plugs by pulling on the cord. Always grasp the plastic connectors or finger piece to disconnect plugs.
- The exact working length depends upon the shape and condition of the tooth and its canal. Working length must be determined by the dentist during endodontic treatment procedures.
- If a canal's measurements are inconsistent or unstable, the canal probably cannot be measured accurately. In this case, check the position of the file by taking a radiograph while the file is positioned in the root canal.

GUIDELINES FOR ROOT CANAL MEASUREMENT

The following will assist in understanding the root canal measurement function and in obtaining more accurate canal measurements.

1. Always turn the unit on before plugging in the attachments and probe. Do not attach the file holder and place the lip-clip (contrary electrode) in the patient's mouth and then turn the unit on; this will not allow the unit to accurately calibrate canal measurements.
2. **Dry the pulp chamber and the coronal portion of the tooth. Although the canal is usually a wet environment with sodium hypochlorite, water, blood, local anesthetic, or pulpal fluids, the coronal portion of the pulp chamber must be kept dry. If there is moisture in the coronal portion of the tooth, the electrical current may be conducted into the soft tissue or possibly contact a metal restoration and give an instant apex reading. It is important to clean and dry the chamber; cotton may be used to dry the coronal portion of the tooth.**
3. Always advance the file until an apex reading is obtained. It is essential that the file be taken to the APEX measurement first, then returned to the apical constriction (0.5 mm reading).
4. Take measurement readings before proceeding with instrumentation. Canal measurement with Tri Auto ZX is best obtained before filling the canal. If there is difficulty obtaining a consistent reading when introducing the file to the canal, it is recommended to remove more tissue. If no reading occurs, it is possible that a large canal exists and a larger file is needed, or the canal may be calcified.

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HOW TO OPERATE THE TRI AUTO ZX

DETECTING APEX PERFORATION

1. The Tri Auto ZX can be used to detect apex perforation by a file.

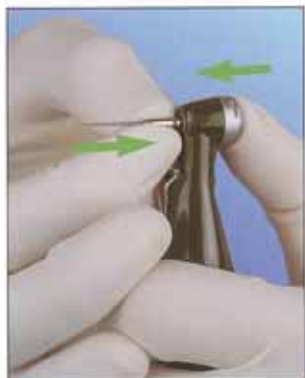
If the file perforates the apex, the Tri Auto ZX will sound a single sustained beep and the APEX LED indicator will begin flashing red.

2. The Tri Auto ZX can be used to detect a lateral apex perforation by a post.

Clip a large file onto the file holder and touch the post with it. If the post has perforated the lateral wall, the Tri Auto ZX will sound a single sustained beep and the APEX LED indicator will begin flashing red.



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SHAPING AND CLEANING THE ROOT CANAL

1. Shaping and Cleaning the Root Canal

- a. Before using the Tri Auto ZX for canal shaping, use a small file, such as #10 or #15, to penetrate the canal manually up to the apex and then return to the apical constriction.
- b. Insert the appropriate nickel-titanium file into the contra head of the Tri Auto ZX.
- c. Turn the handpiece on by pressing the MAIN switch.
- d. Plug the probe cord into the cordless handpiece.
- e. Insert the base of the contrary electrode into the probe cord's white connector. Place the lip-clip in the corner of the patient's mouth.
- f. Select either Low or High Mode on the LED control panel.
- g. Set the position for the Auto Apical Reverse function. Press the reverse position (REV. POS.) button until the desired setting (2, 1.5, 1, 0.5, or APEX) is selected.



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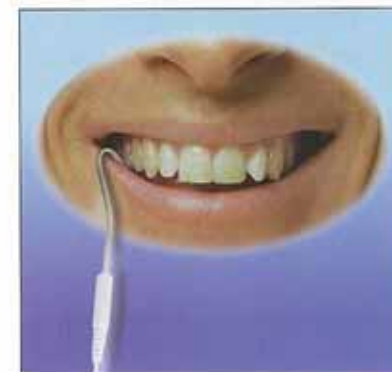


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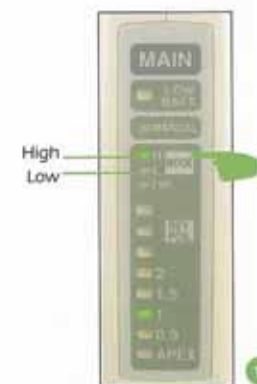
HOW TO OPERATE THE TRI AUTO ZX

(Shaping and Cleaning the Root Canal)

- h. When the file is inserted into the canal it will begin to rotate automatically. Advance the file down the canal to shape and clean it. Do not exert excessive force.
- i. When the tip of the file reaches the point inside the canal specified by the reverse position setting, the file will stop rotating and then rotate in the opposite direction. This is the Auto Apical Reverse function. An audible signal sounds when this happens.
- j. The file will also stop and reverse its rotation if more than the specified amount of force is applied to it. This is the Auto Torque Reverse function.
- k. The file stops rotating as soon as it is taken out of the canal. This is the Auto Start and Stop function.
- l. Gradually increase the size of the file until the shaping and cleaning is completed. Twenty-one (21) millimeter files are available for treating molars.
 - If the file's rotation makes it difficult to get it into the canal, remove the contrary electrode (lip-clip) from the patient's mouth and insert the file into the canal. Then, replace the contrary electrode to start the file.
 - If there is unusual resistance or the Auto Torque Reverse function is triggered, pull the file back up the canal 3 or 4 mm and then carefully reinsert it. Do not force the file into the canal.
 - The file could break if it is forced down the canal or pressed too hard against the wall of the canal.
- m. Avoid creating "steps" inside the canal during canal shaping and cleaning. Do not rotate the file at the same point inside the canal for a long period of time.
- n. The most consistent results are obtained by combining shaping with rinsing the canal with hydrogen peroxide, sodium hypochlorite or other suitable solutions for canal irrigation.



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HOW TO OPERATE THE TRI AUTO ZX

(Shaping and Cleaning the Root Canal)

- o. After shaping and cleaning the root canal, use an ultrasonic scaler to clean and debride the canal.

WARNING

- Do not inadvertently allow the file to touch the patient's oral mucosa or teeth that are not being treated. This will automatically start the motor.
- Do not allow the metal part of the top of the contra head to touch the patient's oral mucosa. This could redirect the current and result in inaccurate measurement of the canal. (There is, however, no danger of electrical shock to the patient.) It is strongly suggested to use a rubber dam when using the Tri Auto ZX.
- After considerable use, the electrical insulation used in the contra head could become worn. This can result in incorrect readings for the length of canals and other false readings as well as causing the motor to start up automatically when it should not. (Refer to the section: How to Test Functions: Inspecting The Contra Head.)
- Do not press the push button on the contra head up against the teeth opposite the one being treated. This can result in incorrect readings or cause the motor to start automatically.



[NOTES]

- Canal shaping and cleaning cannot be performed entirely with the Tri Auto ZX; use this instrument in conjunction with standard manual techniques for root canal shaping and cleaning. Stop using the instrument immediately if tactile sensation indicates an unusual or abnormal condition inside the canal.
- The file electrode must be clipped onto the file for accurate measurement and instrument control. (In some cases, a canal cannot be measured because of an overflow of blood or chemicals or because the canal is blocked.)

HOW TO OPERATE THE TRI AUTO ZX

(Shaping and Cleaning the Root Canal)

[NOTES]

- For difficult to reach areas, such as maxillary molars, it may be easier to insert the file into the canal before activating the handpiece power; this can be done in one of two ways:
 1. Insert the file into the canal prior to placing the contrary electrode (lip-clip) in the corner of the patient's mouth. The file will start rotating as soon as the lip-clip is placed in the patient's mouth.
 2. It is also possible to insert the file into the canal prior to turning on the MAIN switch.
- The Auto Start feature may not function if the canal is too dry. In this case, fill the canal with a small amount of hydrogen peroxide, sodium hypochlorite, or water; do not let it overflow, as it will interfere with proper canal measurement.
- An accurate measurement cannot be made if the file electrode makes contact with the oral mucosa.
- Do not position the file electrode on any of the grooves on the shaft of the file.
- Do not attach the file electrode to files with a shaft diameter of 1.2 mm or greater, or large shafted tools such as a Largo burr. The file electrode cannot be attached to files and Gates-Glidden reamers which do not have circular shafts. (It is recommended that instruments on which the file electrode cannot be attached be used by setting the handpiece for MANUAL Mode.)
- The file electrode eventually wears out and must be replaced approximately every 6 months; an accurate measurement cannot be made with a worn file electrode.
- Do not use stainless steel files; only use nickel-titanium files. It may take some practice and experience to learn to use nickel-titanium files effectively. It is suggested that the clinician practice on extracted teeth or root canal models.
- Nickel-titanium files are more easily broken by the amount of torque applied to them than stainless steel files. Keep the following points in mind to minimize the possibilities of file breakage.
 - Before using a nickel-titanium file, penetrate the canal up to the apical constriction with an ordinary file first.
 - Never use excessive force to insert the file or advance the file down the canal.
 - All foreign matter, such as bits of cotton, should be removed from the canal before using the file.
 - Nickel-titanium files will eventually break due to metal fatigue; do not use the same file to treat more canals than the file manufacturer recommends.
 - Do not use the files on canals which have a high degree of curvature.
 - Try not to trigger the auto torque reverse mechanism when advancing the file down the canal.
 - Do not skip any sizes when moving up from smaller to larger files. Files which are too large for the canal break more easily.
 - Do not use the same file continuously for more than 10 seconds in one position.

HOW TO OPERATE THE TRI AUTO ZX

USING MANUAL MODE

WARNING

- If the Tri Auto ZX is set for MANUAL Mode, it will start running as soon as the MAIN switch is turned on.

[NOTE]

- The Auto Start And Stop and Auto Torque Reverse functions do not work in MANUAL Mode. MANUAL Mode uses the same Auto Apical Reverse setting that is in the High (H) Mode. Be sure to check the Auto Apical Reverse setting in High Mode before using the MANUAL Mode. The Auto Apical Reverse function works only if the lip-clip (contrary electrode) is placed in the corner of the patient's mouth and the file electrode is attached to the file and all other conditions for tooth measurement are satisfied.

1. When to Use MANUAL Mode

- a. Use the MANUAL Mode for tools with a shaft diameter of 1.2 mm or greater and for #8 or larger files.
- b. Use the MANUAL Mode to make flares, or to prepare the upper portion of the canal.
- c. Use the MANUAL Mode when the canal cannot be measured because of an overflow of blood or chemicals or because it is blocked. (The Low and High Modes cannot be used if the canal cannot be measured.)

HOW TO OPERATE THE TRI AUTO ZX

2. Auto Apical Reverse in MANUAL Mode

MANUAL Mode uses the same Auto Apical Reverse setting that is set in the High (H) Mode. Set the Auto Apical Reverse setting by pressing the MODE button until "H" is illuminated. Then press the reverse position (REV.POS.) button until the desired setting (2, 1.5, 1, 0.5 or APEX) is selected.

3. Setting MANUAL Mode

- a. Press the MODE switch and repeat several times until the LED for MANUAL Mode illuminates yellow. The handpiece motor will start.
- b. In MANUAL Mode, the file's rotation can be reversed by holding down the reverse position (REV.POS.) button. Release the reverse position button to return to forward rotation of the file.

[NOTE]

- Do not use the Tri Auto ZX in MANUAL Mode when performing delicate operations near the apical foramen since the Auto Start And Stop and Auto Torque Reverse functions do not work in MANUAL Mode.



20



21

21

HOW TO OPERATE THE TRI AUTO ZX

CHANGING THE SOUND VOLUME

1. About the Sound Volume

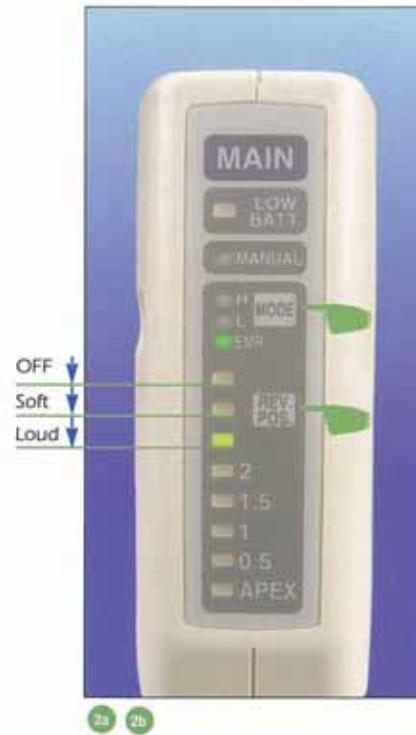
There are 3 settings for the sound volume: loud, soft, and off. Once the setting has been changed, it stays as it is even if the main switch is turned off and on. The sound level is represented by the LED indicators opposite the REV.POS. switch and ranges from loud to soft to off.

2. How to Adjust the Sound Volume

- Turn the Tri Auto ZX on by pressing the MAIN switch. Press the MODE switch and select EMR. Do not release the MODE switch after selecting the EMR mode.
- Without releasing the MODE switch, select the desired setting by pressing the REV.POS. (reverse position) switch. Each press of the switch will change the position of the illuminated LED one step in the direction indicated by the arrows in the illustration.

[NOTE]

- Do not release the MODE switch until the desired setting has been selected.
- After selecting the desired setting, release the MODE switch.
 - Turn the Tri Auto ZX off by pressing the MAIN switch.



2a 2b

HOW TO TEST THE TRI AUTO ZX FUNCTIONS

INSPECTING THE CONTRA HEAD

1. When and How to Inspect the Contra Head

[NOTE]

- After considerable use, the electrical insulation used in the contra head could become worn. This can result in incorrect readings for the length of canals and other false readings as well as causing the motor to start up automatically when it should not.

- Always inspect the contra head before use.
- Insert the plug for the probe cord into its jack on the handpiece.
- Turn the MAIN switch on and touch the metal part on the top of the contra head with the contrary electrode (lip-clip) on the probe cord.
- If this action causes the canal length LED's to light up or activates the handpiece motor, then the contra head's electrical insulation is worn. The contra head must be sent to J. Morita USA, Inc. for repair.



1c

USING THE FUNCTION TESTER

[NOTE]

- The function tester is used to make sure the cordless handpiece and its canal measurement function are working properly. In order to do this, the reverse position (REV.POS.) must be set on APEX.

- Testing the Root Canal Measurement Function of the Lip-Clip, File Holder, and Probe Cord
 - Turn on the Tri Auto ZX MAIN switch, and press the reverse position (REV.POS.) until it is set on APEX. Press the MODE switch to put the handpiece in EMR mode.



1d

HOW TO TEST THE TRI AUTO ZX FUNCTIONS

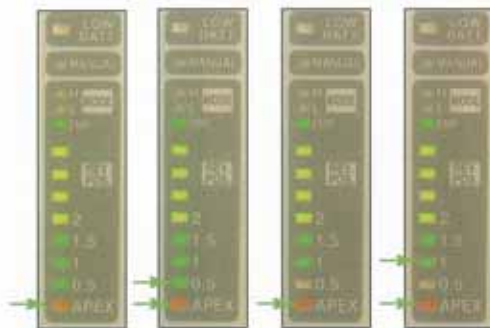
(Testing the Root Canal Measurement Function of the Lip-Clip, File Holder, and Probe Cord)

- b. Plug the probe cord into the handpiece with the contrary electrode (lip-clip) and the file holder attached properly. Next, touch the middle of the function tester's jack with the metal portion of the file holder. Then, simultaneously, touch the end of the function tester's jack with the lip-clip (contrary electrode).
- c. If the instrument is working properly, the measurement LED's will all light up in sequence, beginning at the top. All the LED's will stay on except the 0.5 LED and APEX (or occasionally the 1.0 LED) which will flash on and off.

2. Testing the Cordless Handpiece Circuitry and Canal Measurement Function

- a. Turn on the Tri Auto ZX MAIN switch, and press the reverse position (REV.POS.) until it is set on APEX. Press the MODE switch to put the handpiece in EMR mode.
- b. Plug the function tester into the jack on the cordless handpiece.
- c. This instrument is working properly when it matches with one of the following four displays.

Flashing light



1c 2c → Flashing light

TOUCH THE METAL PART OF THE FILE HOLDER HERE



TOUCH LIP-CLIP HERE (contrary electrode)

1b



2a



2b

HOW TO CLEAN, LUBRICATE AND STERILIZE THE TRI AUTO ZX

AUTOCLAVABLE COMPONENTS

1. The following items **CAN** be autoclaved up to 135° C (275° F):
 - Contra head
 - File holder
 - Contrary electrode
 - a. All instruments, components etc., should be thoroughly washed and cleaned before autoclaving. Any chemicals or foreign debris left on instruments could cause them to malfunction or could cause discoloration.
 - b. It is highly recommended that instruments be autoclaved in a sterilization pouch or similar device.
 - c. Resin (plastic) instruments are especially subject to discoloration and shape distortions by chemicals and oils and should always be autoclaved separately from instruments which are used with chemical solutions, oils, etc..
 - d. Sterilization and drying temperatures must not exceed 135° C (275° F).

NON-AUTOCLAVABLE COMPONENTS

1. The following items **CANNOT** be autoclaved:
 - Cordless handpiece
 - Charger
 - Probe cord
 - Function tester
 - a. Disinfect the handpiece, charger, probe cord, and function tester by wiping them with gauze dampened with alcohol. It is also possible to cover the cordless handpiece with a plastic "shield" during use.

[NOTE]

 - Only use disinfecting alcohol; do not use other types of alcohol.
 - b. Do not get chemicals and medications like formalin cresol and sodium hypochlorite on the handpiece. Many chemicals commonly used for treatment can discolor or deform the plastic and metal parts of the handpiece. Wipe off any chemicals that contact the handpiece immediately.

CLEANING, LUBRICATING AND STERILIZING THE CONTRA HEAD

[NOTE]

- Always clean and lubricate the contra head with AR Spray before autoclaving it.

HOW TO CLEAN, LUBRICATE AND STERILIZE THE TRI AUTO ZX

(Cleaning, Lubricating and Sterilizing)

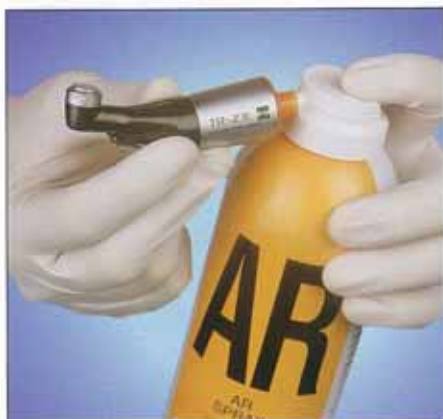
1. Procedure for cleaning, lubricating and sterilizing the Contra Head.
 - a. Use a piece of gauze or other suitable material to carefully wipe and clean the contra head with disinfecting alcohol before lubricating.
 - b. Lubricate the contra head with AR Spray after use and prior to sterilization. Use the Tri Auto ZX adaptor nozzle with the AR Spray.
 - c. Place the end of the contra head in the wide adaptor nozzle and hold it in place while spraying the lubricant for 2-3 seconds.
 - d. The spray will cause the contra head to slightly lift off the nozzle. Take care to hold it securely in place. Remove the nozzle and wipe off any excess spray on the outside of the contra head.
 - e. Place the contra head into a sterilization pouch. Autoclave the contra head according to the autoclave manufacturer's instructions for sterilizing small equipment.
 - f. Leave the contra head in the autoclave for at least twenty (20) minutes at 135° C (275° F).
 - g. Remove the contra head from the sterilization pouch as soon as it has been sterilized and attach it to the cordless handpiece.

⚠ WARNING

- Do not direct the spray toward anyone.

[NOTE]

- Always use the spray can in an upright position.
- Do not wipe the contra head or cordless handpiece with solutions containing formalin cresol or hypochlorite. These chemicals will damage plastic components. Immediately wipe these chemicals off if they get on the instrument.
- The cordless handpiece could malfunction if the head is lubricated and used without being autoclaved. In this case, the excess spray inside the contra head must be carefully removed before it is reattached to the handpiece. Stand the contra head up in the recess provided for it on the charger (ie.: the contra head stand). Allow the excess spray lubricant inside the contra head to drain out into its stand before using the contra head. Wipe out the excess lubricant that collects in the bottom of the contra head stand, and clean this recessed area by wiping it out with disinfecting alcohol.



3c

HOW TO REPLACE PARTS FOR THE TRI AUTO ZX

REPLACING THE FILE ELECTRODE

An accurate measurement cannot be made if the file electrode is worn out by prolonged use. Replace it about every 6 months, if it breaks, or if it shows excessive wear. File electrodes can be ordered from your local dealer.

⚠ WARNING

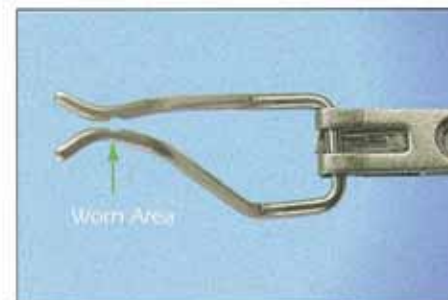
- Replace the file electrode when it is worn out to the extent indicated in the illustration. It could break if used after reaching this point.

[NOTE]

- You will need a miniature Phillips head screwdriver to replace the file electrode.

1. Procedure for Replacing the File Electrode

- a. Remove the file from the contra head by pressing the file release button.
- b. Clean the contra head by wiping it with disinfecting alcohol. Very carefully clean the area where the file electrode clips the file, and the small screw which retains it in place.
- c. Remove the file electrode's retaining screw.
- d. Pull the file electrode straight out.
- e. Position the new file electrode as shown, and slide it into its attachment slot.
- f. Replace the retaining screw and tighten it into place.
- g. Check that the new file electrode can be properly clipped onto a file.



1b



1c



1d



1e

HOW TO REPLACE PARTS FOR THE TRI AUTO ZX

REPLACING THE BATTERY

The battery will last for approximately 1 year under normal circumstances and use. Replace it when it starts to lose power relatively quickly after being fully charged. Use only batteries which are specially designed for the Tri Auto ZX. These batteries can be ordered from your local dealer.

1. Procedure for Replacing the Battery

- Slide the battery cover off in the direction indicated by the arrow in the photo.
- Remove the expired battery and disconnect it.
- Connect the new battery and place it in the battery case. Route the cords as shown in the photo.
- Place the battery cover back on the handpiece.



1a



1b

[NOTE]

- Be careful not to pinch the battery cord when replacing the cover.
- Dispose of old Ni-MH batteries in an environmentally safe way and in strict accordance with local regulations.
- Always disconnect the battery during shipping or if the instrument will not be used for a relatively long time.



1c

REPLACEMENT PARTS FOR THE TRI AUTO ZX

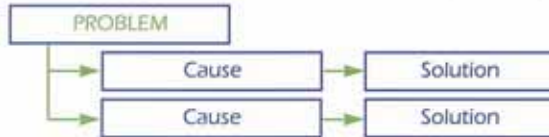
REPLACEMENT PARTS LIST



NO.	CODE	PART NAME	REFERENCE
1	7503710	Tri Auto ZX Probe Cord	
2	7503670	File Holder (gray) [set of 5]	
3	7503680	Contrary Electrode (Lip-Clip) [set of 5]	
4	7503735	File Electrode	
5	7503740	Tri Auto ZX Ni-MH Battery	
6	7503720	Function Tester	
7	7503750	Tri Auto ZX AR Spray Nozzle	
8	5010212	AR Spray	
9	7503770	Tri Auto ZX Contra Head	
10	7503780	Tri Auto ZX Charger	
11	7503785	Tri Auto ZX Handpiece (without battery and contra head)	

TROUBLESHOOTING FLOWCHART

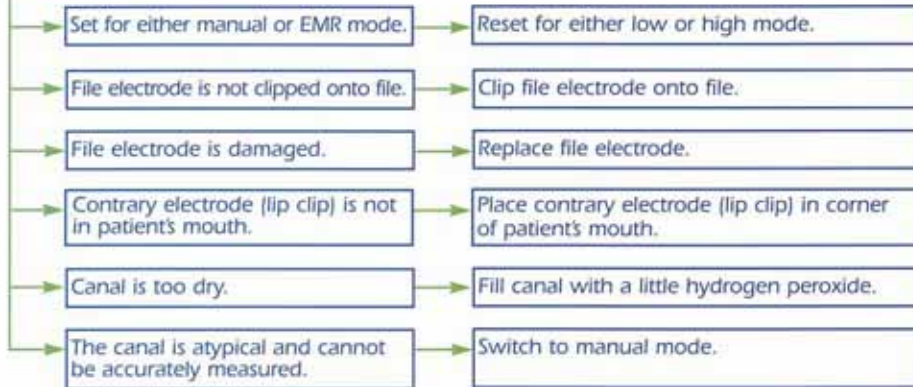
For optimum performance, refer to the flowcharts below to solve operation problems.



MOTOR DOES NOT RUN OR QUILTS IN A SHORT TIME



NO AUTO START



MOTOR IS TOO SLOW

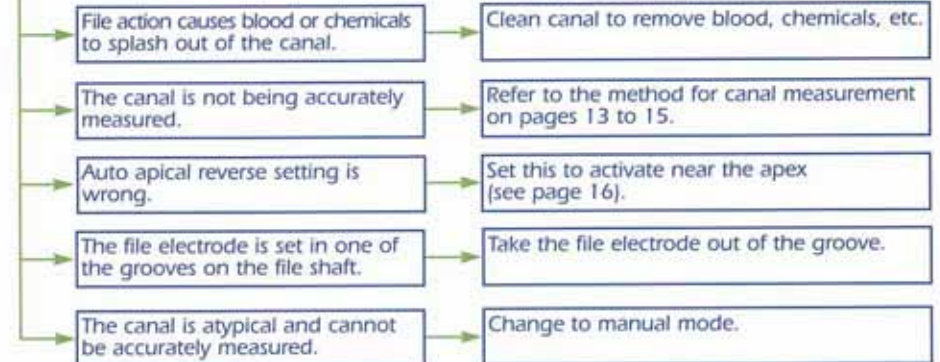


AUDIBLE SIGNALS DO NOT SOUND



TROUBLESHOOTING FLOWCHART

MOTOR KEEPS GOING IN REVERSE



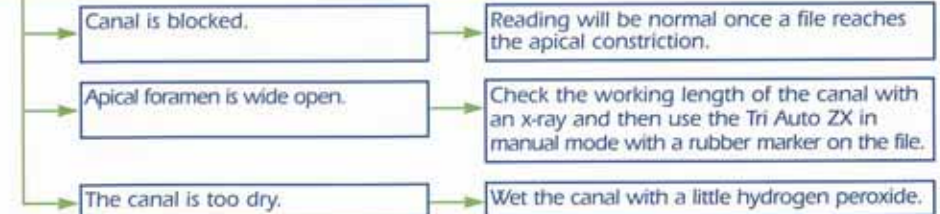
THE INSTRUMENT MAKES A STRANGE SOUND



MEASUREMENT LEDS GIVE INCONSISTENT READINGS

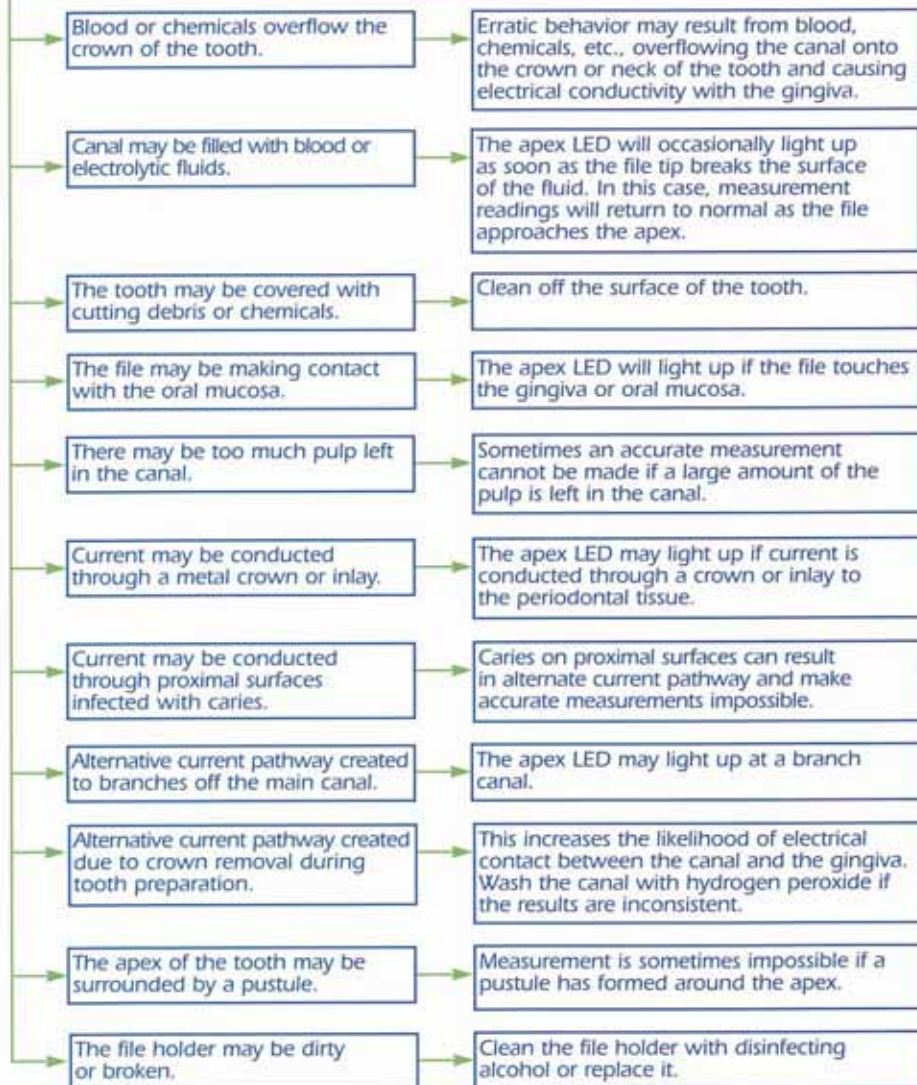


MEASUREMENTS LEDS DO NOT LIGHT UP (OR LIGHT UP ONLY NEAR THE APEX)



TROUBLESHOOTING FLOWCHART

APEX LED LIGHTS UP RIGHT AWAY (SHORT, IMPRECISE, OR INCONSISTENT READINGS)



WARRANTY

1 YEAR LIMITED WARRANTY

1. The manufacturer gives a worldwide guarantee for one year beginning from the date of purchase. Within this period any defect which is due to faulty manufacture or material will be remedied by repair or replacement at the option of the manufacturer or its distributor.
2. Warranty repair and service: In the event of a claim under this guarantee, the appliance is to be sent to the service facility of the distributor, **postage and shipping paid**, including a short description of the problem, and a copy of the sales receipt from the dealer as proof of purchase and title to warranty. **Always ship prepaid. Distributor does not accept collect shipments.**
3. In the case of damage caused by wear and tear, careless handling and repairs not carried out by an authorized service facility, the warranty ceases to be valid. This guarantee may not form the basis for any claims for damages, in particular not for compensation of consequential damages. The buyer assumes responsibility for damage due to dropping of the unit, improper use and utilization of product and chemicals other than those stated in this instruction manual for cleaning. It is the customer's responsibility to maintain the exact rated voltage indicated at the bottom of the unit, and the office maintains electrical outlets for proper performance of the unit.
4. **This warranty does not include the external accessories, file electrode, batteries, or transportation costs.**



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The authority granted to the authorized representative, MEDICAL TECHNOLOGY PROMEDT Consulting GmbH, by J. Morita Mfg. Corp. is solely limited to the work of the authorized representative with the requirements of the European Directive 93/42/EEC for product registration and incident report.

L-084-1

ATTENTION

The AR Spray formerly used to lubricate the contra head has been replaced with AR Oil. Use the following instructions to clean, lubricate with AR Oil and sterilize the Tri Auto ZX.

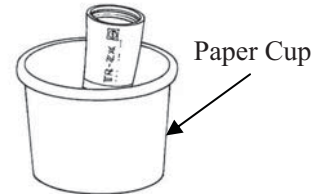


CODE No.7503800

1. Lubrication

* **Lubricate the contra head once a month.**

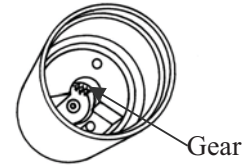
a. Place the contra head in a paper cup with the connection end facing up.



b. Put ten (10) drops of AR oil on the gear and wait for ten (10) minutes.

[NOTE]

- **Leave the contra head in a paper cup for at least ten (10) minutes so that the oil is thoroughly absorbed by the contra head mechanism.**



c. Take the contra head out of the paper cup and wipe off any excess oil which may have seeped out.

2. Autoclave Sterilization

* **It is not necessary to lubricate the contra head before autoclaving it.**

- Wipe the contra head with a piece of gauze and disinfecting alcohol.
- Place the contra head into a sterilization pouch. Autoclave it according to the autoclave manufacturer's instructions for sterilizing small equipment.
- Autoclave the contra head for at least 6 minutes at 135°C (275°F). The drying temperature must not exceed 135°C (275°F).
- Remove the contra head from the sterilization pouch as soon as it has been sterilized and attach it to the cordless handpiece.

[NOTE]

- **Do not wipe the contra head or cordless handpiece with solutions containing formalin cresol or hypochlorite. These chemicals will damage plastic components and also corrode the battery and circuit boards inside the cordless handpiece. Immediately wipe these chemicals off if they get on the instrument.**
- **Do use disposable plastic sleeve to protect the cordless handpiece from any solutions.**

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2007.1. (K) PUB. M9809-1 Printed in Japan

Addenda

WARNING (see pages 10, 12)

- *Make sure that the contrary electrode, file holder, handpiece file electrode etc. do not come into contact with an electric power source such as an electrical socket. This could result in a severe electrical shock.*
- *Do not use an ultra sonic scaler with the contrary electrode attached to the patient. Electrical noise from the scaler could interfere with canal measurements.*

NOTE (see page 10, 12)

- *The contrary electrode could cause an adverse reaction if the patient has an allergy to metals. Ask the patient about this before using the contrary electrode.*
- *Take care that medicinal solutions such as formalin cresol (FC) or sodium hypochlorite do not get on the contrary electrode or the file holder. These could cause an adverse reaction such as inflammation.*

* Working-life

The working-life of this unit is 6 years from the date of shipment provided it is regularly and properly inspected and maintained.

Manufactured by **J.MORITA MFG.CORP.**

'06. 3. 1,500 © PUB. M8074-E-1 Printed in Japan

Addenda (2)

Symbols



The Tri Auto ZX conforms with the European Directive, 93/42/EEC which includes the requirements for electromagnetic compatibility.



Attention, consult accompanying documents.



Manufacturer



Serial Number

Transport and Storage Conditions

- Ambient temperature range: -10°C to + 40°C
- Relative humidity: 10% to 100%
- Atmospheric pressure range: 500hPa to 1060hPa

Manufactured by **J. MORITA MFG. CORP.**

PUB. M8080 Printed in Japan