L&R TEMPO 400

Operating Manual

INDEX

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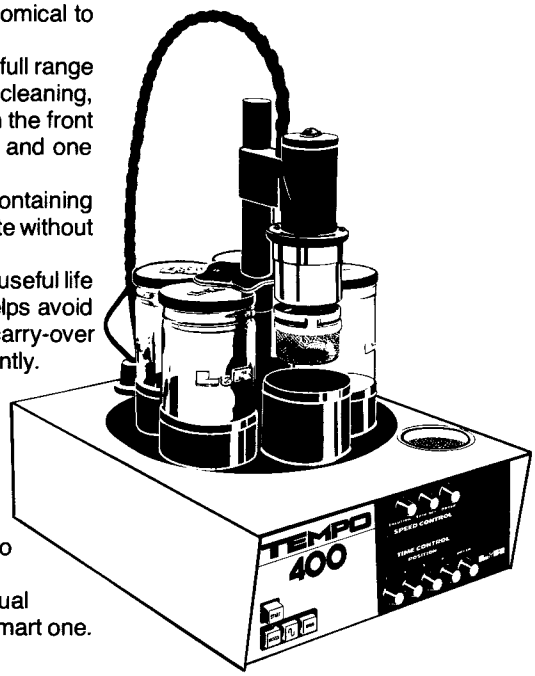
Your new Tempo 400



You are now the owner of the finest, fully automatic watch cleaning machine available, the L&R Tempo 400. Your new Tempo 400 has been designed to be fast, efficient, and economical to operate.

Our L&R engineering gives you maximum control of your Tempo 400. It has a full range of variable speed controls on its front panel for regulating the basket motor in the cleaning, spin-off, and dryer positions. There are also five separate electrical timer controls on the front panel, designed to regulate the time interval for each of four different jar positions and one drying position.

The Tempo 400 electronic circuit is designed with three printed circuit boards containing solid state integrated circuitry. Solid state engineering permits the Tempo 400 to operate without warm-ups at the touch of a switch.

To give you even greater economy, the Tempo 400 has four jars to lengthen the useful life of your solutions. The second, containing L&R Ultrasonic Watch Rinsing Solution,helps avoid the contamination of the L&R Duo-Lube or Solo-Lube Solution that might result from carry-over of the cleaning solutions. Your chemicals, therefore, last longer and work more efficiently.

Your Tempo 400 also has two drying chambers. One is an auxiliary dryer which provides additional drying power, making for greater volume and speed. You can move your work basket to the auxiliary dryer and begin another series of movements through the Tempo 400, thus allowing you to complete more work without spending additional time at the bench.

Finally, your new Tempo 400 is constructed with a unique mechanical system for indexing the turntable from one position to another. No hydraulics are employed to raise the basket.

Now that we've introduced you to your new Tempo 400, use the rest of this manual as a guide and try it out for yourself. You'll soon see why the choice you made was a smart one.

Setting up your Tempo 400

The Tempo 400 should be placed on a solid table or bench, allowing about 30" for its total height. Don't confine the unit. Leave adequate space around the machine for proper ventilation, as well as for easy access to the back and sides. This will also keep the machine clean, and a clean machine aids cleaning results.

Connect the line cord to an adequately grounded electrical outlet (110-120V AC or 220-250V AC) capable of handling approximately 10 Amps. Be sure the outlet is not overloaded with other appliances or lights which may reduce the proper voltage and current.

Special Instructions

THE TEMPO 400, WHEN SHIPPED, WILL BE IN THE "DOWN" DRYING POSITION. TO PREPARE THE MACHINE FOR USE, PLUG IT INTO THE POWER SOURCE, PRESS THE POWER SWITCH, THEN PRESS THE START BUTTON. HOLD IT UNTIL THE BASKET STARTS RISING. IT WILL RISE TO THE NORMAL LOADING POSITION AND STOP. THE MACHINE IS NOW READY FOR USE.

Panel Controls

The switch marked "Power" (push-on, push-off type) will light when pressed, indicating the machine is operable. It may be left on all day, if necessary. Should power fail, or should it be desirable to stop the machine for any reason during the cycle, depress the "Power" switch. When pressed again, the cycle will run the full time set for it.

Immediately above the "Power" switch is another marked "Start". After the loaded basket is placed on the fanwheel and the jars filled with the appropriate L&R solution to the proper level (see page 8), press the switch for a few seconds to start the cycle, which will end at the loading position above the drying chamber. Press the "Start" switch again to begin the next cycle.

The "Ultrasonic" switch (push-on, push-off type) is located to the right of the "Power" switch. It may be pressed with the "Start" switch. As soon as the motor is lowered into any of the jars, ultrasonic activity will be seen in the solution. This action is also indicated by the "Ultrasonic" switch itself, which lights up during ultrasonic activity. This switch may also be left on all day, as the ONLY time it becomes active is when the basket motor is in the lowered position in the jar. Ultrasonic activity will NOT occur while the motor is in the dryer position.

The "Auxiliary/Dry" switch (push on, push off type) to the right of the "Ultrasonic" switch is used only when the operator wishes to use the auxiliary dryer at the right front corner of the Tempo 400. The switch operates independently, and is used only for the auxiliary dryer, a special built-in accessory for drying metal bracelets, case parts, rings, and other jewelry which require drying after cleaning. The dryer may also be used where additional drying of watch parts is indicated. When the auxiliary dryer is not in use, depress the switch to shut it off.

At the top right of the front panel are three controls under the heading "Speed Control." The first of these is marked "Solution." Turn this dial clockwise to increase basket motor speed while in the cleaning (lowered) position. The speed may be adjusted to suit your own preferences. However, a moderately slow speed is recommended, since excessive speed may create a vortex in the solution and result in spotting and poor transmission of the ultrasonic energy.

The control marked "Spin-off" regulates the speed of the basket motor while in the spin-off position. A moderately fast speed is suggested to remove as much solution as possible, to avoid carry-over of one solution to the next. Nevertheless, some caution should be taken to avoid excessive speeds. Too much speed may create a "wave" in the solution, and cause the basket to pick up solution undoing the effects of efficient spin-off.

The "Dryer" control regulates the basket motor speed in the drying position. A moderate speed is recommended, but your own experience should be the final guide.

As mentioned above, all speeds are INCREASED by turning the dials CLOCKWISE. They may be adjusted at any time, even during a cycle.

The bank of five controls under the heading "Time Control" regulates the time interval the basket motor will remain in any of the five positions. As set in the factory, the Tempo 400 will allow approximately 3 minutes in each position. However, turning the dials CLOCKWISE will LENGTHEN the cycle. Time intervals are adjustable from 10 seconds to approximately 8 minutes in the first jar, and up to 15 minutes in all succeeding jars. Once the dials are set, each cycle will adhere to the indicated times until operator readjustments are made.

To shut off the machine, depress the "Power" switch. When the machine is off, no switch should be lit, unless you have used the "Auxiliary/Dryer" switch. Remember, this switch operates independently of the rest of the circuit, and MUST be shut off separately.

Preparing for operation:

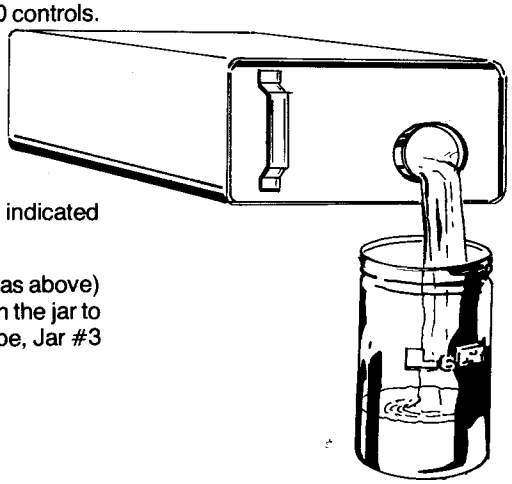
1. Thoroughly wash the jars and baffles, then completely dry them with a lint-free cloth. Place the baffles in the shape of a star into the bottom of the jar. Before placing the jars or baskets in position, run the machine through one cycle without them to insure proper alignment. At this time, DO NOT PRESS THE "ULTRASONIC" SWITCH.

   At this time you should be sure you are thoroughly familiar with the Tempo 400 controls. NOTE: NEVER OPERATE THE MACHINE WITHOUT SOLUTION IN JARS UNLESS THE "ULTRASONIC" SWITCH IS OFF.

2. Jar #1 (right of dryer as you face unit) should be filled with the L&R #566 Watch Cleaning Solution approximately ¾ of the way up the letters "L&R" on the jar (see illustration for spill-free filling of jars). Place this jar in Position #1.

3. Jar #2 should be filled with L&R Ultrasonic Watch Rinsing Solution to the level indicated above, and placed in Position #2, directly to the right of #1.

4. Jar #3 should be filled with L&R Duo-Lube Watch Rinsing Solution #1 (same level as above) and placed to the right of Jar #2. Use the pressure-sensitive Duo-Lube #1 label on the jar to prevent possible confusion when refilling. For those wishing to use L&R Solo-Lube, Jar #3 should be filled with L&R Ultrasonic Watch Rinsing Solution.



5. Jar #4 should be filled with L&R Duo-Lube Watch Rinsing Solution #2 (same level as above) and placed in the remaining spot. Use the pressure-sensitive Duo-Lube #2 label. Jar #4 should be filled with L&R Solo-Lube if this is the desired solution for the cycle.

THE SOLUTION IN THE JARS MUST BE IN CONTACT WITH THE TRANSDUCER. WHEN THE BASKET MOTOR (LOADED) IS LOWERED INTO THE JAR, THE SOLUTION LEVEL SHOULD BE FROM ½" TO ¾" UP THE SIDE OF THE TRANSDUCER. TOO LOW A LEVEL MAY RESULT IN NO CONTACT WITH THE TRANSDUCER AND CAUSE DAMAGE TO THE ULTRASONIC CIRCUIT.

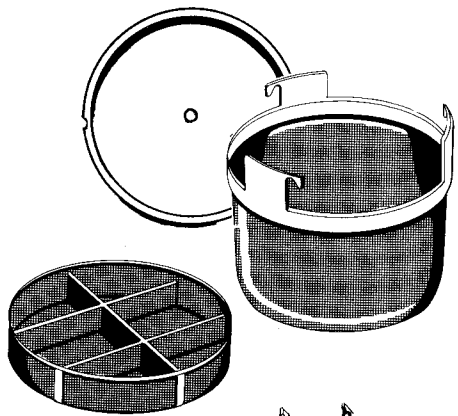
Operating the L&R Tempo 400

Now that your Tempo 400 is set up, it is ready to be used as follows:

1. Press the "Power" switch.
2. Load the selected basket or basket combination with the parts to be cleaned, and mount on fanwheel.
3. Press the "Start" switch for a few seconds to begin the cycle.
4. Press the "Ultrasonic" switch. If it is desirable to operate the machine without ultrasonic action, simply do not press the switch. It may be left on at all times if ultrasonic action is desired.
5. At the end of the complete cycle, the basket motor will rise from the drying chamber and stop at the loading position. The basket should be removed to inspect the parts. If additional drying time is needed, or to extend the time in any posiiton, it is advisable to change the timer for the next load at this point. Now place the basket for further drying on the auxiliary dryer and press the "Auxiliary/Dryer" switch. Another basket can now be placed on the fanwheel and the cycle started again by pressing the "Start" switch. Remember, the auxiliary dryer operates independently of the other circuits, and is operated only by the "Auxiliary/Dryer" switch.

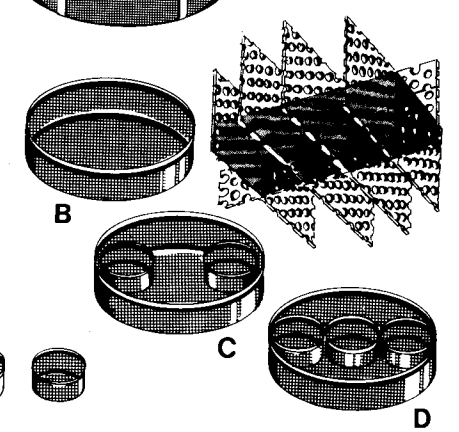
If you prefer to change the basket motor speed or time cycle during the first cleaning cycle, it is suggested you do so while the Tempo 400 is in operation so you can observe the various motor speeds and time intervals until you have achieved the cycle and speeds you prefer. A little experimentation will help you arrive at the exact program that suits you best.

A Word About Baskets and Associated Parts

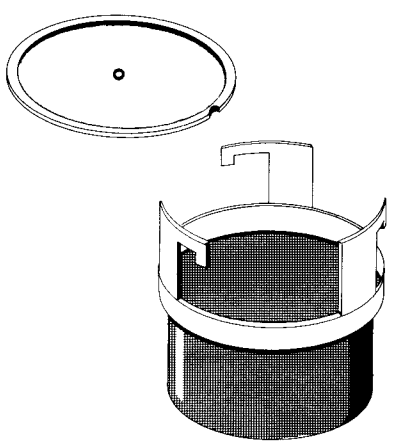


The CLOCK BASKET is the largest basket. It will hold small clock movements, such as travel clocks, etc. Since the clocks generally are of different sizes, your own judgment will indicate the best loading position.

The MULTIMOVEMENT HOLDER is what its name suggests. It consists of a partitioned section which, when placed in the Clock Basket bottom,will hold ten movements vertically. The partitioned tray is placed on top of this, and will hold six movements horizontally. Place the clock basket cover on top. Used this way, it is possible to clean up to 16 movements at once in the Multimovement Holder. When using this arrangement with L&R Duo-Lube or Solo-Lube, the watch movements are completely cleaned, rinsed, and lubricated. It is important that, after the cleaning cycle is completed, the balance wheel bridge, hairspring, and balance wheel assembly be, REMOVED from the movement and dipped in L&R Hairspring Cleaner. This treatment will remove the coating of lubricant from the hairspring and balance wheel only. This method for cleaning watch movements results in the ultimate in cleaning efficiency and economy. The Duo-Lube Lubricant will not spread or harden, and is both easy and economical to use.



The MULTIPLE INSERT BASKET set makes it possible to clean three or more disassembled watches at once. The set consists of one Insert Tray "B", one Insert Tray "C" (with two Insert Baskets "A" welded into it), and one Insert Tray "D" (with three Insert Baskets "A" welded into it). The set also includes five Baskets "A" that are loose. They may be placed into any one of the three trays, or all five may be placed in Tray "B". The complete set, one nested into the one below, is then placed into the Clock Basket and covered by the Clock Basket Solid Top.



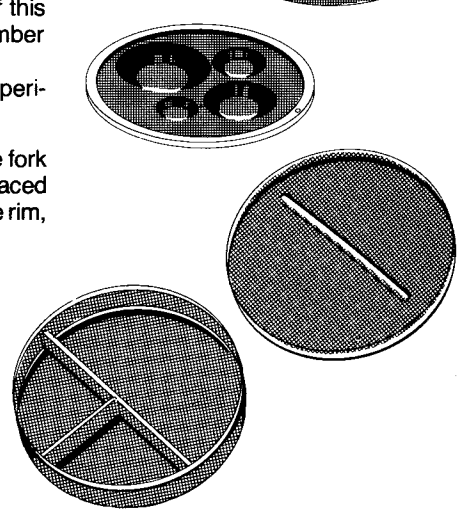
The #1 Basket set is most commonly used when cleaning one watch. If the watch is completely disassembled, the larger plates are placed in the basket itself. The various gears and wheels are placed in the tray with spherical depressions; the hairspring and pivot should be placed in the depression which best suits them. This will minimize the possibility of undue tumbling of the hairspring while in the cleaning cycle. The remaining parts — screws, etc. — are usually placed in the remaining depressions. The Basket Cover should be placed over the Basket Tray, depressed side down.

NOTE: It is advisable to make sure the basket rims are flat and meet evenly around the circumference of the basket. The complete basket is then attached to the fanwheel by bayonet action. Place the basket hooks securely over the fanwheel's three spokes. To do this, hold the fanwheel with one hand and the basket in the other, grasping the basket rim. Do not hold the basket at the mesh, since distortion may result.

The DIVIDER PARTITION Basket is used with the #1 Basket. When it is advisable to clean two watches at once, one is disassembled and the parts distributed in the various basket partitions. It is then placed into the bottom of the #1 Basket and after placing the Divider Partition Cover over this basket, the plates of the second watch are then placed on top of this cover and the smaller parts placed into the basket and covered as described above. Remember to place the hairspring and pivot in the best fitting division.

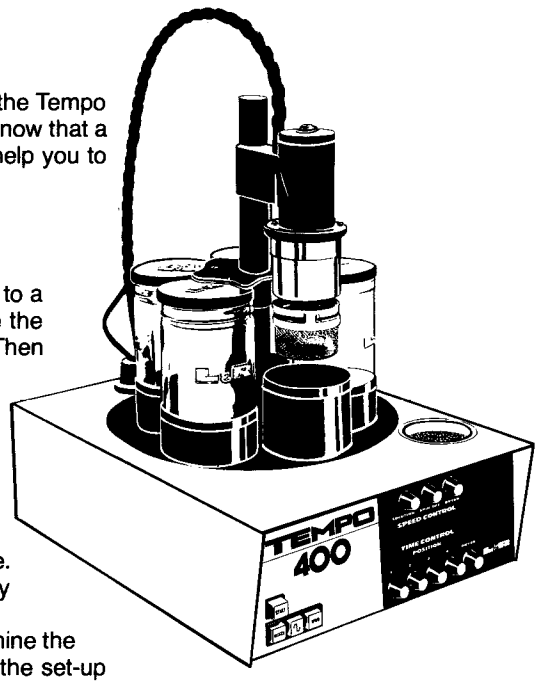
NOTE: A SOLID BASKET TOP for the #1 and Clock Baskets is supplied. Our experience has been that using these tops increases ultrasonic efficiency.

The FANWHEEL FORK facilitates mounting the Clock Basket to the fanwheel. The fork holds the fanwheel steady by engaging one of the spokes, while the basket hooks are placed onto the three studs on the fanwheel's outside diameter. Once again, hold the basket by the rim, not the mesh.



A Special Note.

The enclosed brochure describes the various L&R solutions available for use with the Tempo 400. They have been specially compounded to work best with your machine. We know that a careful study of the brochure, describing the characteristics of the solutions, will help you to decide which combination will best suit your needs.



Periodic Maintenance

For simple periodic maintenance, keep your machine lubricated. Every six months to a year, apply a light grease, such as vaseline, to the inner column and keyway. Raise the basket motor to the index position (top-most position) by use of the "Start" button. Then stop the machine by depressing the "Power" switch. To lubricate the inside of the machine, it will be necessary to remove its gold cover by removing the screws at the bottom that fasten the cover to the base and the rear cover. Place one drop of machine oil on each end of the drive bearings. Place a small amount of grease around the visible gears of the drive train, the slots of the geneva wheel, and periphery of the geneva. If the gear case noise increases above normal levels, apply grease to gear case with a grease gun, using the grease fitting located on top of the gear case. Remove any accumulated dust in the base of the machine. This will keep your machine working smoothly and help prevent problems that may occur to the mechanical system.

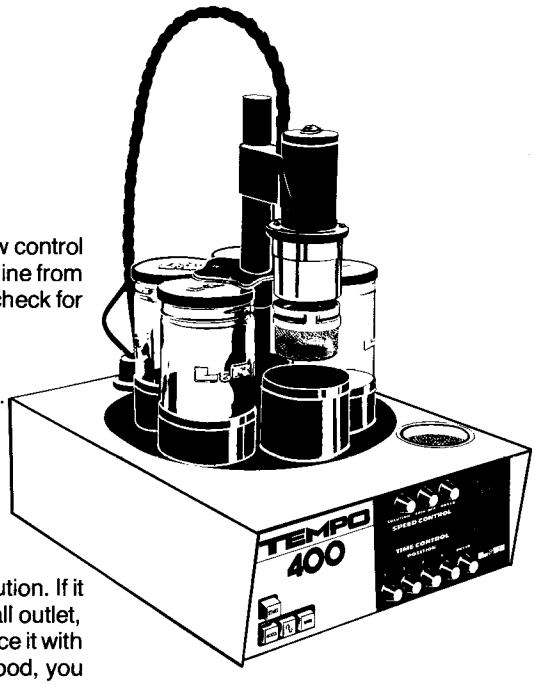
If, for any reason, the machine does not perform satisfactorily, carefully examine the line cord for proper connection to the outlet and for proper voltage. Next, review the set-up instructions and the functions of the controls. If you still cannot correct the problem, please contact the factory, or nearest repair station. Describe as well as you can the source of your problem, supplying the serial number of the machine. You have our assurance that we shall do our utmost to solve your problem as quickly as possible. Should any electrical or electronic problems occur, it is recommended that you contact the factory or authorized service station as soon as possible fully explaining the nature of the difficulty. When doing so, please supply the machine's serial number and the name of the dealer from whom it was purchased.

The Tempo 400 has been carefully designed to give years of trouble-free service. Everyone is familiar with the long trouble-free operation of solid state circuitry, such as that found in TV's, radios, calculators and even solid state watches. The Tempo 400 incorporates three solid state printed circuit boards for this purpose, interconnected by an electrical circuit.

In spite of all the care we take to insure reliability, it can happen, as it does to all appliances, that some problem or apparent failure may eventually occur. The following information is supplied to help correct any conceivable problem.

It is suggested that, should any problem occur which appears to need correction, only qualified personnel be permitted to perform the service.

IMPORTANT-If at any time it becomes necessary to remove the cover of the machine, DISCONNECT THE MACHINE FROM THE ELECTRICAL OUTLET TO WHICH IT IS CONNECTED.



Trouble Shooting

Problem: Machine is not synchronized. Motor raises and lowers too soon or too late.

Solution: Must be corrected by an authorized L&R service center or the factory.

Problem: Basket motor speeds cannot be properly adjusted.

Solution: Notify factory or repair station at once, carefully outlining the problem. A new control circuit board will be sent to you. To replace it, remove the machine's cover. Unplug machine from outlet, then remove front printed circuit board and install replacement. Run machine to check for correctness of operation. Return defective circuit board for proper credit.

Problem: Time intervals cannot be adequately adjusted.

Solution: Notify nearest repair station or factory supplying all possible information. A new printed circuit board will be sent to you. Proceed as above and check for proper operation. Return defective board for proper credit.

Problem: Basket motor starts too soon or too late.

Solution: Recommend you contact an authorized L&R service center or the factory.

Problem: No ultrasonic activity while in solution.

Solution 1: Check to see if the ultrasonic switch lights up when the basket is in the solution. If it does, proceed to remove the back cover. With the line cord disconnected from the wall outlet, check the fuse mounted on the ultrasonic printed circuit board. If the fuse is blown, replace it with the same type (AGC 2) and operate the ultrasonic to see if it works. If the fuse is good, you should place a test light across the two top terminals (¼" spade connectors) to see if there is voltage. If there is no voltage, the machine will have to be repaired at an authorized L&R Service Station. If the fuse is blown, and, after replacing it and turning the unit on, it blows again, then follow Solution 2.

Solution 2: Call factory or nearest repair station, outlining the problem carefully. A replacement transducer and printed circuit board will be sent to you for replacement. To replace board, unplug the machine from its wall receptacle and remove the machine's cover. Remove the two screws that hold the bracket to the base. Then carefully transfer each electrical connection (one at a time) from the suspected board to the new board. Remove transducer and replace with new matched one. To do this, unwind the plastic spiral winding of the motor and transducer leads. Remove the fanwheel from the motor, then remove the four screws and nuts that hold the transducer to the motor. Assemble the new transducer following the above directions in reverse. Check for proper operation. If the problem still exists, check the machine's circuit for a faulty switch or loose connection.

You must replace both the ultrasonic generator printed circuit board and transducer since they are matched at the factory. Failure to do this will result in board malfunction.

The above information will help correct a majority of the problems that may occasionally be encountered. We realize there may be times when some electrical failure may occur because of a defective switch or loose connection somewhere in the circuit. It is almost impossible to foresee every eventuality and a wiring diagram and an electrical schematic for the entire circuit (including schematics for the printed circuit boards) are supplied. Careful study and examination of these circuits will be an invaluable aid to perform this type correction.

Remember that the services of L&R trained personnel are available to you through our authorized service centers and factory service departments.

Guarantee

YOUR L&R TEMPO 400 has been carefully checked and inspected. It is guaranteed for a period of one year against factory defects in parts and workmanship. The guarantee is valid ONLY if the registration card is returned to us PROMPTLY. If the machine is damaged by unqualified personnel attempting to make corrections, the guarantee will be considered void.