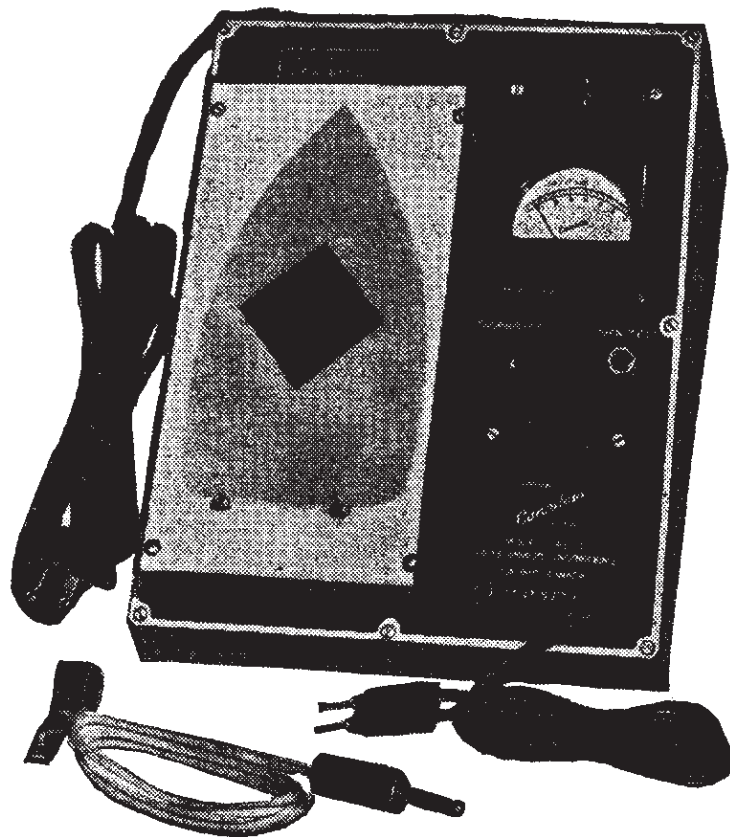


INSTRUCTION MANUAL

for

Canadian

Appliance Tester Model AT-1



MEASUREMENT ENGINEERING

**61 DUKE STREET
TORONTO, CANADA**

Canadian Model AT-1 Appliance Tester

The Canadian Model AT-1 Appliance Tester was designed to permit more efficient and thorough repairs to thermal devices. In this broad classification are included: automatic irons, toasters, ovens, roasters, percolators, coffee makers, waffle bakers, grills and hot plates. Features of the AT-1 will also be found useful in repairing other appliances.

DESCRIPTION: The instrument consists of an accurate millivolt meter connected internally to a constantan-copper thermocouple, welded to a stainless steel strip. This strip is fastened to an asbestos pad in such a manner that when the iron is placed on the pad, the meter accurately indicates the temperature of the iron sole-plate.

An external thermocouple is available (type ET-1) which consists of a small spring clip welded to a thermocouple junction. Flexible, fiber-glass insulated leads connect the thermocouple to a plug which, when inserted into the jack provided in the AT-1, permits the meter to indicate the temperature of the external thermocouple.

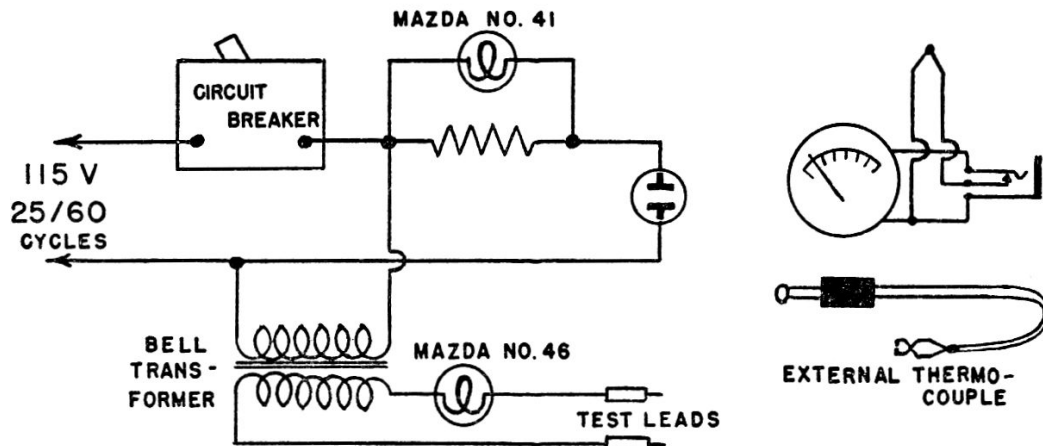


Fig. 1—Wiring diagram of Model AT-1 Appliances Tester.

Fig. 1 shows the circuit of the appliance tester and a brief description of operation will be found helpful. A receptacle is provided into which can be plugged the appliance under test. In series with this receptacle is a resistor and in parallel with the resistor a small lamp. When the appliance draws current the lamp lights up. This is useful in determining thermostat action.

Also in series with the receptacle is a magnetic circuit-breaker. Faulty and short-circuited appliances are indicated by tripping of the breaker, which is rated at 12 amps continuous. The transformer and series pilot lamp combination are very convenient for checking continuity of elements, cords, etc., and shorts from wiring to frame. Unfortunately, all pilot lamps require power to operate and the circuit is not suitable for checking continuity on resistances greater than 60 ohms (200 watts at 110 volts).

IRON HOLDER:

No special hand tools are necessary which the good service-man will not already have. However, a small holder for the workbench as illustrated in fig. 2 will be found very useful. It will prevent the iron from turning while it is being worked on and protects the base from scratches. This holder can be made simply from:

- 1 bottom—wood 1" x 5" x 9"
- 2 sides—wood 1" x 2" x 10"
- 1 front—wood 1" x 5" x 3½"
- 1 piece of felt 5" x 12"
- Nails or screws or glue as required.

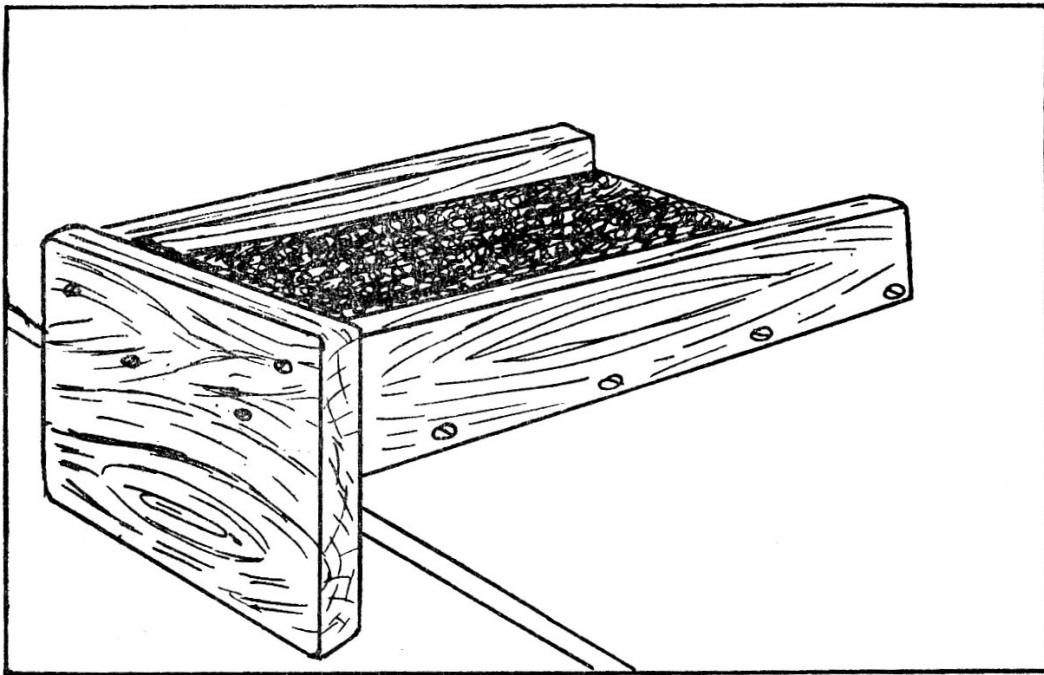


Fig. 2—Simple iron holder for bench use.

This holder can be permanently fastened to the bench if there is room or may be left loose so that it is removable. Care should be taken that the screws or nails cannot scratch the iron.

The ironing habits of different people are not the same. Some will iron extremely slow and others very fast. Some will dampen their clothes more than others. Due to these variables, you may find that an iron which gives perfect results for one person may be too hot for the slow ironer or not hot enough for the fast ironer, or for the one who dampens too much. When the user says that the iron is too hot or not hot enough, the calibration should be checked before replacing the thermostat. In many cases the temperature of the iron will be found to be all right, in which case the user should be instructed to use higher or lower settings as necessary.

AUTOMATIC IRONS:

1. The AT-1 Appliance Tester is ideal for checking iron tempera-

tures. Place the iron on the asbestos pad, nose either up or down. Plug the iron cord into the receptacle on the AT-1 and operate the circuit breaker to the "on" position.

2. Set the thermostat adjustment lever at its highest position. The pilot lamp in series with the iron will light up until the thermostat cuts out, and then will go out until the thermostat cuts in again. Allow the iron to heat for three cycles before taking readings. However, watch the meter carefully for a defective iron might overheat and damage the meter.

3. After three cycles, take a temperature reading the next time the thermostat closes (light goes on).

4. Take a second reading when the thermostat opens (light goes out).

5. Compute the average temperature, by adding the two readings and dividing by two. Example—the cut-on temperature was 530° and cut-off 580° . 530° plus 580° is 1110° . 1110° divided by two is 555° or the average temperature.

6. The differential is the difference between the two readings. Example— $580^{\circ}-530^{\circ}$ is 50° , the differential.

7. Compare the average and differential found with the limits given in the table supplied for the iron under test. If within the limits the iron is O.K. If outside, replace the thermostat.

In any heating appliance, heat is developed by the element and conducted away from the element to do some useful purpose. One of the life factors of the element is how thoroughly the heat is conducted away. If the heat is not conducted away the temperature of the element wire will rise beyond all permissible limits and early failure can be expected. If the heat is not conducted away uniformly from the element wire there will be comparatively hot and cool spots. This will cause unequal expansion of various parts of the element and eventually result in a mechanical break. There should always be an intimate and uniform thermal contact between an iron element and the sole-plate. An iron which has given repeated trouble should be checked to see that the parts are smooth and level before wasting more elements. The thickness gauge or feeler is very useful. The same principle applies to almost all heating appliances.

Detailed instructions for replacing such parts as handles, elements, cords, etc. vary so extensively with different makes of appliances that it would not be practical to include them in this booklet. However, common sense is the main requisite, and the worker who is intent on doing a thorough job will run into no difficulties. Even the smallest appliance repair offer an opportunity to build good will and a satisfied customer. A study of the general notes at the back of this booklet will help.

One point to remember is that an iron brought in with a burned-out element may also require thermostat replacement. The converse

is also true, for a defective thermostat can overload and burn out or weaken the element.

Roaster ovens, stove ovens, percolators, waffle bakers and grills can best be checked with the ET-1 external thermocouple. It should be plugged into the jack on the appliance tester and can be clipped onto oven racks or placed between the top and bottom section of a grill or waffle baker. It can be inserted in water in a percolator with no harmful effects. Readings taken for average and differential should be compared with those obtainable from the appliance manufacturer and decision can be made whether or not the appliance is defective. Generally speaking, appliances are almost trouble-free and when repaired with good equipment and exact replacement parts, there is no reason why they cannot be guaranteed.

GENERAL SUGGESTIONS:

A few general suggestions may be helpful in doing a thorough job.

(1) Check extension cords for good connections and good insulation. It isn't difficult to convince a customer that poor insulation endangers the life of members of her family.

(2) Clean terminals with file or sandpaper removing rough spots and pits.

(3) Clean the scratch marks off the cover and sole-plate of the electric iron, the burned toast marks off the toaster, the discoloration caused by waffle batter when it cooks over, the coffee stains on percolator.

When a customer gets back a dirty appliance, she wonders whether or not anything has been done to it. When it is cleaned and polished like new, she is quite likely to feel that a complete repair job has been done. First thing you know, she'll be telling Mrs. Neighbour over the garden fence, and Mrs. Neighbour will remember that her iron or toaster has been giving trouble lately.

To polish chrome-plated appliances, use a chrome buffing compound on a buffer. Then wipe off and polish the appliance with a soft flannel-like cloth. The chrome polishing compound will take burns and scratch marks off the iron, but it will not completely take off burned waffle batter and food marks from the chrome-plated parts of waffle irons and sandwich grills. Some of these marks can be removed by buffing, but if you try to buff it all off, you may take off some of the chrome finish too.

To remove these marks completely, take the appliance apart and dip the chrome-finished part (except the grids of waffle irons) in a hot alkaline cleaner solution. Such a solution can be made by mixing two or three ounces of Oakite to a gallon of water. Bring the solution to a boil and leave the part in it for 8 to 10 hours. If Oakite is not available, a similar solution can be made with two ounces of sal

soda and one ounce of granulated laundry soap to a gallon of water. Keep the solution hot and give it time to work on the burned food stains. Don't expect to dip the part for a few minutes and see wonders work.

CAUTION: Do not put elements or grids in this solution. If grids are blackened, the only cure is sandblasting. There are sandblasting facilities in almost every locality. For the best cleaning job, a fine sandblast should be used.

Good will can be built by cleaning appliances after they are repaired. The owner tells her friends, "I took it in to be repaired and it came back looking like new." Such talk about a repairman's work builds good will and repeat business for him.

MAINTENANCE:

A few suggestions regarding maintaining your Model AT-1 Appliance Tester. Normally, with exception of replacing the pilot lamps, no repairs are necessary. The transformer should deliver 6 to 8 volts. Use a Mazda No. 40 (6v) lamp in the continuity circuit. A Mazda No. 41 (2.5v) is supplied in the thermostat circuit. When checking appliances drawing less than 550 watts, a smaller bulb such as a 1.5 volt flashlight bulb will give better thermostat indication, but it would quickly burn out if used on 1000 watt appliances. When the instrument is not in use the meter should read room temperature and can be set by means of the screw driver adjustment on the front, in comparison with a good room thermometer.

At the top of the scale, the instrument is difficult to check without a standard thermocouple meter. It may be recalibrated in our plant at any time for a nominal charge.

Much of the material presented here is available to us through the courtesy of Westinghouse Electric Corporation, Mansfield.

TEST DATA FOR AUTOMATIC IRONS:

(This data was furnished by the manufacturer's service department. Several manufacturers had not furnished data in time for printing but the information below will serve as a guide for use on other makes of irons).

Canadian General Electric: "The following table will serve as a guide to setting irons to suit the average user: Silk (rayon), 225°-275°F; Wool, 275°-325°F; Cotton, 325°-375°F; Linen, 375°-425°F. Rayon should not be ironed at more than 300°F in any case."

Canadian Westinghouse Co.

Model No.		Maximum Temp.	Temp. Differential
L.A.4		520-570°F.	50-100°F.
*36620 }	1st series	540-600°F.	50°F.
36625 }	2nd series	525-560°F.	25°F.
LKC-4(4A)		535-585°F.	90-120°F.
LB4, LB4A, HB		500-550°F.	

*First series (max. temperatures)—rayon, 300°F; Silk, 325°F.; wool, 350°F.; cotton, 480°F.; linen, 550°F.

Second series (max. temperatures)—rayon, 250°F.; silk, 300°F.; wool, 350°F.; cotton, 450°F.; linen, 550°F.

Sunbeam Corporation (Canada) Ltd., recommend that all their appliances be returned to the factory for repairs or adjustment.

U.S. Manufacturers generally conform to N.E.M.A. Standard DA4-42 condensed as follows. Stabilized temperature at lowest thermostat setting, 350° (max.). Stabilized temperature at highest thermostat setting, 450° (min.).

Cyclic fluctuation shall not exceed 100°F. Maximum temperature at highest thermostat setting 600°F. Cyclic frequency shall not be greater than one per minute, and there shall be no thermostat "fluttering".