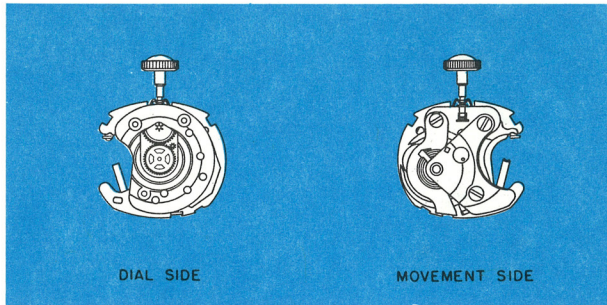


TIMEX model 69

SERVICE MANUAL
MODEL 69

6³/₄ by 8 lig.
15.4 by 18.0 mm
.605 by .706 in.

the TIMEX model 69 Movement



The Timex Model 69 is a $6\frac{3}{4} \times 8$ ligne electric watch movement. The power to drive the movement is supplied by a miniature energy cell. Power from the energy cell drives the balance. The balance drives the time train which, in turn, rotates the hands.

The energy cell is guaranteed for 12 months and replacement cells are available from your local Timex dealer, repair station or the Timex Material Sales Division.

Other types, although they look the same, may not deliver the necessary voltage or life and, in addition, may leak, seriously damaging the movement.

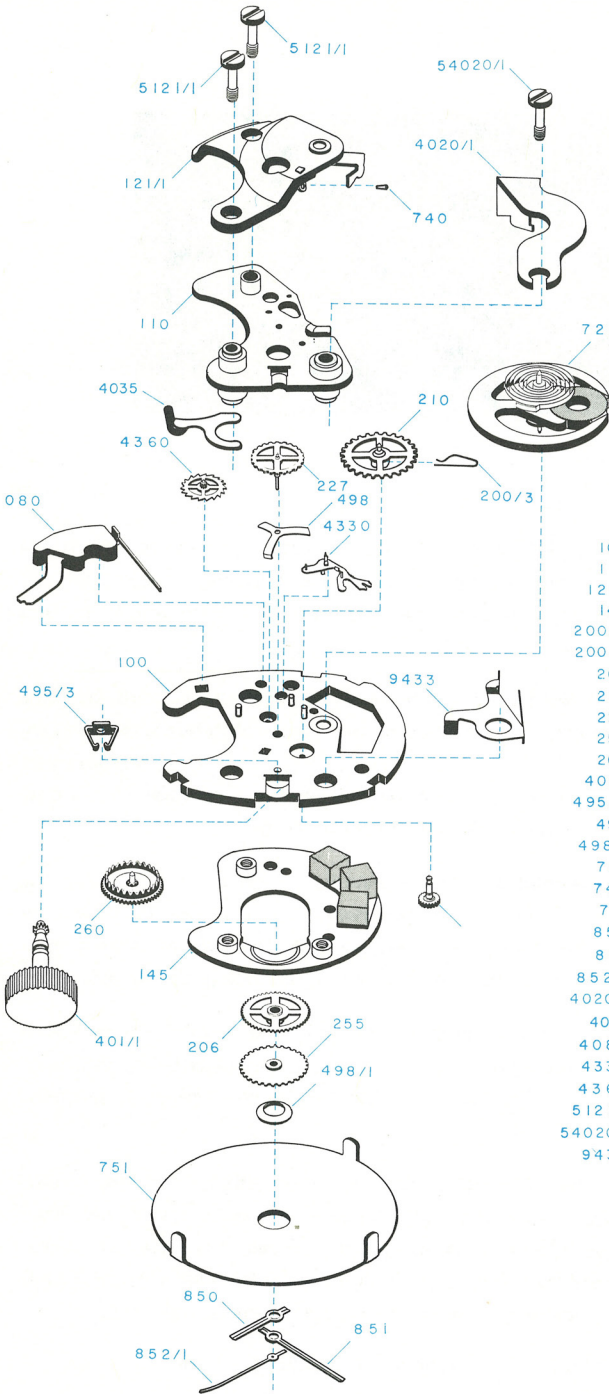
The hands are set in the normal method — that is, pulling out and rotating the crown. The Model 69 incorporates a device which stops the balance oscillation when the crown is in the set position. In this position, the flow of current from the energy cell is interrupted and the energy cell is not being discharged.

The Timex electric has an hourly beat of 21,600. The large balance has a temperature compensated hairspring and the rate can be adjusted in the usual way by moving the regulator. The Timex electric can be checked in all positions on a normal watch rate recorder.

The Timex electric can be dismantled and repaired with conventional tools. There is no need for special knowledge of electricity or electronics, or any need for complicated electrical measuring or inspection devices, new tools or microscopes. For checking the energy cell voltage, a high ohm volt meter (about 20,000 ohms per volt), which is now in use in most repair stations, is sufficient.

Since watch contains permanent magnets, no attempt should be made to demagnetize the watch.

the TIMEX model 69 movement (exploded view)



- 100 PLATE ASS'Y.
- 110 TRAIN WHEEL BRIDGE ASS'Y.
- 121/1 BALANCE BRIDGE ASS'Y.
- 145 DIAL REST
- 200/2 FRICTION PINION
- 200/3 FRICTION SPRING
- 206 CENTER WHEEL ASS'Y.
- 210 THIRD WHEEL ASS'Y.
- 227 SECONDS WHEEL ASS'Y.
- 255 HOUR WHEEL ASS'Y.
- 260 MINUTE WHEEL ASS'Y.
- 401/1 SETTING STEM WITH CROWN
- 495/3 STEM BRACKET
- 498 FRICTION WASHER
- 498/1 HOUR WHEEL WASHER
- 721 BALANCE ASS'Y.
- 740 HAIRSPRING WEDGE PIN DIAL
- 751 DIAL
- 850 HOUR HAND
- 851 MINUTE HAND
- 852/1 SWEEP SECOND HAND
- 4020/1 SHUNT BRIDGE
- 4035 ENERGY CELL SPRING
- 4080 CONTACT SPRING ASS'Y.
- 4330 INDEX LEVER ASS'Y.
- 4360 INDEX WHEEL ASS'Y.
- 5121/1 BALANCE BRIDGE SCREW
- 54020/1 SHUNT BRIDGE SCREW
- 9433 SET SPRING

Removing and Replacing the Energy Cell

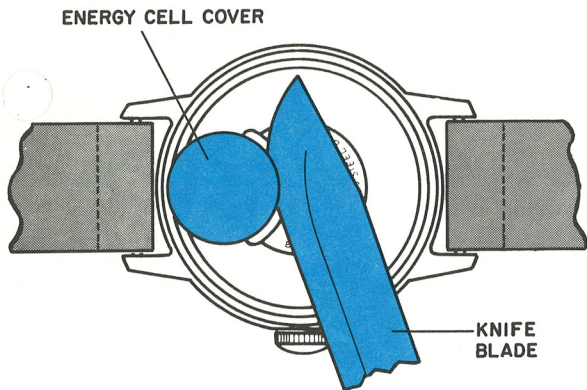


ILLUSTRATION NO. 1

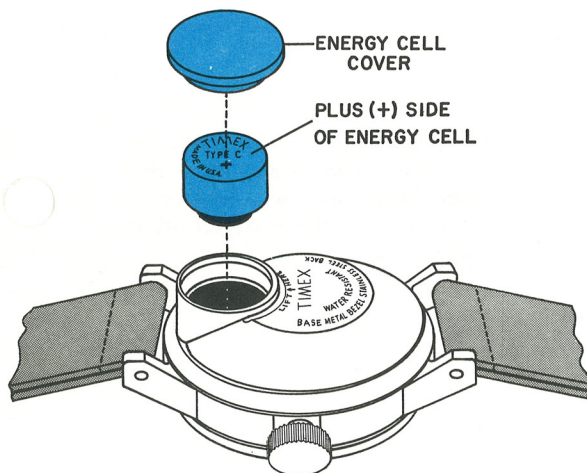
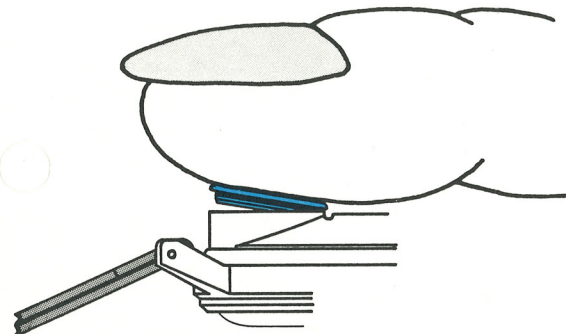


ILLUSTRATION NO. 2



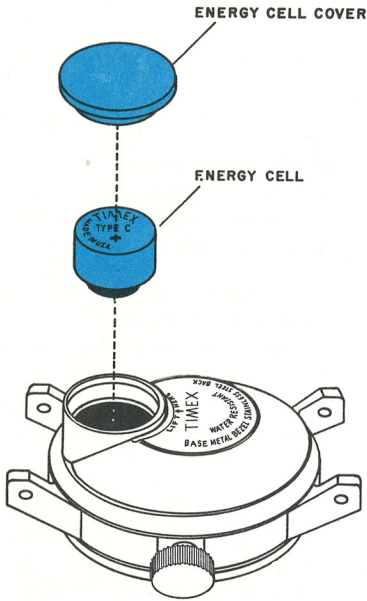
The first step in uncasing the movement is to remove the energy cell.

To remove or replace the energy cell, use following procedure:

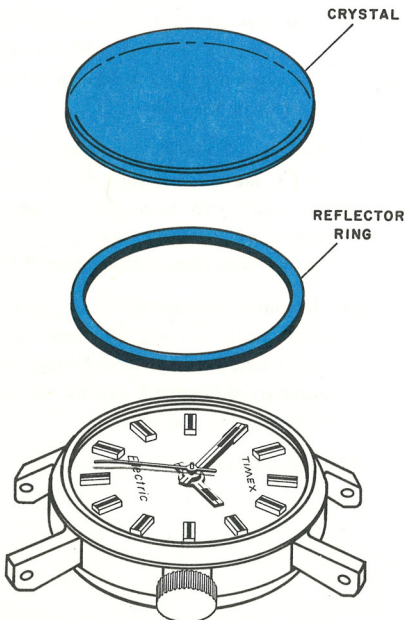
- 1) The energy cell cover is a flat circular piece located on the back of the watch. To remove the cover, insert a knife blade under the lip of the cover as indicated by the words "Lift Here" stamped on the caseback and carefully pry off cover.
- 2) Turn the watch right side up, the energy cell will fall out, check the voltage of the energy cell. Any cell with a voltage of less than 1.30 volts (check with a meter with a sensitivity of at least 20,000 ohms per volt) or one which has been in service in excess of one year should be replaced.*
- 3) Insert new energy cell (Illustration #2). Be certain that the side with the name Timex and the plus (+) symbol is facing the energy cell cover.
- 4) Replace the energy cell cover by leading in the edge toward the center of the watch and then pressing on the outside edge until the energy cell cover "snaps" into place. (Illustration #3).
- 5) The instant the cover is "snapped" in place, electrical contact is made. If the watch does not start immediately, slight agitation of the watch may be necessary to restart the mechanism.

*Do not dispose of cell in fire.

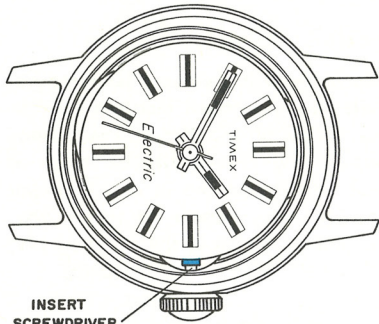
Disassembly of Movement (model 69)



After the energy cell has been removed, the crystal and reflector ring may be disassembled. Use a Timex crystal lift or conventional crystal lift to remove the crystal.



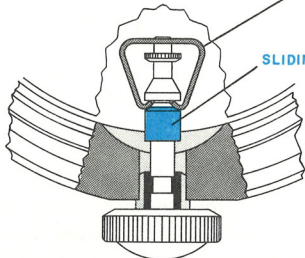
Disassembly of Movement Cont'd



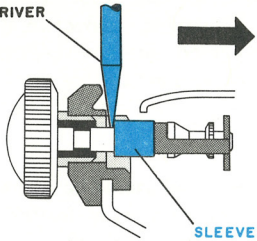
INSERT
SCREWDRIVER
HERE

STEM BRACKET
495/3

SLIDING SLEEVE

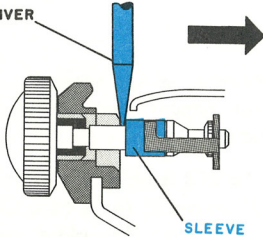


SCREWDRIVER

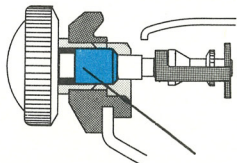


SLEEVE

SCREWDRIVER



SLEEVE



Since the only function of the stem on the Model 69 is to stop the movement and set the hands, the stem retention has been simplified by combining the stem and setting pinion and providing a novel stem bracket (495/3).

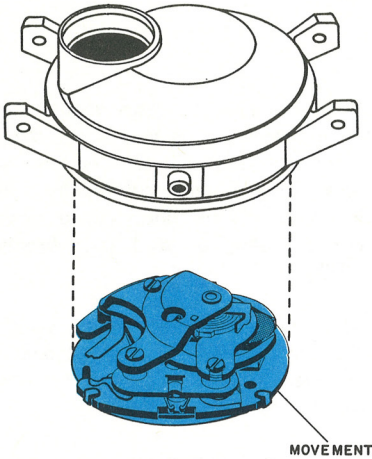
There are no screws or levers holding the stem. Instead, a sliding sleeve on the stem is used to release the stem bracket from the stem.

First, pull the stem into set position. Then insert a screwdriver behind the sliding sleeve and push the sleeve in toward the center of the watch while holding the movement in place. Caution — avoid damaging the crystal seat with the screwdriver blade. When the sleeve is pushed in, the stem will return to the normal running position and the sleeve will have spread the ears of the stem bracket. The stem may now be removed by gently pulling out and turning the crown. It is important to hold the movement in place while removing the stem.

Since the sleeve is free on the stem, it may have slid into the pendant. In this case, it will be necessary to slide the sleeve into position by means of tweezers so that the screwdriver will fit behind the sleeve.

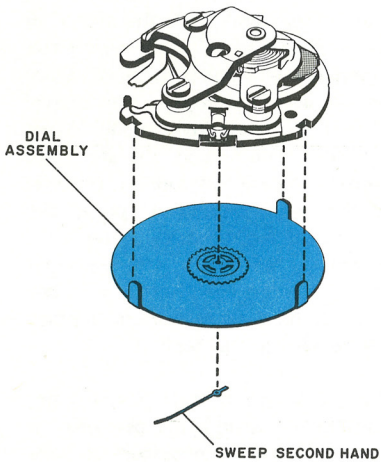
To replace the stem, hold the movement in place and firmly press the stem into place with a slight rotating motion so that the stem pinion teeth will mesh with the minute wheel teeth.

Disassembly of Movement Cont'd.



The movement may now be removed. Note, the movement locating tabs on the inside of the bezel, when reinserting the movement, be cautious that the movement is in its proper position with respect to these locating tabs, otherwise, the reflector ring and crystal will not seat properly.

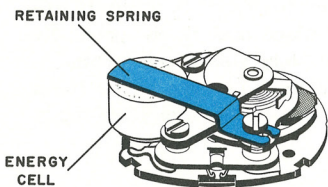
To examine the function of the movement, replace the stem and place the movement on a suitable movement ring and clamp the energy cell in place with an energy cell retaining spring. (This spring is available upon request from a Timex Material Sales Division.)



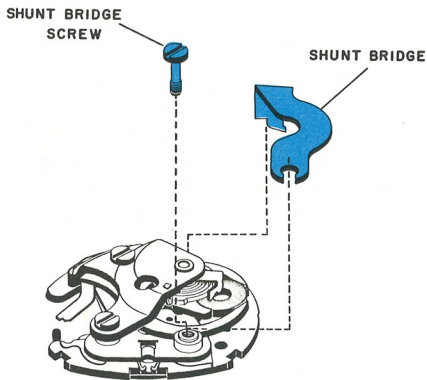
The negative pole of the energy cell must touch the contact spring assembly (No. 4080 on exploded view). The positive pole of the energy cell is grounded to the movement. Never cause a metallic connection between the insulated and uninsulated parts of the movement as this short circuit could shorten the life of the energy cell.

The energy cell should be removed before proceeding with further disassembly of the movement.

- a) Remove sweep second hand. Do not remove the minute or hour hand.
- b) The dial is held on the movement by means of three tabs which are bent onto the plate assembly. Bend tabs to release dial assembly from movement.



Disassembly of Movement Cont'd.

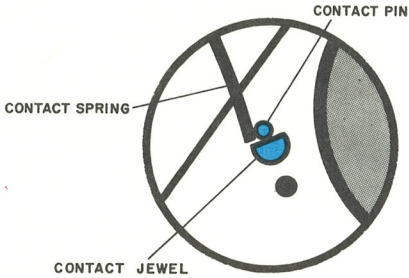


Rotate the balance wheel to lock position before removing the shunt. This will avoid damage to the coil.

Remove the shunt bridge screw and carefully lift the screw end of the shunt bridge from its post. The opposite end of the shunt bridge is held in place by a tab overlapping the plate. Gently push the shunt in this direction until the end of the shunt is unhooked from the plate.

This operation should be carefully carried out so as not to disturb the hair-spring or balance. After the shunt bridge has been removed, the shunt bridge screw should be put back into place and tightened.

Disassembly of Movement Cont'd.



To observe the action of the contact spring and balance, use the following procedures:

Rotate the balance slowly from its rest position with a clean brush. (See figure 1.) The instant the contact spring touches the contact pin fixed on the balance, current flows through the balance drive coil. The current induces a magnetic field which opposes the field of the magnet. This opposition of magnetic fields imparts an impulse to the balance.

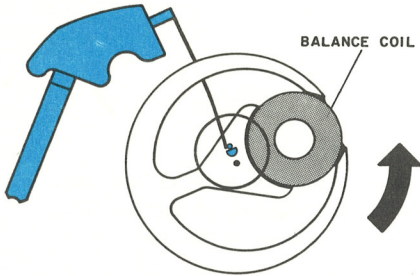


FIGURE 1

The purpose of the contact jewel is to limit the physical contact between the contact pin and contact spring so that the flow of electrical energy occurs at a precise position during the rotation of the balance.

After the balance returns to its neutral position, the same process is repeated in the opposite direction. (See figure 2.) Repeat this test several times until the drive action is fully understood. The function of the remainder of the movement is fully mechanical.

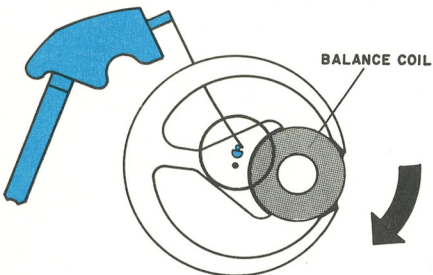
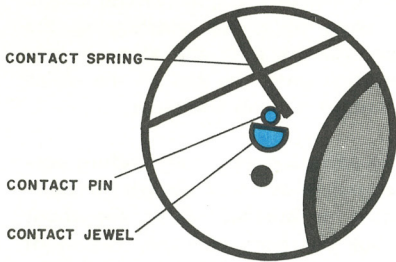
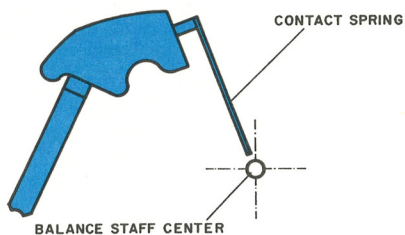
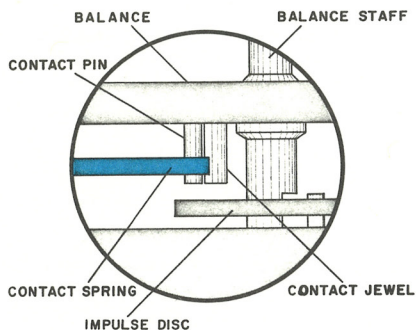


FIGURE 2

Disassembly of Movement Cont'd.



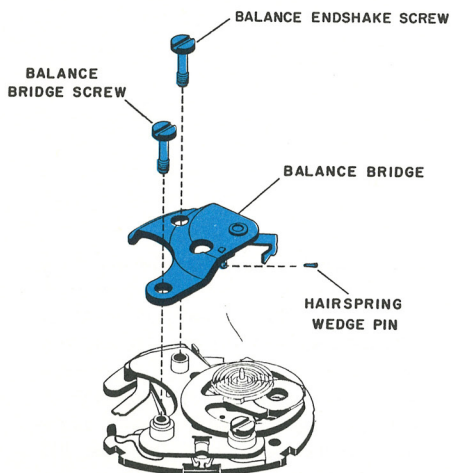
The contact spring must be pointing exactly to the center of the balance staff. It should be centered horizontally between the impulse disc and the balance. The contact spring requires very careful treatment. Protect it from scratches and deforming and avoid excessive bending while adjusting. Do not touch the contact area at the end of the spring. Do no rubbing, grinding, polishing, etc., in this area. In short, handle it with the same care as is used in handling a hair-spring.



The contact pin, contact jewel and contact spring must NOT be oiled. The presence of oil on these parts would interrupt the flow of current to the drive coil.

The length of the contact spring is fixed at the factory. No attempt should be made to adjust this length.

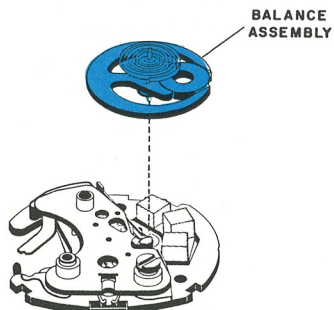
Disassembly of Movement Cont'd.



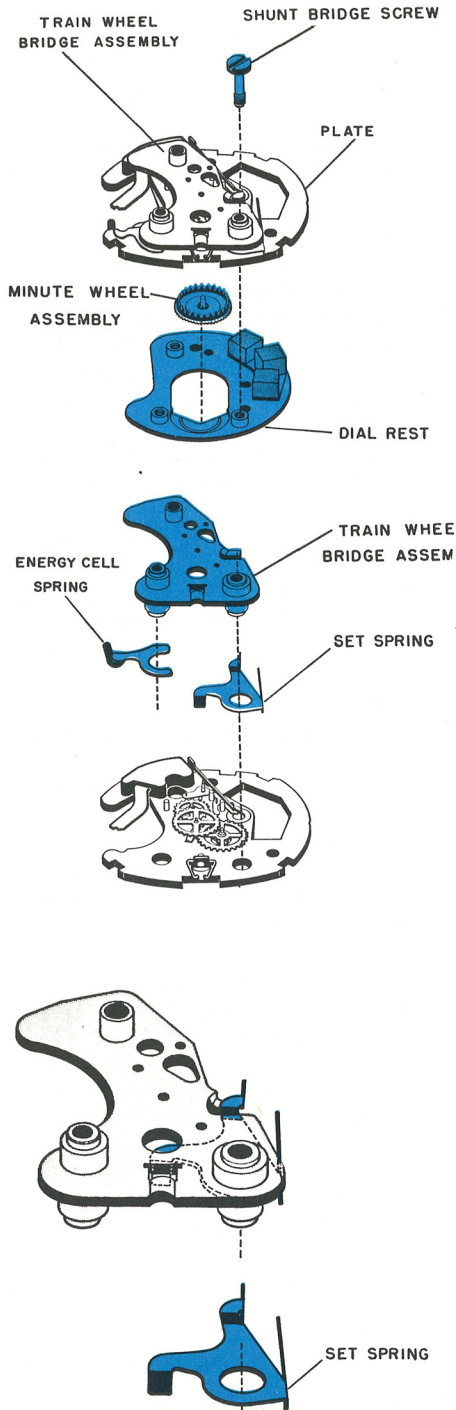
Unpin the hairspring and release it from the regulator. Next, remove the balance endshake screw and then the balance bridge screw. Next, remove balance bridge assembly.

(Note: Be certain that the shunt bridge screw is in place before removal of the balance bridge otherwise the train wheel bridge will be disturbed.)

The balance may now be removed.



Disassembly of Movement Cont'd.



Remove the shunt bridge screw, while holding the train wheel bridge and plate together.

Keep these two parts together while removing the dial rest and minute wheel assembly (this method will keep the gear train parts from being attracted to the magnet when the train wheel bridge is removed).

Next, place the movement in a suitable holder and carefully remove the train wheel bridge.

Note to the position of the set spring. The hole in the spring fits over one of the train wheel bridge pillars and the end of the spring toward the balance fits over a tab on the train wheel bridge.

Disassembly of Movement Cont'd.

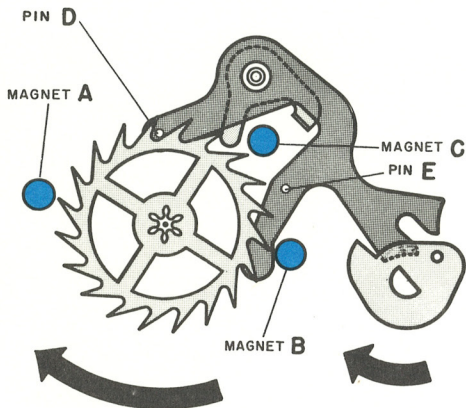


FIGURE 1

The action of the gear train is as follows:

Figure 1

The impulse pin on the balance, when moving clockwise, engages with the fork on the lever and moves the lever counterclockwise. The pin "D" on the lever, engages with the index wheel and moves the index wheel forward approximately $\frac{3}{4}$ of one tooth. The magnets (A, B and C) attract the tips of the index wheel teeth and move the wheel forward the remaining $\frac{1}{4}$ tooth. The magnet (C) also attracts the draw lever on the index lever and holds the index lever in place. Magnet (B) also acts as a banking pin for the lever.

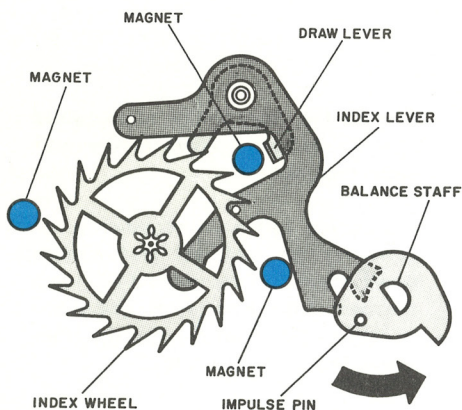


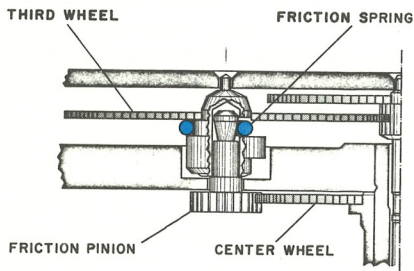
FIGURE 2

Figure 2

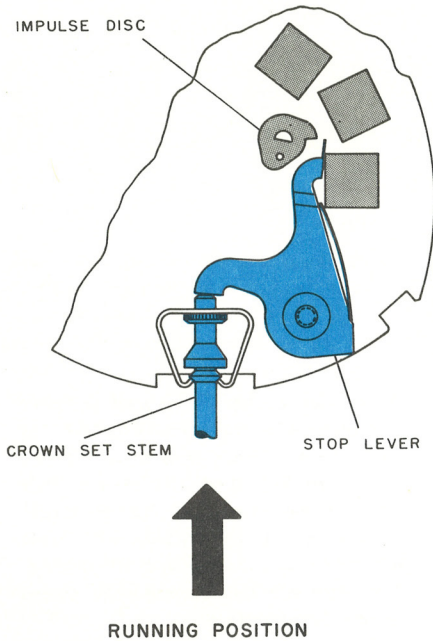
If, for any reason, the index wheel is not positioned correctly by the magnets, pin "E" on the lever turns the index wheel to its correct position so that the next engagement of pin "D" (actuated by a clockwise rotation of the balance) will advance the index wheel correctly.

Setting friction for the dial train is provided by a spring connecting the friction pinion and the third wheel. The third wheel and friction pinion may be separated by lifting the friction pinion with tweezers.

This will unsnap the friction pinion from the friction spring.

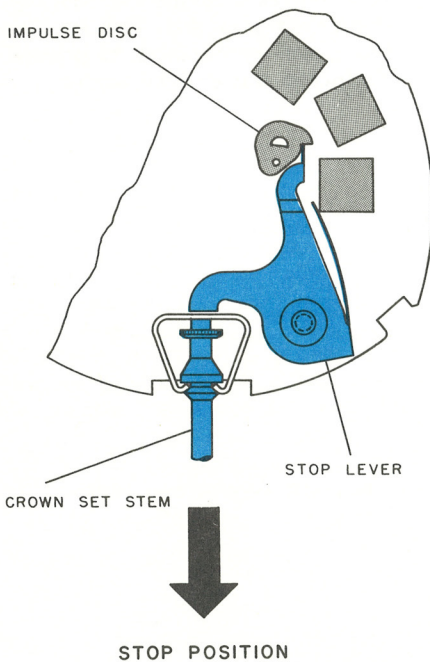


Disassembly of Movement Cont'd.



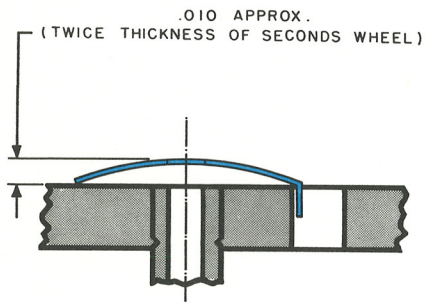
The balance stop mechanism is purely mechanical.

In the running position, the tip of the stem butts against the stop lever and keeps the tip of the stop lever away from the balance impulse disc.



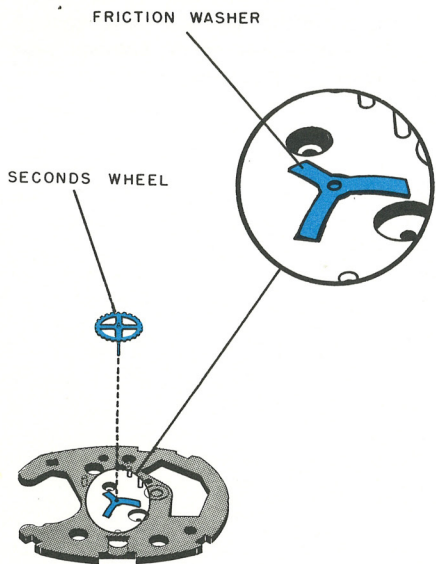
In the stop position (when the stem is pulled out into the set position), the tip of the stop lever butts against the impulse disc on the balance, thus stopping the balance.

Disassembly of Movement Cont'd.



A friction washer is located between the plate and the seconds wheel. As shown, the washer is domed slightly. Check to see that the washer has not become damaged during disassembly. Too much friction will cause too great a drag on the movement. Too little will cause an erratic sweep second hand action.

A tab has been provided on one leg of the friction washer. This tab fits into a slot on the plate to prevent the friction washer from turning.



Cleaning and Lubricating The Timex Electric

Cleaning the Model 69 Movement

Timex has found, after careful investigation, that the best way to clean the movement is to disassemble the movement only to the point of removing the balance bridge and the balance.

The balance should be cleaned separately in a small jar to avoid damage to the coil. The coil is composed of ultra-fine copper wire and should not be handled with tweezers or other sharp instruments.

Only standard watch cleaning solutions should be used throughout. Particles adhering to the magnets can be removed with Scotch tape.

Lubricating the Model 69 Movement

The movement should be re-lubricated in the normal manner using only hi-grade watch oils (oils used in factory assembly is Elgin M56 b). The balance bearings should be filled $\frac{1}{2}$ full before inserting the balance.

Other lubricating points are:

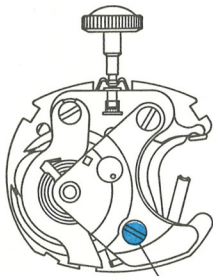
- 1 Impulse pin or fork slot
- 2 Index lever pivots
- 3 Index wheel teeth
- 4 All wheel pivots
- 5 The junction of the center wheel pinion and friction washer
- 6 The junction between the minute wheel and dial rest

Apply grease (PML type) to the stem where it is held by the stem bracket.

Do not lubricate contact spring or contact pin on the balance.

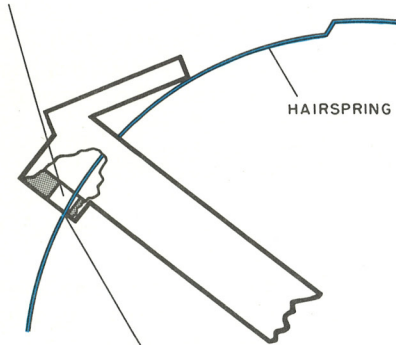
Do not use oil or greases containing silicone.

Reassembly of Movement (model 69)



BALANCE END SHAKE
ADJUSTING SCREW

REGULATOR SLOT

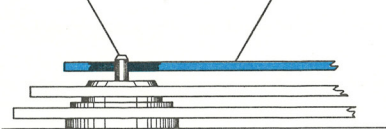


HAIRSPRING

LIGHT PERMANENT CONTACT

SWEEP SECOND STAFF

SWEEP SECOND HAND



If the movement is taken fully apart, the correct order of train assembly is:

- 1 Third Wheel*
- 2 Friction Washer
- 3 Index Lever
- 4 Index Wheel
- 5 Seconds Wheel
- 6 Stem Bracket
- 7 Stop Lever
- 8 Contact Spring
- 9 Train Wheel Bridge

*The third wheel and friction pinion should be replaced in the following manner: First, place the friction pinion (pinion side down) on a flat anvil — next, place the movement plate over the friction pinion — finally, snap the third wheel, together with friction spring, over the post of the friction pinion. This method will avoid damage to the hole in the movement plate. (See illustration on Page 69. 12).

Balance Endshake

The balance bridge screw on the 9 o'clock side serves to adjust the balance endshake. Tightening this screw will reduce the balance endshake. Use caution while adjusting the endshake to avoid damage to the points of the balance staff.

Inspect the hairspring to be certain that it is properly adjusted. As shown, the hairspring should be in light permanent contact with the inside edge of the regulator slot. The hairspring is held in this position by a tab extending from the regulator.

When replacing the dial assembly, pre-position the hands to 12:00 before inserting the tabs on the dial into the plate. Bend tabs to secure dial. Replace the sweep second hand by driving it just below the end of the sweep second staff as shown in the diagram. Be certain the sweep hand is set below the chamfer on the top of the staff.