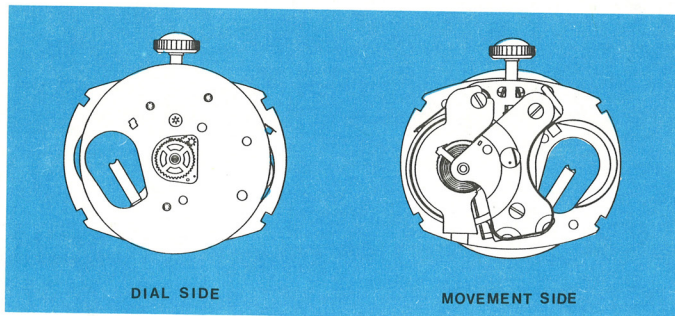


TIMEX model 253

DYNABEAT
Electric Watch

9 $\frac{3}{4}$ by 12 $\frac{3}{4}$ lig.
22.1 by 28.7 mm
.870 by 1.130 in.

The TIMEX® Model 253 Movement



ACTUAL SIZE

The Timex Model 253 is a $9\frac{3}{4} \times 12\frac{3}{4}$ Ligne electric watch movement featuring a high frequency balance system.

The Model 253 is powered by a Timex energy cell Type A. We recommend replacement only with genuine Timex energy cell Type A. Use of energy cell not meeting Timex specifications may cause your Timex watch to malfunction.

The Timex Model 253 operates at a rate of 28,800 beats per hour. The rate can be checked on all conventional watch rate recorders having a setting for 28,800 beats per hour. The rate may also be checked on some recorders using a setting for 14,400 or 21,600 beats per hour.

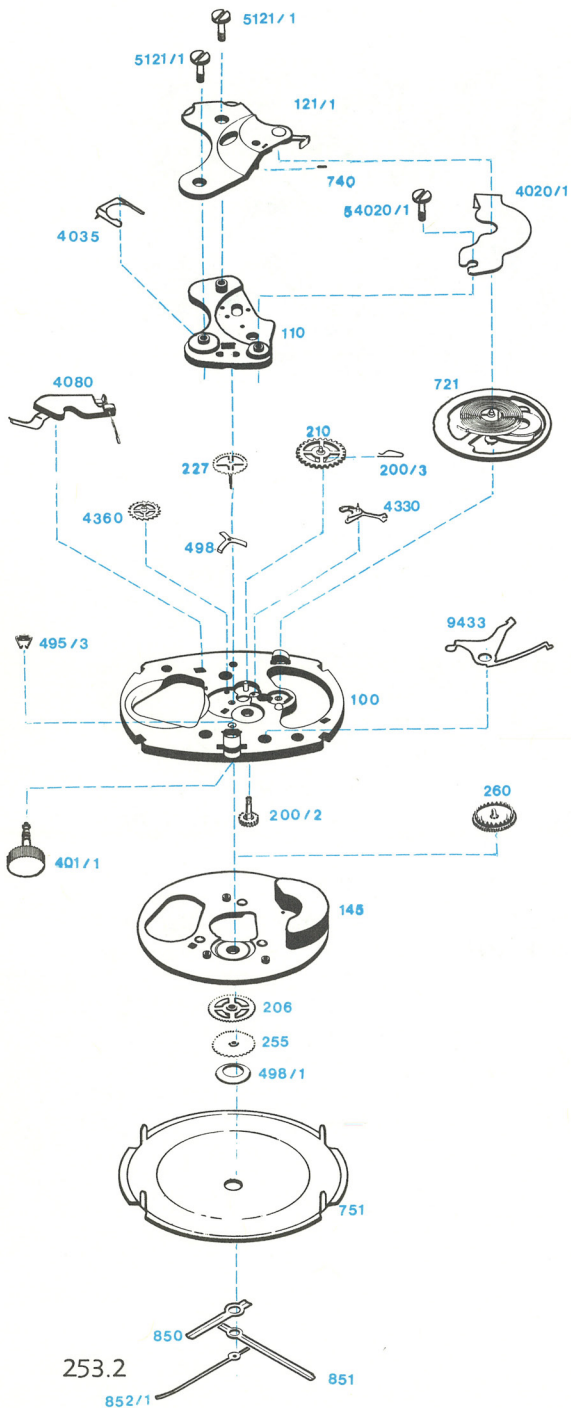
In the Model 253, the contact spring assembly, seconds wheel assembly, index wheel assembly and balance wheel assembly are different from similar Timex Model 40 and Timex Model 50 parts.

The Timex code number appears on the edge of the dial.

The code number shows the catalog number, movement number, and year of manufacture for the watch (see Page 1.1 of the Timex Service Manual for explanation).

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

The **TIMEX**® Model 253 Movement (exploded view)



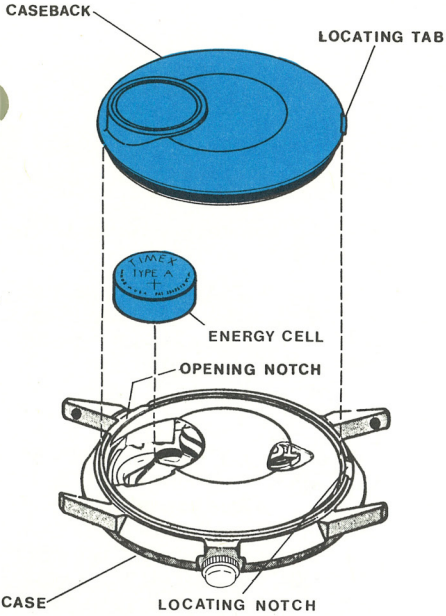
- 100 PLATE ASS'Y.
- 110 TRAIN WHEEL BRIDGE ASS'Y.
- 121/1 BALANCE BRIDGE ASS'Y.
- 145 DIAL REST
- 200/2 FRICTION PINION
- 200/3 FRICTION SPRING
- 206 CENTER WHEEL ASS'Y.
- 210 THIRD WHEEL ASS'Y.
- 227 SECONDS WHEEL ASS'Y.
- 255 HOUR WHEEL ASS'Y.
- 260 MINUTE WHEEL ASS'Y.
- 401/1 SETTING STEM WITH CROWN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

253.2

852/1

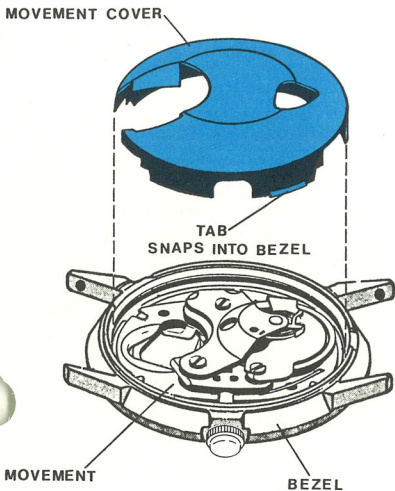
851

Disassembly of the Model 253 Movement



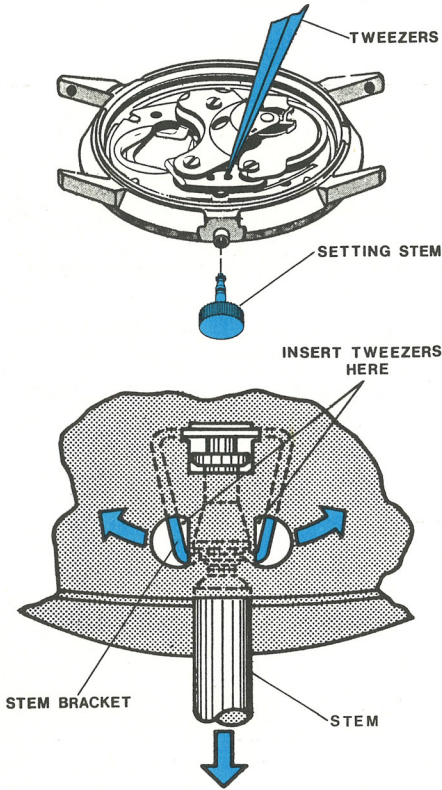
Insert blade into the opening on the bezel and pry the caseback off as shown at left. (The locating tab on the caseback is used for orientation of the back during re-assembly.)

Remove the energy cell (energy cell with a voltage of less than 1.5 volts or in service in excess of one year should be replaced).



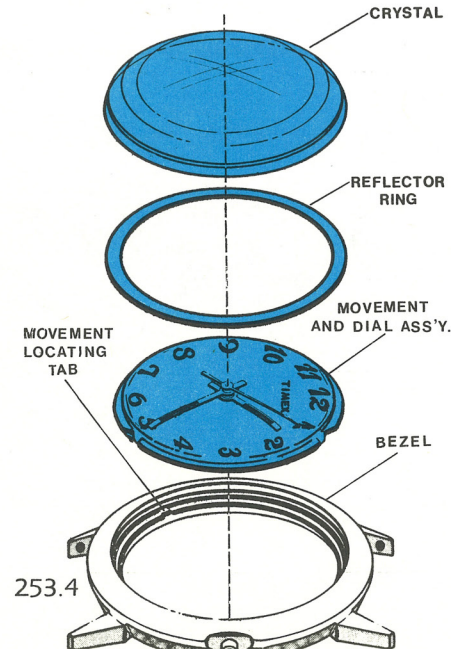
Lift off the movement cover as shown at left. The cover is held in place by two tabs which snap into recesses in the bezel.

Disassembly of the Model 253 Movement



Remove the setting stem with crown:

The stem is held in position by the stem bracket (see illustrations at left). To remove the stem, pull the stem out into the set position and continue to maintain a slight outward pull. Place the points of a heavy tweezers into one side of the stem bracket and push bracket aside to release one side of stem. Continue to pull the stem outward and use the points of the tweezers to release the other side of the stem from the bracket. The stem will now pull free of the movement and bezel.



To remove movement:

After the stem is removed, the movement can be removed through the crystal side of the bezel. Remove the crystal with a crystal seating tool and then lift the reflector ring and movement free of the bezel (note the position of the movement locating tabs inside the bezel. Tabs should properly align in notches of the plate when re-assembling the watch.)

Disassembly of the Model 253 Movement

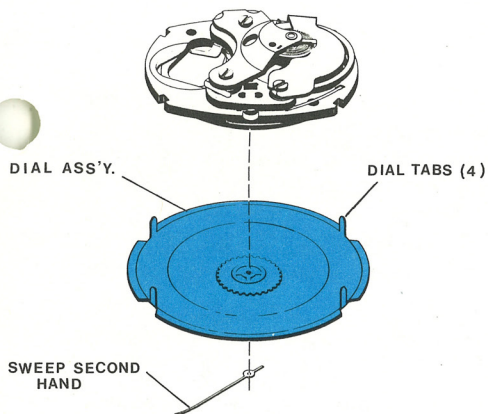


FIGURE A

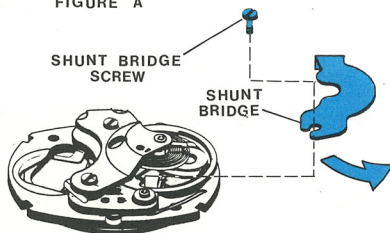


FIGURE B

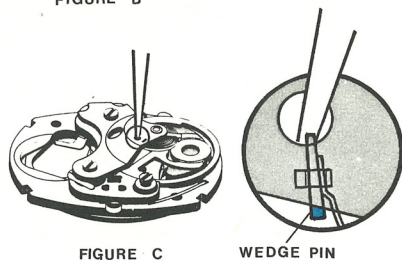


FIGURE C

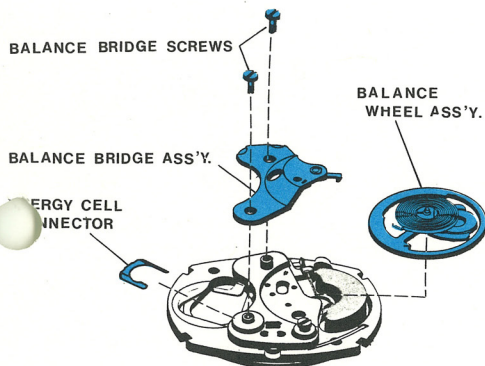


FIGURE D

See Figure A
Remove sweep second hand.
(Minute and hour hands need not be removed)

Straighten four (4) dial tabs enough to remove the dial from the movement.

See Figure B

Remove shunt bridge screw.

Lift screw end of shunt bridge off post and carefully slide shunt bridge from movement (note Tab on end of shunt bridge which engages the plate).

Replace shunt bridge screw.

See Figure C and Figure D

1. Remove the hairspring wedge pin, do not distort either the pin or the hairspring. Note hole in the balance bridge which permits access to the wedge pin.*
2. Rotate the balance wheel carefully until the hairspring tail is free of the hairspring bracket and the regulator.*
3. Note position of energy cell connector then remove the two balance screws, remove connector, lift off the balance bridge assembly and carefully remove the balance wheel assembly.*

*If wedge pin cannot be loosened through hole, remove the two balance bridge screws and carefully remove the balance bridge and balance wheel assembly from movement to permit access to the wedge pin.

Cleaning the Model 253 Movement

The best way to clean the Model 253 movement is to disassemble the movement only to the point of removing the balance bridge and the balance wheel assembly. The movement should be placed in the watch cleaning machine (including ultrasonic baths), preferably on edge to insure proper drainage of the fluids. The movement must be emersed in two sets of rinsing fluid. The final rinsing solution must be absolutely clean. After cleaning is completed, the movement must be thoroughly dried.

The balance wheel assembly must be cleaned separately in order to prevent damage to the balance staff points and the hairspring.

Other metal parts may be cleaned in the same manner as the movement.

Only standard watch cleaning solutions should be used in the above cleaning procedures.

Caution must be exercised when cleaning cases, dials, hands, special rings, etc. which may contain materials other than metal because paint, lacquer and plastic finishes can be damaged by some standard watch cleaning solutions.

For lubrication instructions see Page 253.7.

For reassembly instructions see Page 253.15.

Lubricating the Model 253 Movement

The Timex Model 253 movement should be lubricated using only high grade watch lubricants.

Apply non-spreading type oil (Moebius Synt-a-lube oil is used in the factory) to the following points (see front and back views at left).

Minute pinion stud at top of minute pinion

Both pivots of index lever

Both pivots of index wheel pinion

Both pivots of sweep seconds pinion

Back pivot of third wheel assembly

Junction of minute wheel with dial ring

Junction of minute wheel with plate assembly. (Through stem bracket slot in train bridge)

Index wheel on driving face of three teeth

Index lever fork where it contacts impulse pin.

Friction washer and sweep second pinion bearing surface at their junction.

Fill v-conic bearings $\frac{3}{8}$ to $\frac{5}{8}$ full, by depth.

Apply spreading type oil (Woods AAAA oil is used in the factory) to the following points.

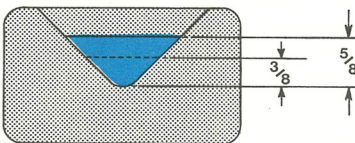
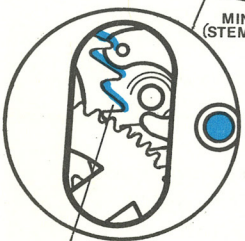
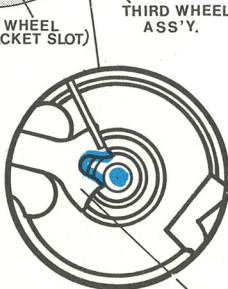
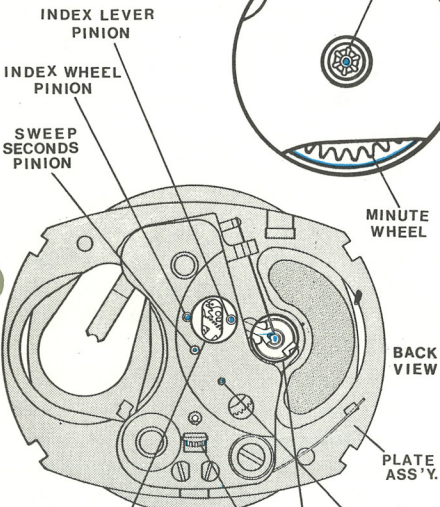
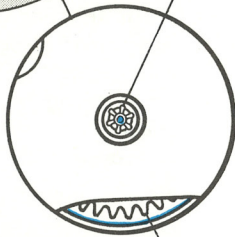
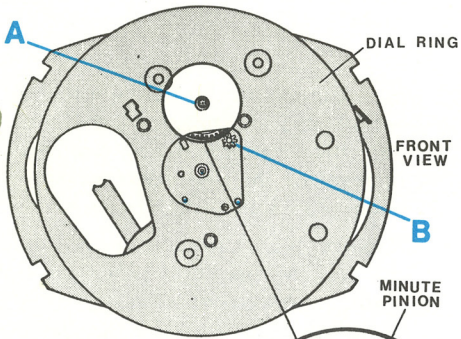
Root of minute pinion teeth (point A in front view) to lubricate minute wheel pinion pivot. Friction pinion at junction with plate assembly (Point B).

Apply watch grease (Hamilton PML is used in the factory) to set stem bracket, set stem teeth and bearing surface (below teeth) prior to assembly of the stem to the watch head.

On water resistant watch models, apply grease (Moebius special lubricant is used in the factory) to $\frac{1}{2}$ of exposed circumference of crown gasket before assembly of the stem to the watch head.

For reassembly instructions see Page 253.15.

253.7



"V-CONIC BEARING"

Operation of the Model 253 Movement

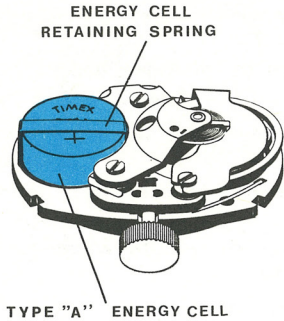


FIGURE A

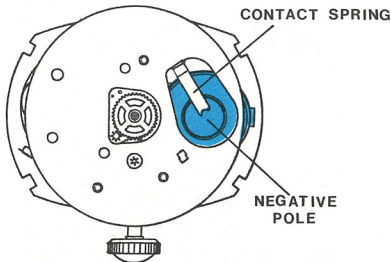


FIGURE B

To examine the function of the Model 253 movement, disassemble the movement as far as removal of the dial (described on pages 253.3 thru 253.5).

Replace the stem and push into the run position and place on a suitable movement ring.

Place the energy cell in position as shown in Figure A and secure with energy cell retaining spring (this spring is available upon request from Timex material sales division in Little Rock, Arkansas).

Note: Negative pole of energy cell must touch the contact spring assembly as shown in Figure B.

Never permit metallic contact between insulated and uninsulated parts of the movement as the short circuit will reduce the life of the energy cell.

With the energy cell in place, the movement should start to run (balance wheel assembly will oscillate)*. If it fails to start immediately, slight rotation of the watch may be necessary to restart the mechanism.

Check that the sweep second staff is moving when the movement is running.

*A minimum balance amplitude of 480° indicates the watch is in satisfactory condition.

Operation of the Model 253 Movement

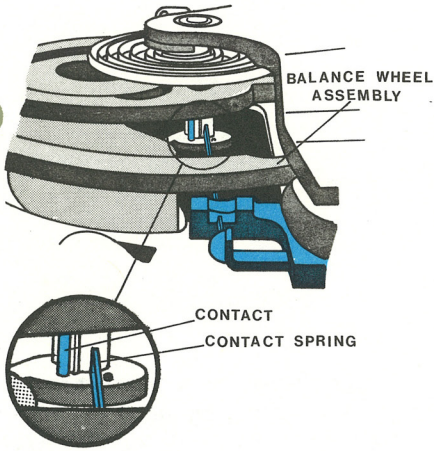


FIGURE C

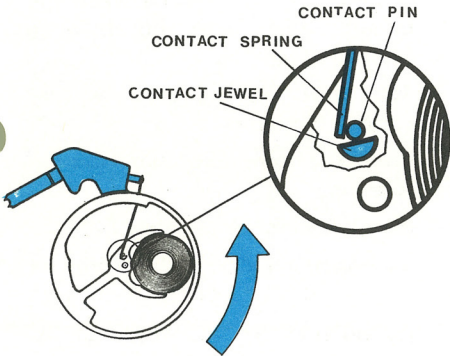
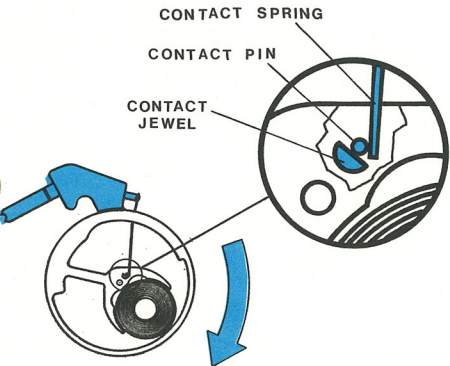


FIGURE D



It is necessary to dismantle the mechanism to observe the action of the movement mechanism.

Remove the stem (described on Page 253.4), the energy cell retaining spring and the energy cell.

Remove the shunt bridge as described on Page 253.5 and replace the shunt bridge screw and tighten.

To observe the action of the contact spring and contact on the balance assembly, proceed as follows (see Figure C).

Rotate the balance assembly slowly from the rest (neutral) position using very light pressure (i.e. a clean brush). The instant the contact spring touches the contact pin on the balance (see Figure D), current flows through the balance coil. The current induces a magnetic field which opposes the field of the permanent magnet and imparts an impulse to the balance assembly.

The purpose of the contact jewel is to limit the contact between the contact spring and the contact pin in order that the flow of current occurs at the proper position during the rotation of the balance assembly.

After the balance returns to its neutral position the same contact process is repeated in the opposite direction (see Figure E).

The above action is the source of mechanical power to drive the movement.

Operation of the Model 253 Movement

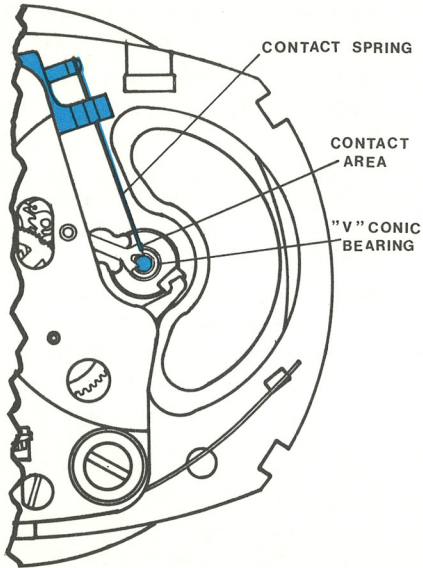


FIGURE F

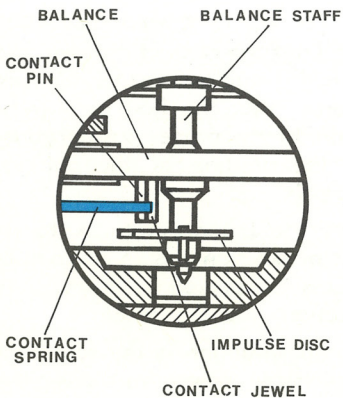


FIGURE G

The position of the contact spring is critical (see Figure F). The spring must be pointing exactly at the center of the balance staff (or v-conic bearing). It should be centered horizontally between the impulse disc and the balance wheel (see Figure G).

The contact spring requires very careful handling.

Protect it from scratches and deforming.

Avoid excessive bending.

Do not touch the contact area at the end of the spring.

Do no rubbing, grinding, polishing, etc. on either side in this area.

Do not attempt to adjust the length of the contact spring.

Do not permit any watch lubricant near the contact pin, contact jewel or contact spring.

Operation of the Model 253 Movement

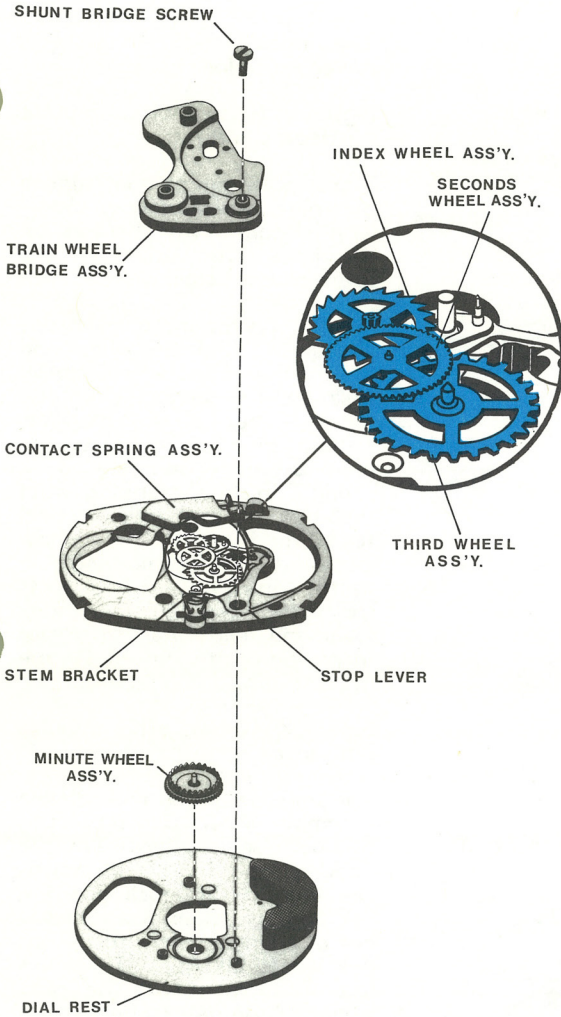


FIGURE H

Remove the balance bridge and balance wheel assembly as described on Page 253.5.

(Remove set stem if necessary)

Remove the shunt bridge screw (see Figure H).

Lift off the train wheel bridge being careful not to disturb the loose parts. Note the position of the various parts on the plate assembly. (The dial rest and the minute wheel assembly may be removed from the bottom of the plate assembly without disturbing the gear train).

Lift the stem bracket, stop lever and contact spring assembly off the plate assembly without disturbing the gear train.

The action of the gear train is as follows:

The third wheel assembly is driven by the pinion on the seconds wheel assembly.

The seconds wheel assembly is driven by the pinion on the index wheel assembly.

Operation of the Model 253 Movement

The index wheel assembly is driven as follows:

Figure J (shown after impulse pin leaves fork).

The impulse pin on the balance assembly, when moving clockwise, engages with the fork on the index lever and moves the lever counter-clockwise.

Pin "D" on the index lever, engages with the index wheel and moves the index wheel clockwise approximately $\frac{3}{4}$ of one tooth. The three magnets (round pins mounted in the plate assembly and labeled A, B and C in the sketches, attract the tips of the index wheel teeth and move the wheel clockwise the remaining $\frac{1}{4}$ tooth. Magnet C also attracts the draw lever on the index lever and holds the draw lever in position until moved by the impulse pin.

Figure K (shown after impulse pin leaves fork).

The impulse pin on the balance assembly, when moving counterclockwise, engages with the fork on the lever and moves the index lever clockwise. Pin "D" on the index lever moves out of engagement with the index wheel and pin "E" moves into engagement with the index wheel. If the index wheel is not positioned correctly by the magnets, pin "E" turns the index wheel to the correct position so that the next engagement of pin "D" (moving counterclockwise) will advance the index wheel clockwise.

Clockwise rotation of the index wheel drives the movement gear train.

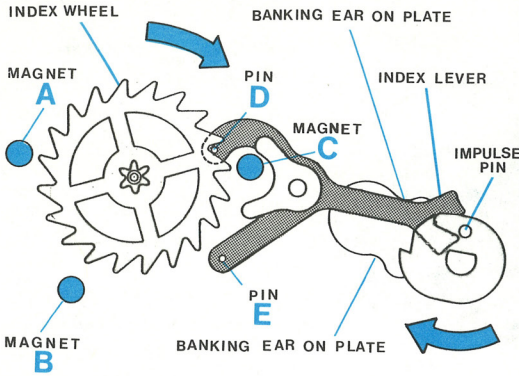


FIGURE J

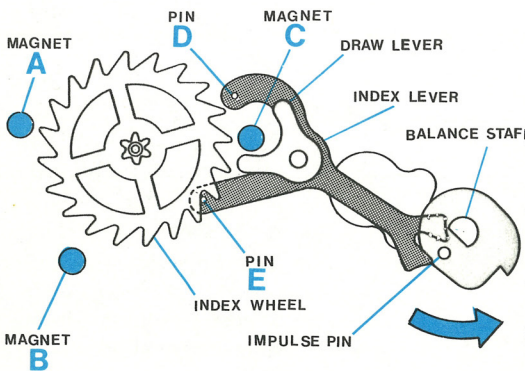


FIGURE K

Operation of the Model 253 Movement

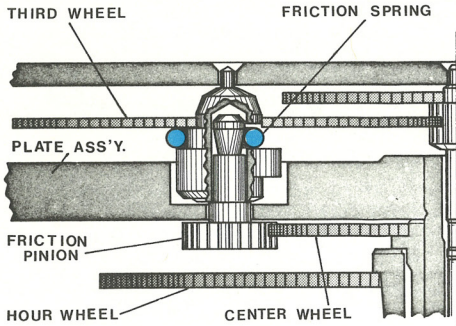


FIGURE L

Setting friction for the dial train is provided by a spring connecting the friction pinion and the third wheel as shown in Figure L.

The friction pinion and third wheel may be separated by lifting the friction pinion with tweezers. It is not necessary to remove the friction spring from the third wheel.

To reassemble, press the friction pinion firmly back into place in the third wheel.

The balance stop mechanism is purely mechanical.

Figure M shows the stop mechanism in the running position. 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 impulse disc.

Figure N shows the stop mechanism in the stopped position (when the stem is pulled out into the set position) in the stopped position, the tip of the stop lever butts against the impulse disc on the balance wheel assembly and stops the balance wheel assembly.

In the stopped position, there is no electrical contact so there is no current drain to shorten the life of the energy cell.

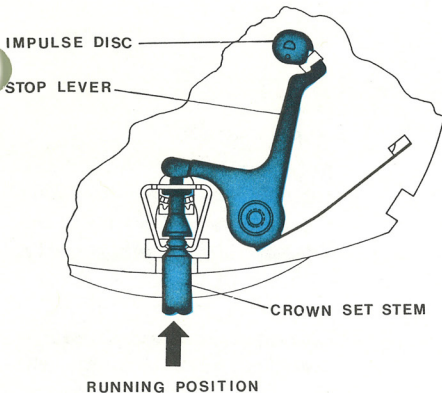


FIGURE M

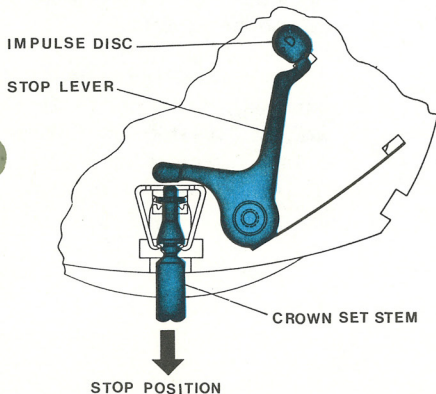


FIGURE N

Operation of the Model 253 Movement

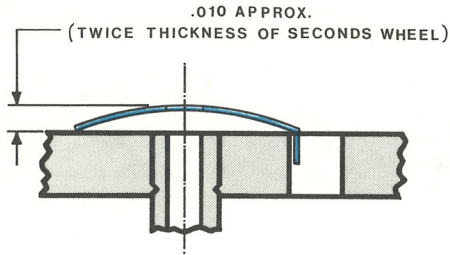


FIGURE P

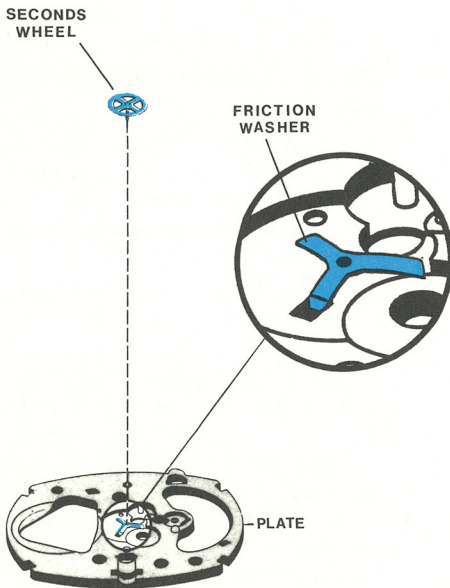


FIGURE Q

A friction washer is located between the plate and the seconds wheel. As shown in Figure P and Figure Q, 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 in the plate to prevent friction washer from turning.

If the complete movement is taken apart, the correct order for reassembly is (see exploded view Page 253.2) :

1. Place the minute wheel assembly in the dial rest and then carefully position the plate assembly on top of the dial rest.
2. Third wheel assembly.*
3. Friction washer.
4. Index lever assembly.
5. Index wheel assembly.
6. Seconds wheel.
7. Stem bracket.
8. Stop lever.
9. Contact spring assembly.
10. Train wheel bridge assembly.
11. Secure with shunt bridge screw.

*The third wheel assembly and the friction pinion should be assembled to the plate assembly as follows: Place friction pinion (pinion side down) on a flat anvil.

Place the plate assembly over the friction pinion. Snap third wheel assembly (with friction spring in position) onto the end of the friction pinion as shown on Page 253.13.

To reassemble balance wheel assembly, assemble the balance bridge assembly to the movement with two (2) balance bridge screws (leave screws loose). Tilt the balance wheel assembly and carefully insert the pivot on the hairspring side into the "V-conic" bearing and then the other pivot into the other "V-conic" bearing; tighten the balance endshake adjusting screw enough to hold the balance wheel assembly in place —see Figure R. Place energy cell connector in position.

BALANCE ENDSHAKE
ADJUSTING SCREW

ENERGY CELL
CONNECTOR

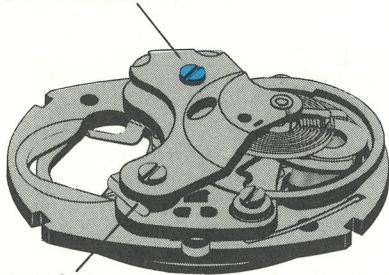


FIGURE R

Reassembly of the Model 253 Movement

Insert the end of the hairspring into the slot in the regulator and then into the hole in the hairspring bracket by rotating the balance wheel and guiding the end of the spring. Check that the impulse pin is in the slot of the index lever and then secure the hairspring in the bracket with the wedge pin.

Adjust the balance wheel endshake using caution to apply minimum downward pressure which could damage the points of the balance staff.

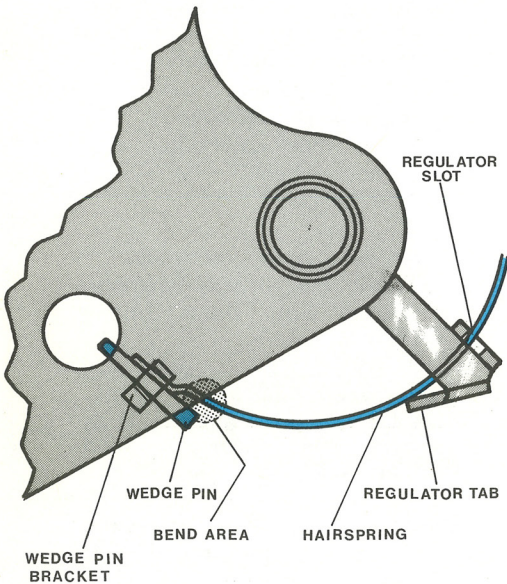


FIGURE S

Loosen the shunt bridge screw, slide the shunt bridge under the hairspring, and secure with shunt bridge screw.

Check for adjustment of hairspring and adjust if necessary. The hairspring should be leveled, centered and in light permanent contact with the inside edge of regulator slot and the regulator tab as shown in Figure S. Hairspring must not leave the described contact points at any time with regulator within normal regulating range.

Hairspring can be adjusted for proper level by grasping spring as close as possible to pinning point. To Adjust centering — grasp 160° to 180° from pinning point. To adjust hairspring to remain in permanent contact with regulator slot and tab, carefully bend tab towards center of spring until desired condition is obtained.

Preposition the hands at 12 o'clock on the dial then position the dial assembly on the movement so the dial tabs pass through the plate assembly. Hold dial in place and bend tabs to secure on plate.

Drive sweep second hand onto end of sweep second staff being sure the hand is below the chamfer on the staff.

Place the movement (and dial assembly) in the case being careful to position it on the locating tabs. Replace crystal to secure movement.

Insert the crown and stem assembly with a turning motion to assure engagement in the stem bracket.

Put fresh Timex energy cell Type A in place (positive (+) side up), position case back and snap closed.

Push crown in and watch will start. If it does not start, slight rotation of the watch may be necessary to restart the mechanism.