

ELECTRIC STOP CLOCK

KS-8259

REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-8259 electric stop clock.

1.02 This section is reissued primarily to add information covering the use of the KS-14249, List 3 switch with the stop clock and to revise the lubrication requirement. Detailed reasons for reissue will be found at the end of the section.

1.03 Reference shall be made to Section 020-010-711 covering general requirements and definitions for additional information necessary for the proper application of the requirements listed herein.

1.04 Asterisk: Requirements are marked with an asterisk () when to check for them would necessitate the dismantling or dismounting of the apparatus, or would affect the adjustment/involvement or other adjustments. No check need be made for these requirements unless the part is made accessible for other reasons or its performance indicates that such a check is advisable.

1.05 One dip of oil for the purpose of this section is the amount of oil retained on a KS-14164 brush after being dipped into the oil to a depth of $\frac{3}{8}$ " and then scraped on the edge of the container to remove the surplus oil. There should not be sufficient oil adhering to the brush to form a drop on the end of the bristles.

1.06 The normal (unoperated) position of the control knob of the KS-14249 switch is that position in which the white dot on the knob is toward the cord.

1.07 The operated position of the control knob of the KS-14249 switch is the position of the knob when it has been turned 90° in a clockwise direction from the normal position.

2. REQUIREMENTS

2.01 Cleaning: The electric stop clock shall be cleaned when necessary in accordance with approved procedures.

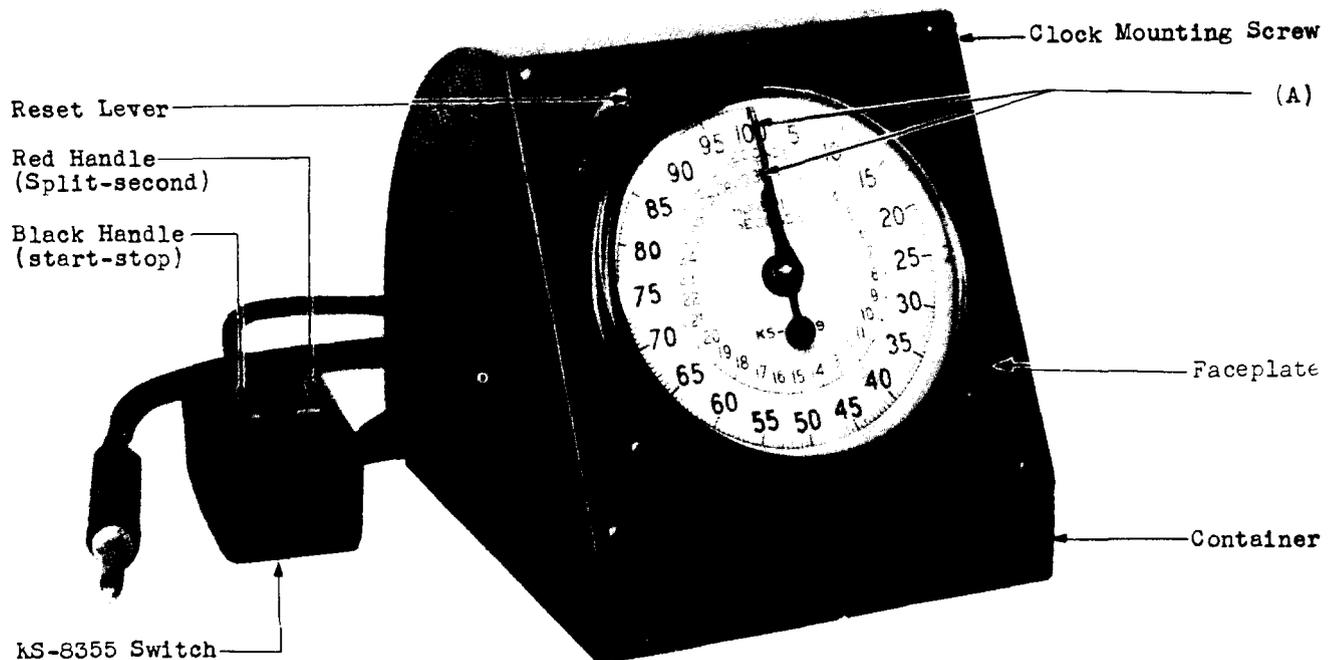


Fig. 1 - KS-8259 Electric Stop Clock

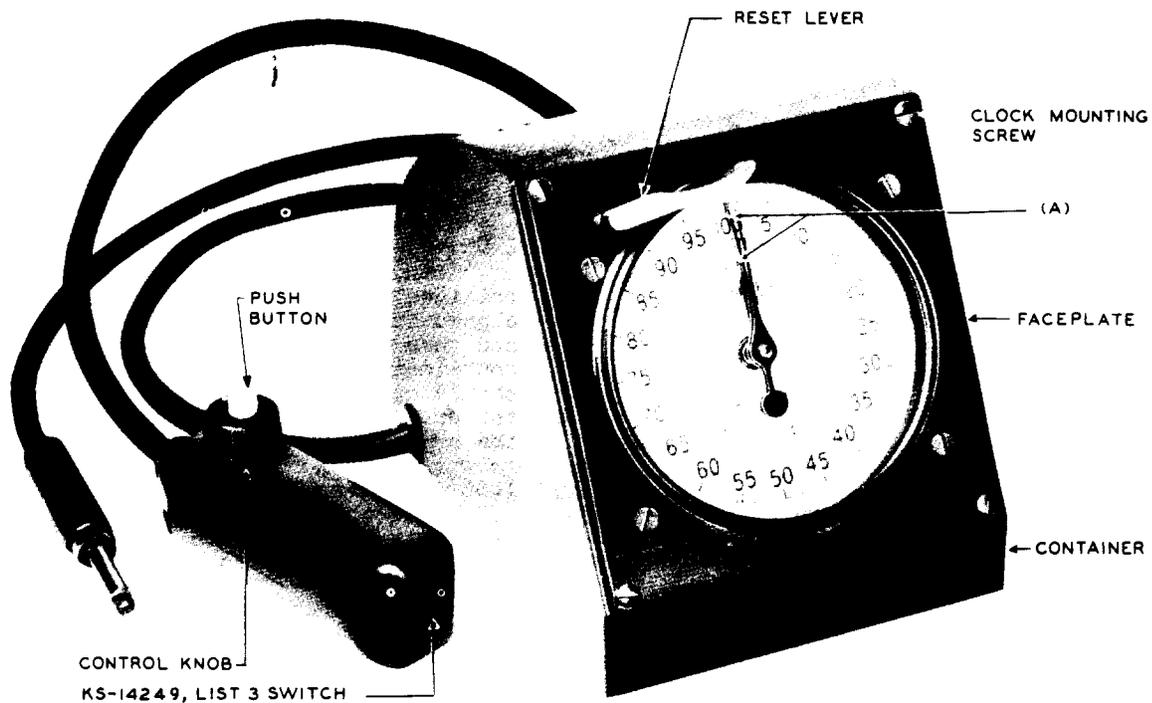


FIG. 2 - KS-8259 ELECTRIC STOP CLOCK EQUIPPED WITH KS-14249, LIST 3 SWITCH

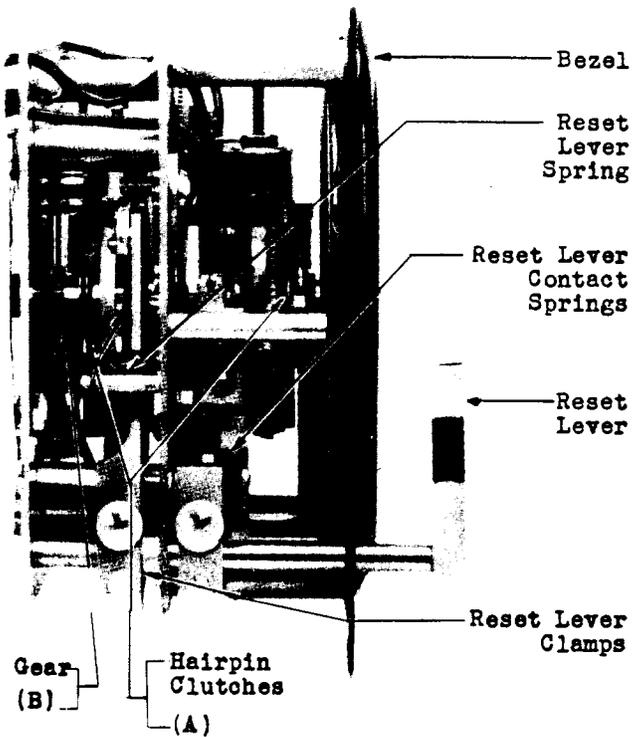


Fig. 3 - Clock and Reset Lever Mechanism

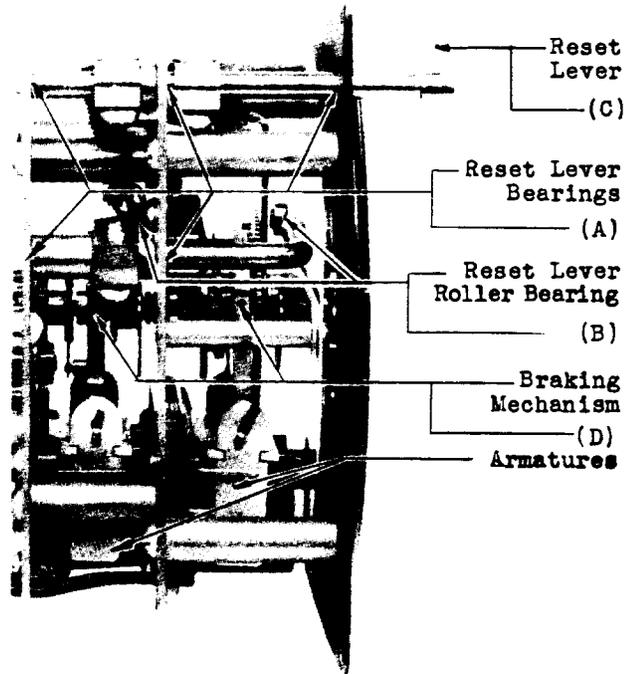


Fig. 4 - Reset Lever Linkage and Bearings

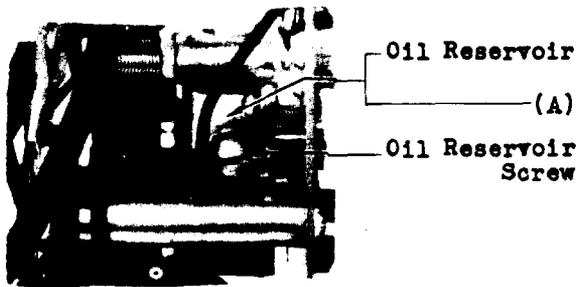


Fig. 5 - Oil Reservoir

2.02 Lubrication

- (a) The points listed below shall be adequately lubricated with KS-7470 oil. When lubrication is necessary, one dip shall be divided between 2 or 3 of the following points:
- * Hairpin Clutches - Fig. 3(A); apply ←
 - to wire and clutch grooves. ←
 - Bearings of Reset Lever - ←
 - Fig. 4 (A).
 - Bearings of Reset Lever Rollers - ←
 - Fig. 4 (B).
- (b) Fig. 3 (B): The teeth on the gear associated with the motor pinion shall be adequately lubricated with KS-7470 oil. When lubrication is ← necessary, one dip of oil shall be distributed over four gear teeth.
- (c) Fig. 5 (A): The motor reservoir ← shall be filled with KS-7470 oil to such a level that with the clock tilted from its normal position, as described below, the oil will just start to flow out of the reservoir. To check the amount of lubricant in the motor reservoir proceed as follows. Remove the oil reservoir screw and washer with the 3" cabinet screwdriver. Rest the bottom edge of the faceplate on a flat surface. Then using the right bottom corner of the faceplate as a pivot, raise the left bottom corner about 1".
- (d) Recommended Lubrication Intervals: After turnover it is recommended that the parts listed above be lubricated at intervals of one year. This interval may be extended if periodic inspections have indicated that local conditions are such as to insure that the requirements will be met during the extended interval.

2.03 Freedom of Movement

- *(a) All moving parts shall be free from bind.

Gauge by eye and feel.

- (b) The elapsed-time, split-second and totalizing hands shall not interfere with each other or with the face or crystal in any position.

Gauge by eye.

2.04 Accuracy of Clock Movement: The clock movement shall not gain or lose any time during an interval of 100 seconds.

Check the stop clock, after allowing it to operate for approximately 10 minutes, against an electric clock of known accuracy operating from the same frequency. ↗ ↘

2.05 Movement of Elapsed-Time, Split-Second and Totalizing Hands

Clock Equipped with KS-8355 Switch ←

- (a) With the black handle (start-stop) and red handle (split-second) switches of the KS-8355 switch closed to the operating positions, the elapsed-time and split-second hands shall rotate and the split-second hand shall be in alignment with the elapsed-time hand.

Gauge by eye.

- (b) Fig. 6 (A) - When the red handle switch of the KS-8355 switch is closed to the stop position, the split-second hand shall stop without interrupting the travel of the elapsed-time hand but when the red handle switch is again closed to the operating position, the split-second hand shall realign itself with the elapsed-time hand.

This requirement shall be checked within the first 50 seconds of the movement of the hands from the normal position and again within 50 to 100 seconds of the movement of the hands from the normal position.

Note: The split-second hand may not realign itself with the elapsed-time hand if it is released when it is 180° from the elapsed-time hand. In this case, stop the split-second hand and allow the elapsed-time hand to rotate further before releasing the split-second hand again. ↗ ↘

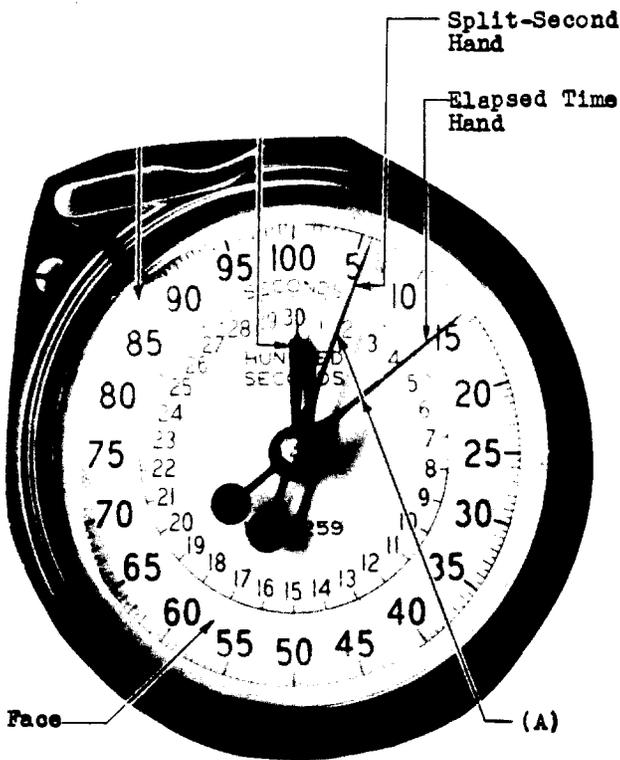


Fig. 6 - Position of Hands

(c) With the clock connected to the proper source of power and the start-stop and split-second switches operated to the stop position, the operation and release of the reset lever shall restore the hands to the normal position from any other position.

Note: The hands may not restore to normal when the elapsed-time hand is between 48-52 on the seconds dial. In this case, start the clock and allow the elapsed-time hand to rotate beyond 52 before operating the reset lever.

(d) Fig. 1 (A) - When the hands restore to normal, the elapsed-time and split-second hands shall point to the graduated line indicating 100 on the seconds dial and the totalizing hand shall point to the graduated line indicating 30 on the 100 seconds dial.

Gauge by eye.

Clock Equipped with KS-14249, List 3 Switch

(e) With the control knob of the switch turned to the operated position, the elapsed-time and

split-second hands shall rotate and the split-second hand shall be in alignment with the elapsed-time hand.

Gauge by eye.

(f) Fig. 6 (A) - When the push button of the switch is depressed while the control knob is in the operated position, the split-second hand shall stop without interrupting the travel of the elapsed-time hand. When the push button is released, the split-second hand shall realign itself with the elapsed-time hand.

This requirement shall be checked within the first 50 seconds of the movement of the hands from the normal position, and again within 50 to 100 seconds of the movement of the hands from the normal position.

Note: The split-second hand may not realign itself with the elapsed-time hand if it is released when it is 180° from the elapsed-time hand. In this case, stop the split-second hand and allow the elapsed-time hand to rotate further before releasing the split-second hand again.

(g) With the clock connected to the proper source of power, and the control knob in the normal position, the operation and release of the reset lever shall restore the hands to the normal position.

Note: The hands may not restore to normal when the elapsed-time hand is between 48-52 on the seconds dial. In this case, start the clock and allow the elapsed-time hand to rotate beyond 52 before operating the reset lever.

(h) Fig. 2 (A) - When the hands restore to normal, the elapsed-time and split-second hands shall point to the graduated line indicating 100 on the seconds dial and the totalizing hand shall point to the graduated line indicating 30 on the 100 seconds dial.

Gauge by eye.

2.06 Position of Reset Lever - Fig. 4 (C): The reset lever shall restore to its uppermost position after it has been operated and then released.

Gauge by eye and feel.

2.07 Operation of Braking Mechanism - Fig. 4 (D): The braking mechanism shall stop the associated disc from

revolving when the associated armatures are released.

Gauge by eye.

2.08 Position and Movement of Reset Lever Contact Springs

(a) With the reset lever in the uppermost position, the reset lever contacts shall be open.

Gauge by eye.

(b) The reset lever contacts shall close on the downward movement of the reset lever before the lever reaches the mid-position of its downward movement.

Gauge by eye.

KS-14249, List 3 Switch - Fig. 7

*2.09 Spring Clearance

(a) With the control knob in the normal position, the clearance between spring 2 and the outer corner of the cam shall be

Max. .012"

Gauge by eye.

(b) With the control knob in the normal position, the clearance between the end of the plunger and spring 6, with the play of the knob and the push button taken up to produce a maximum clearance, shall be

.025"

Gauge by eye.

*2.10 Spring Tension

(a) With the control knob in the normal position, the pressure of spring 3 against its associated cam surface shall be

Min. 25 grams
Max. 75 grams

Use the No. 70J gauge applied at the end of the spring.

(b) With the control knob in the normal position, the pressure of spring 2 against its associated cam surface shall be

Min. 75 grams
Max. 125 grams

Use the No. 70J gauge applied at the end of the spring.

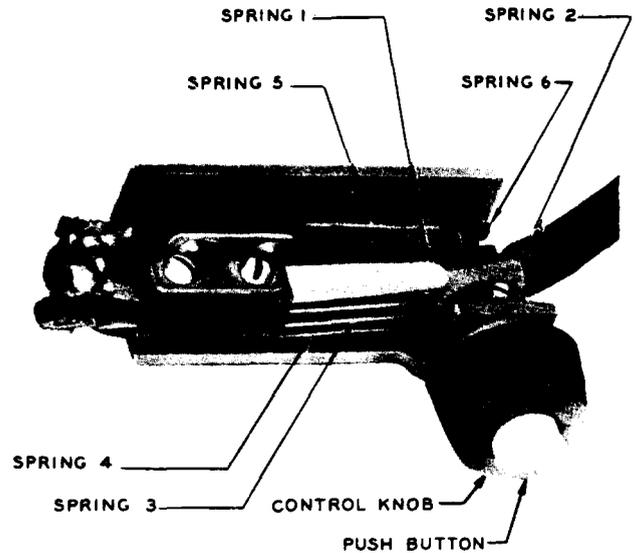


FIG. 7-KS-14249, LIST 3 SWITCH

*2.11 Contact Separation

(a) With the control knob in the normal position, the separation between the contacts of springs 1 and 2 and between the contacts of springs 3 and 4 shall be

Min. .020"

Gauge by eye.

(b) With the push button in the control knob fully depressed, the separation between the contacts of springs 5 and 6 shall be

Min. .025"

Gauge by eye.

*2.12 Contact Pressure

(a) With the push button in the control knob in the undepressed position, springs 5 and 6 shall not break contact when a pressure of

Min. 100 grams

is applied to spring 6.

Use the No. 70J gauge, applied adjacent to the point where the plunger touches the spring.

(b) With the control knob in the operated position, springs 3 and 4 shall not break contact when a pressure of

Min. 65 grams

is applied to spring 4.

Use the No. 70J gauge.

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges and Materials

<u>Code or Spec No.</u>	<u>Description</u>
<u>Tools</u>	
303	Spring Adjuster
417A	1/4" and 3/8" Hex. Open Double End Flat Wrench
485A	Smooth Jaw Pliers
→ KS-7782	Parallel Jaw Pliers
→ KS-14164	No. 4 Artists Show Card Brush
-	Medicine Dropper
-	3" Cabinet Screwdriver
<u>Gauges</u>	
→ 70J	0-150 Gram Gauge
<u>Materials</u>	
KS-2423	Cloth
→ KS-7470	Oil
KS-7860	Petroleum Spirits

3.002 It will be necessary to remove the clock from the container or the KS-14249 switch from the case to make most of the adjustments involved. To remove the clock, remove the clock mounting screws with the 3" cabinet screwdriver. Pull the cords through the container as far as necessary in order to make the adjustments. In most cases it will also be necessary to remove the dust shield. To gain access to the switch, remove the screws of the switch case using the 3" cabinet screwdriver and remove the switch from the case. After the adjustments have been made, securely remount the clock in the container and the switch in the case.

3.01 Cleaning (Rq. 2.01)

- (1) Clean the external parts of the stop clock with a dry KS-2423 cloth.
- (2) To clean the face of the clock, push out the bezel with the fingers by exerting pressure against the lips of the bezel at the rear of the faceplate and force the bezel away from the faceplate. Wipe the face

with a clean dry KS-2423 cloth taking care not to bend the hands. Remount the bezel in place.

- (3) Clean the dust shield and motor with the KS-2423 cloth.

3.02 Lubrication (Rq. 2.02)

- (1) Lubricate the various parts with the specified lubricant applied with the KS-14164 brush.
- (2) To replenish the oil in the motor reservoir use a medicine dropper to convey the oil to the reservoir. Fill the reservoir to the specified level and insert and securely tighten the washer and oil reservoir screw.

3.03 Freedom of Movement (Rq. 2.03)

- (1) If parts of the clock appear to bind, refer the matter to the supervisor.
- (2) If the hands bind on each other, or on the crystal or the face, remove the bezel as outlined in 3.01. Adjust the hands as required with the No. 485A pliers. Remount the bezel.

3.04 Accuracy of Clock Movement (Rq. 2.04)

- (1) If the clock movement fails to keep accurate time, refer the matter to the supervisor.

3.05 Movement of Elapsed-Time, Split-Second and Totalizing Hands (Rq. 2.05)

- (1) If the movement of the elapsed-time, split-second and totalizing hands is not satisfactory, the trouble may be due to faulty electrical connections, to a defective KS-8355 or KS-14249 switch or defective stop clock mechanism.
- (2) If the electrical connections are faulty, correct them as required.
- (3) If the KS-8355 switch is defective, replace it with the KS-14249, List 3 switch.
- (4) If the stop clock does not operate satisfactorily when equipped with the KS-14249 switch, check that the switch connections to the clock are as follows:

<u>KS-14249 Switch Connection</u>	<u>KS-8259 Clock Terminal</u>
No. 1	Yellow
No. 2	Red
No. 3 (not used)	-
No. 4	Green

(5) If, after checking the switch connections, the stop clock does not operate satisfactorily, check requirements 2.09 to 2.12 inclusive.

(6) If the stop clock still does not operate satisfactorily, refer the matter to the supervisor.

3.06 Position of Reset Lever (Rq. 2.06)

(1) If the reset lever does not restore to its uppermost position after being depressed and then released, the trouble may be due to bind of the lever shaft in its bearings, to the lever shaft clamps being loose on the shaft or to a weak or defective reset lever spring. If binding of the reset lever is due to dirt or a gummy substance collecting in the bearings, flush the bearings with KS-7860 petroleum spirits applied with a KS-14164 brush. Remove the deposit with a clean KS-2423 cloth and lubricate as described in 3.02. If the movement of the lever is still unsatisfactory, refer the matter to the supervisor.

3.07 Operation of Braking Mechanism (Rq. 2.07)

(1) If the braking mechanism does not stop the associated disc from rotating, proceed as follows. Loosen the armature adjusting screw lock nut associated with the mechanism at fault with the No. 417A wrench and adjust the adjusting screw out as required with the 3" cabinet screwdriver. Then while holding the screw in place tighten the lock nut securely with the No. 417A wrench.

3.08 Position and Movement of Reset Lever Contact Springs (Rq. 2.08)

(1) To adjust the contact springs, adjust them toward or away from each other as required with the No. 303 spring adjuster.

KS-14249, List 3 Switch

- 3.09 Spring Clearance (Rq. 2.09)
- 3.10 Spring Tension (Rq. 2.10)
- 3.11 Contact Separation (Rq. 2.11)
- 3.12 Contact Pressure (Rq. 2.12)

(1) If any of the switch requirements are not met, check that the spring clamping screws are tightened securely.

(2) Check that the cam shaft of the knob is free from foreign matter. If necessary, clean the cam shaft with a KS-2423 cloth moistened with KS-7860 petroleum spirits.

(3) If any of the requirements still are not met, adjust the contact springs as required with the KS-7782 pliers. When adjusting spring 2 for proper clearance at the outer corner of its associated cam, apply the pliers to the spring so that the tip of the spring may be bent at a point 5/16" from its end. For all other spring adjustments, apply the pliers to the springs as close to the insulators as possible.

REASONS FOR REISSUE

1. To revise the lubrication requirement by specifying KS-7470 oil instead of KS-6232 oil, Gulf Gem B oil and petrolatum. (2.02)
2. To add definitions, requirements and procedures for the KS-14249, List 3 switch. (1.06, 1.07, 2.05, 2.09-2.12, 3.002, 3.05 (4)-(7) and 3.09-3.12)
3. To revise the method for checking the accuracy of the clock movement. (2.04)
4. To add a note amplifying the requirement concerning the realignment of the split-second hand with the elapsed-time hand. (2.05(b))
5. To add a note amplifying the requirement concerning resetting the clock hands to their normal position. (2.05(d))
6. To revise the list of tools, gauges and materials. (3.001)