

MOTOR DRIVEN SWITCHBOARD CLOCK KS-8263 REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-8263 motor driven switchboard clock.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

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 dismantling of apparatus or would affect the adjustments involved or other adjustments. No check need be made for these requirements unless the apparatus or 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 No. 4 Artist's show card brush after being dipped into the oil to a depth of 3/8" and then scraped twice on the edge of the container to remove the surplus oil. There shall not be sufficient oil adhering to the brush to form a drop on the end of the bristles.

2. REQUIREMENTS

2.01 **Cleaning:** Clean all parts, when necessary, in accordance with the approved procedures covered in part 3 of this section.

2.02 Lubrication

(a) The following points shall be adequately lubricated with KS-6232 oil. When lubrication is necessary one dip shall be distributed

over three or four points. Surplus or improper oil may cause operating trouble and should therefore be avoided.

- (1) Fig. 3(A) — Motor Pinion
- (2) Fig. 3(B) — Gear Shaft Bearings
- (3) Fig. 3(C) — Rocker Arm Bearings
- (4) Fig. 3(D) — Roller Bearings

(b) If the movement of the drums causes squeaking the surfaces of the drum supports over which the drums move shall be lubricated with Western Electric Lubricating compound No. 3.

Caution: Do not use oil and do not permit any lubricating compound to get on the edges or sides of the drums.

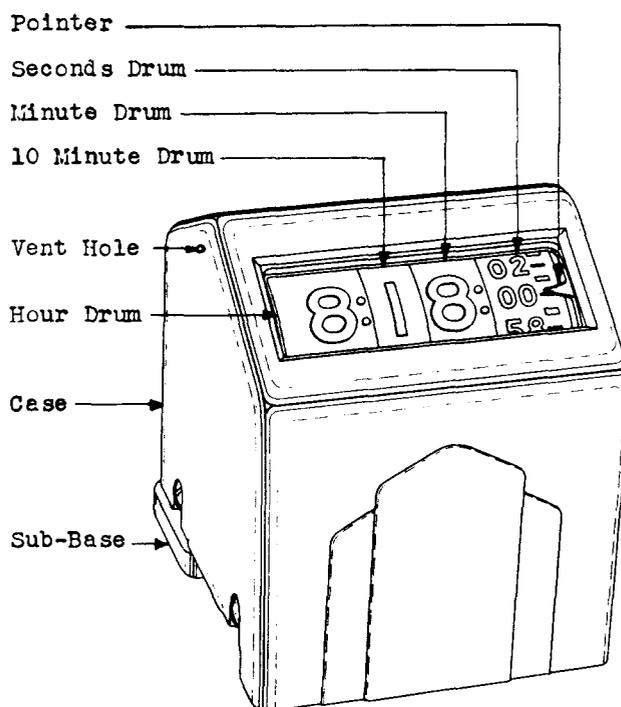


Fig. 1 — KS-8263 Switchboard Clock

(c) **Recommended Lubrication Intervals:**

Clocks shall not be lubricated by the installer prior to turnover to the Telephone Company. After turnover, it is recommended that the parts listed in (a) be lubricated at intervals of 1 year. This interval may be extended if periodic inspections have indicated that local conditions are such as to insure that the requirement will be met during the extended interval.

2.03 Accuracy of Clock Movement: The clock movement shall not gain or lose time over a period of 48 hours when connected to a power supply regulated for time service. Check by comparing with a reliable time source.

***2.04 Backlash of Gears:** There shall be some backlash between each pair of gears.
Gauge by feel.

***2.05 Freedom of Movement of Cam, Roller and Rocker Arm:** The cam and roller shall operate freely and the rocker arm shall not bind in its bearings.
Gauge by eye and feel.

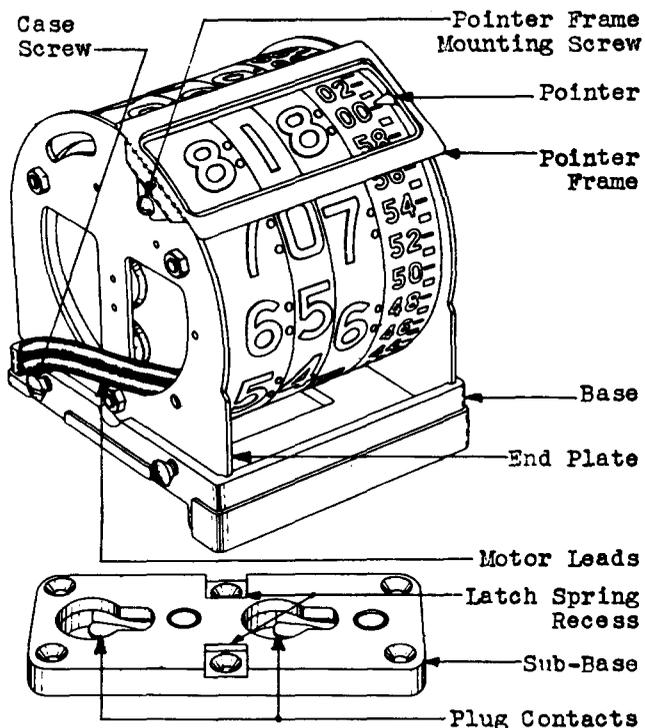


Fig. 2 - KS-8263 Clock (Case Removed) and Sub-Base

***2.06 Freedom of Movement of Drum Operating Fingers:** The drum operating fingers shall move freely on their bearings.
Gauge by feel.

***2.07 Alignment of Drum Operating Fingers:** After assembly of the drums, all drum operating fingers shall point in the direction of movement of the drums and the plates and stops on the fingers shall touch each other on the side which insures the fingers being in line with each other.
Gauge by eye.

2.08 Position of Seconds Drum: The position of the seconds drum with respect to the gear and cam assembly shall be such as to insure the advance of the minute, 10 minute and hour drums during the interval when the "00" to "02" divisions on the seconds drum are passing the pointer.
Gauge by eye.

Caution: Do not rotate the seconds drum by hand as damage to the motor may result.

2.09 Freedom of Movement of Time Drums: All drums shall be capable of being raised vertically $1/32''$
Gauge by eye.

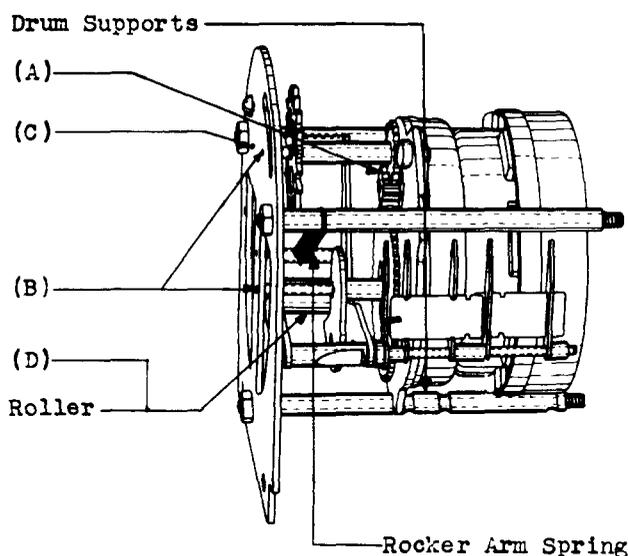


Fig. 3 - KS-8263 Clock Partially Disassembled

- (a) To check, raise the drums with the fingers.

Caution: Exercise care not to lift the time drums forcibly, as they may bind in the raised position due to surface irregularities on the sides of the drums.

2.10 Rocker Arm Spring Tension: The tension of the rocker arm spring shall be sufficient to advance the minute, 10 minute and hour drums simultaneously for one digit position.

Gauge by eye.

- (a) Rotate the minute drum to position 9 and the 10 minute drum to position 5 as read in the pointer frame. Operate the clock electrically. As the "00" to "02" divisions on the drum pass the pointer, the hour, 10 minute and minute drums shall advance one position.

2.11 Alignment of Drum Numerals: When the clock is operated electrically the numerals on the minute, 10 minute and hour drums shall not be out of line with each other more than

1/16"

Gauge by eye and use the upper or lower edge of the pointer frame as a reference.

- (a) To check for numerical alignment operate the clock electrically and note that as the "00" to "02" divisions on the seconds drum pass the pointer the minute drum advances one division and meets the alignment requirement. Repeat this check for two additional movements of the minute drum. Manually rotate the minute drum to 9 and check that the minute and 10 minute drums advance properly. Make two additional checks of the minute and 10 minute drum. Now rotate the minute drum to 9 and the 10 minute drum to 5 and check the movement of the hour, 10 minute and minute drums. Make two additional checks of the hour, 10 minute and minute drums.

2.12 Plug Contact Pressure: The plug contact in the sub-base shall make reliable electrical contact with the plugs on the bottom of the clock base.

Gauge by eye.

Note: This requirement is considered met if with the clock removed from the sub-base the free ends of the plug contacts extend up-

ward into the cut-out portion of the sub-base into which the terminals on the clock base are fitted.

2.13 Tightness of Clockcase Window: The clockcase window shall be secure.

Judge by feel.

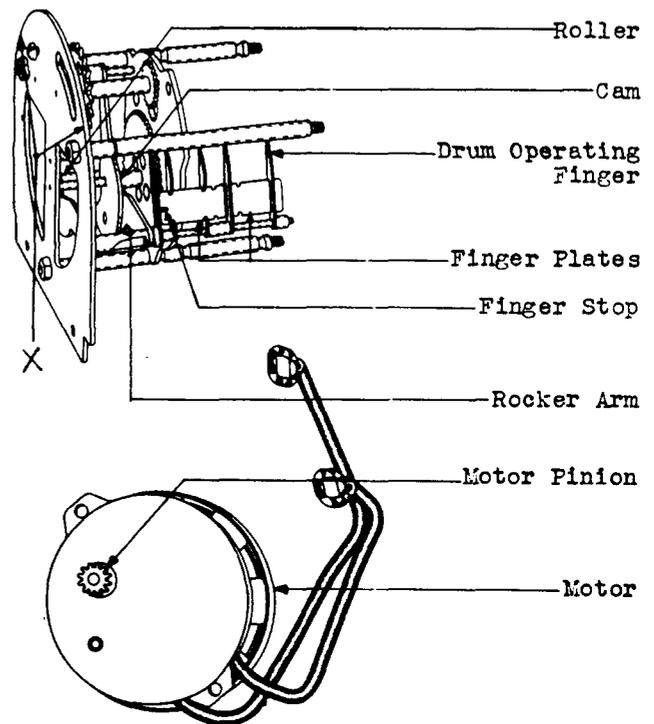


Fig. 4 - Gear and Cam Assembly and Motor

3. ADJUSTING PROCEDURES

3.001 List of Tools and Materials

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
206	30° Offset Screwdriver
485A	Smooth Jaw Pliers
556A	7/32-Inch Hex. Double-end Socket Wrench
KS-6854	3-1/2 Inch Screwdriver
R-1051	6-Inch Pillar File
KS-14164	No. 4 Artist's Show Card Brush

SECTION 030-113-701

CODE OR SPEC NO.	DESCRIPTION
MATERIALS	
KS-2423	Cloth
or	
D-98063	Cloth
KS-6232	Oil
W.E.Co. No. 3	Lubricating Compound
—	Toothpick, Hardwood, Flat at One End and Pointed at the Other
—	Duco Household Cement

3.002 Ventilation: For clock cases which are not provided with vent holes, drill a 3/32-inch hole in each end of the case, near the top as shown in Fig. 1, in order to prevent moisture from condensing inside the clock.

3.003 Removal of Clock from Service and Preparation for Adjustment: Remove a clock from the type of sub-base illustrated in Fig. 2, by pressing the latch spring at the rear of the clock against the case. Slide the clock to the left or right, depending on the manner of mounting. Remove a clock which is recessed in the keyshelf by lifting it vertically from its mounting. Loosen the four case screws with the KS-6854 screwdriver and withdraw the clock mechanism from the case. If the clock mechanism sticks in the case insert the blade of the screwdriver between the head of the case screw and the top of the associated notch in the case and force the case upward a slight amount by turning the screwdriver. Repeat this operation at each of the four case screws. Take care not to force the case too far at each operation as there is danger of cracking or chipping the case. Repeat the operation until the clock mechanism can be withdrawn from the case. Before remounting the case file a slight amount from the edges of the end plates for approximately 1 inch down from the points designated X in Fig. 4, using the R-1051 pillar file. This will usually be sufficient to relieve the bind and permit easy removal of the mechanism from the case. Do not remove more metal than is necessary to relieve the bind and carefully remove all filings.

3.004 Restoring Clock to Service: Remount the case and tighten the case screws securely. Rotate the hour and 10 minute drum

manually through the opening in the base to agree with the reading on a standard time source or an adjacent clock which is in operation and indicating the correct time. Rotate the minute drum to read one minute faster than the minute drum of the reference clock. Press the latch and position the clock over the sub-base and when readings of the minutes and seconds of the two clocks are approximately the same insert the clock in the sub-base. When in operation, the time indicated by the two clocks should not vary more than 1 second. If the clocks differ by more than 1 second disconnect the clock and repeat the operation.

3.01 Cleaning (Reqt 2.01)

3.02 Lubrication (Reqt 2.02)

(1) Clean the case, base and time drums by wiping with a clean dry D-98063 cloth.

(2) If the movement of the time drums cause a squeak or when other parts require lubrication, first remove the case as outlined in 3.003 and then remove the two plugs (terminals on bottom of base) from the base with the KS-6854 screwdriver. Remove the four case screws and the base. Loosen the pointer frame mounting screws with the KS-6854 screwdriver and remove the pointer frame. Remove the three end plate mounting nuts on the motor end with the No. 556A wrench and lift off the end plate. Lift the four time drums from the clock frame. If the finger which actuates the minute drum obstructs the removal of the seconds drum, depress the rocker arm by hand sufficiently to permit the removal of the seconds drum.

(3) Lubricate the drum supports over which the drums slide, using the No. 4 Artist's show card brush to apply the lubricant. Lubricate the other parts of the clock, applying the oil with the No. 4 Artist's show card brush. Distribute the oil retained by the brush after each dip as specified.

Caution: *Keep the application of lubricant at each point to a minimum and wipe off any excess with the D-98063 cloth. Excess oil tends to creep and if the sides of the drums become coated the clock may fail to keep correct time.*

(4) To reassemble the clock first arrange all fingers on the rocker arm to point away from the motor mounting position and make sure that the plates and stops on the fingers strike each other on the proper side to insure the fingers being in line with each other. The position of the fingers will be correct if all the fingers can be raised by means of the single finger adjacent the gears. With the roller at the lowest point of the concave side of the cam, remount the motor, if it was removed, so that the motor gear engages with the two associated gears of the drum driving assembly. Tighten the motor mounting screws securely. Make sure all drum actuating fingers are pointing up (in the direction of movement of the drums) and mount the seconds drum, depressing the finger arm, if necessary to permit the drum passing the finger which actuates the minute drum. Position the seconds drum on the driving gear so that the "02" seconds position is directly adjacent to the screw which mounts the pointer frame. Remount the three remaining time drums in proper order. Pass both motor leads through the opening in the end plate which is below the pointer frame mounting screw. (See Fig. 2.) Be careful that the leads are not stretched and the insulation cut at the points where the leads contact the end plate. Position the end plate with the pointer frame mounting screw facing out and tighten the end plate mounting nuts securely. Remount the pointer frame and tighten its mounting screws securely. Reposition the terminals of the motor leads in the base and tighten the two plugs and nuts in the base. (See Fig. 2.) Position the clock in the base and tighten the case screws. Check the movement of the time drums and if necessary disassemble the clock sufficiently to correct for binding parts. Reassemble the clock.

3.03 *Accuracy of Clock Movement* (Reqt 2.03)

(1) If the clock fails to keep satisfactory time remove the time drums as outlined in 3.02(2) and wipe off the sides and edges of the drums with a clean dry D-98063 cloth. Reassemble the clock as outlined in 3.02(4). If the clock still fails to keep satisfactory time or if the motor is noisy in its operation it is an indication that the motor requires relubrication. Remove the time drums as outlined in 3.02(2) and remove the motor mounting screws

with the KS-6854 screwdriver or the No. 206 offset screwdriver. Remove the motor from the frame. Substitute a spare motor and reassemble the clock as covered in 3.02(4). Return the original motor to the supplier for complete relubrication.

3.04 *Backlash of Gears* (Reqt 2.04)

(1) If there is insufficient backlash between gears refer the matter to the supervisor.

3.05 *Freedom of Movement of Cam, Roller and Rocker Arm* (Reqt 2.05)

3.06 *Freedom of Movement of Drum Operating Fingers* (Reqt 2.06)

3.07 *Alignment of Drum Operating Fingers* (Reqt 2.07)

(1) If the cam, roller, rocker arm or drum operating fingers do not operate freely or uniformly, disassemble the clock as outlined in 3.02(2), except that it may or may not be necessary to remove the motor, depending on the adjustment to be made. Lubricate the part or parts covered in 2.02 which do not operate freely and straighten any bent or misaligned parts. Use the fingers or No. 485A pliers to straighten bent or misaligned parts. Position the drum operating fingers as covered by 2.07, if necessary removing the motor as outlined in 3.03, to position the fingers. Reassemble the clock as outlined in 3.02(4).

3.08 *Position of Seconds Drum* (Reqt 2.08)

(1) To adjust the position of the seconds drum, disassemble the clock as outlined in 3.02(2), without dismounting the motor. Reassemble the clock as outlined in 3.02(4), making sure that the roller is at the lowest point of the concave side of the rocker arm cam when the seconds drum is positioned. Position the seconds drum on its driving gear with the "02" seconds position directly adjacent the screw which mounts the indicator.

3.09 *Freedom of Movement of Time Drums* (Reqt 2.09)

(1) If the time drums do not rotate freely it may be due to contact with the motor leads, bent drum operating fingers or misalignment of parts. Disassemble the clock as outlined in 3.02(2) and as required to correct for binding or misalignment of parts. Reassemble the clock as outlined in 3.02(4).

3.10 *Rocker Arm Spring Tension* (Reqt 2.10)

3.11 *Alignment of Drum Numerals* (Reqt 2.11)

- (1) If the tension of the rocker arm spring is insufficient to advance the minute, 10 minute and hour drums or if the time drums do not advance properly to line up in the pointer frame, it may be due to binding or misaligned parts. Check requirements 2.05, 2.06, 2.07 and 2.09 and make adjustments as required. If the drums still do not advance properly the rocker arm spring tension may be unsatisfactory. In this case refer the matter to the supervisor.

3.12 *Plug Contact Pressure* (Reqt 2.12)

- (1) To adjust the tension of the plug contacts remove the sub-base mounting screws with the KS-6854 screwdriver and adjust the plug

contacts with the fingers. Reposition the sub-base and replace and tighten the mounting screws securely.

3.13 *Tightness of Clockcase Window*

(Reqt 2.13)

- (1) When the clockcase window is fastened to the clockcase by means of the pointer frame, screws, and nuts and becomes loose, secure the window as follows. Loosen the pointer frame mounting screws with the KS-6854 screwdriver, push the pointer frame in a direction to tighten the window, and then tighten the pointer frame mounting screws. When the clockcase window is fastened to the pointer frame instead of the clockcase and becomes loose, recement the window to the pointer frame, using Duco household cement.