

KS-15509 A-C MOTOR DRIVEN INTERRUPTER REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers an a-c motor driven spring-type interrupter which is used in ringing power plants. The single-phase synchronous capacitor-type motor operates at a speed of 1800 rpm and is equipped with an enclosed gear train. The lists 1 and 4 and lists 2 and 5 machines have a gear reduction ratio of 180:1 thus turning the interrupter shaft at 10 rpm. The lists 3 and 6 machines have a gear reduction ratio of 240:1 thus turning the interrupter shaft at 7.5 rpm. The motor operates from a 115-volt 60-cycle source.

1.02 It will be first used in 806E ringing power plants.

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 Requirements and associated procedures marked with an asterisk (*) need not be checked during maintenance unless the apparatus or part is made accessible for other reasons, or its performance indicates that such a check is advisable.

2. REQUIREMENTS

2.01 Lubrication: The motor is equipped with double felt sealed ball bearings which do not require relubrication. An enclosed gear train with phosphor bronze bearings, furnished as part of the motor, requires annual lubrication with KS-6232 light mineral oil. Three oil holes are located on the side of the motor adjacent to the cam shaft. Depending on the mounting position of the motor, only two are used and the third is sealed with a screw. Add oil in the uppermost hole until it overflows out either of the other two holes.

2.02 The interrupter shaft bearing is a graphite oilless type and should not be lubricated.

*2.03 Freedom of Rotating Parts

(a) The bumper pin rollers shall turn freely on the pins and there shall be no flat spots worn on the rollers. Gauge by eye and feel.

(b) Later models will be equipped with nylon cams and followers on which wear is expected to be negligible.

*2.04 Noise and vibration of the interrupter assembly shall not be excessive. Gauge by sound and by feel.

2.05 Interrupter Springs and Contacts

(a) Contacts shall be clean and smooth.

(b) Spring assemblies shall be tight.

(c) Make contacts shall have visible follow.

(d) The point of contact shall fall entirely within the circumference of the opposing contact disc.

Note: The timing of the spring contacts is expressed on the charts in revolutions of the motor high-speed shaft. It is convenient to use this shaft since it gives a vernier adjustment due to the reduction gear. The crank, furnished with the interrupter, should be threaded on in a counterclockwise direction and should be removed immediately after completing the adjustments, as the machine must not be operated with the crank in place.

2.06 The interrupter timing and tolerances shall be in accordance with the timing charts for lists 1 and 4, lists 2 and 5, and lists 3 and 6, and the following unless otherwise specified on the circuit drawing. Front contacts are contacts which are closed by the action of the bumper pin rollers or nylon cams on the wiper springs.

Lists 1 and 4

(a) Initial closure of springs 1 to 5 shall occur simultaneously within ± 3 revolutions of the high-speed shaft.

(b) Closed period of spring 6 shall not overlap the preceding or following closures of springs 1 to 5 by more than 1-1/2 revolutions.

SECTION 163-631-701

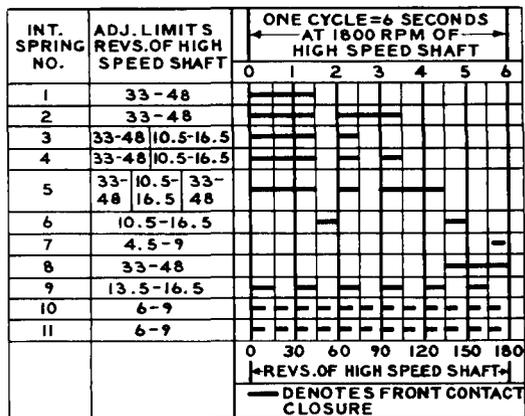


Fig. 1 - Interrupter Timing KS-15509, List 1 and List 4

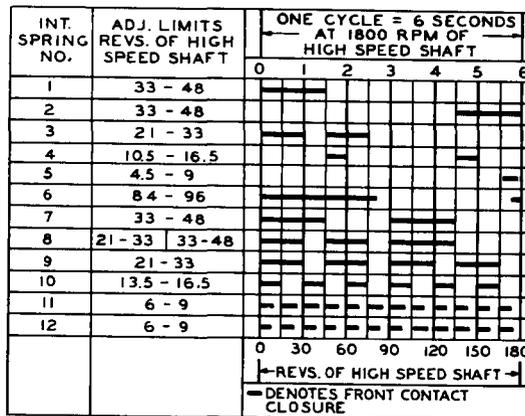


Fig. 2 - Interrupter Timing KS-15509, List 2 and List 5

(c) Spring 7 closure shall end from 4-1/2 revolutions before to 3 revolutions after the start of the earliest of any immediately following closures of springs 1 to 5.

(d) During the operation of springs 1, 2, 7, 8, and 11, the wiper spring shall touch neither the upper nor lower springs for at least 1-1/4 revolutions, but one spring shall close within 3 revolutions after the opening of the other.

(e) Wiper springs of springs 9 and 10 may make simultaneously with both upper and lower springs for a maximum of one revolution.

Lists 2 and 5

(a) Initial closures of springs 7, 8, and 9 shall occur simultaneously within ± 3 revolutions of the high-speed shaft.

(b) Spring 5 closure shall end from 4-1/2 revolutions before to 3 revolutions after the start of the earliest of any immediately following closures of springs 7, 8, and 9. In addition, the final closure of spring 9 shall not overlap the beginning of spring 5 closure.

(c) During the operation of springs 1, 2, 3, 5, 6, and 12, the wiper spring shall touch neither

upper nor lower springs for at least 1-1/4 revolutions but one spring shall close within 3 revolutions after the opening of the other.

(d) Spring 6 shall transfer during nonoperate periods of spring 9.

(e) Wiper springs of springs 10 and 11 may make simultaneously with both upper and lower springs for a maximum of one revolution.

Lists 3 and 6

(a) Initial closure of springs 1 to 10 shall occur simultaneously within ± 3 revolutions of the high-speed shaft.

(b) Closed period of spring 12 shall not overlap preceding or following closures of springs 1 to 10 by more than 1-1/2 revolutions.

(c) Spring 13 closure shall end before closure of spring 11 begins.

(d) During the operation of springs 13 and 15, the wiper spring shall touch neither upper nor lower springs for at least 1-1/4 revolutions, but one spring shall close within 3 revolutions after the opening of the other.

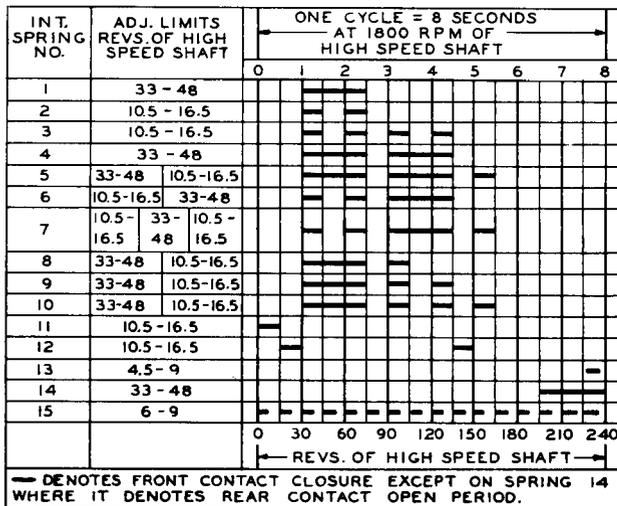


Fig. 3 - Interrupter Timing KS-15509,
List 3 and List 6

3. ADJUSTING PROCEDURES

3.001 List of Tools and Materials (Equivalentents may be substituted)

Tools

Adjuster, Spring, 507A Tool
Burnisher, contact, No. 265C
Pliers, duck-bill
Screwdriver, cabinet, 3"
Test Set, 81A (buzzer)
Tool, No. 43
Crank (furnished with machine)

Materials

Cloth, cleaning, Twill Jean, D-98063
KS-6232 light mineral oil
Spirits, Petroleum

3.01 Lubrication (Rq. 2.01). After oiling gear case, wipe off excess oil.

3.02 Interrupter Shaft Bearing. Wipe off any graphite dust near bearing using dry cloth.

*3.03 Freedom of Rotating Parts

(1) Bumper pin rollers that are flat or have been oiled should be replaced. If rollers are sticking but have not been oiled, they can be removed and the pin cleaned with a cloth

and petroleum spirits. The pin should be allowed to dry before replacing the roller, as both petroleum spirits and oil are detrimental to these rollers.

(2) Recheck interrupter timing after any change in interrupter bearings or bumper pin rollers.

(3) Construction using nylon cams and followers should require no maintenance on these parts.

*3.04 Noise and Vibration (Rq. 2.04):
Where excessive noise or vibration is present, see that all bolts, nuts, and screws are tight. If noise or vibration is due to the motor or gear train, return the motor to the manufacturer for repair.

3.05 Low-speed Interrupter Springs and Contacts (Rq. 2.05).

3.06 Timing and Tolerances (Rq. 2.06).

(1) Tighten spring assembly screws with a screwdriver, as necessary. Timing of interrupter springs must be rechecked after tightening of spring assembly screws.

(2) The contacts may be smoothed by using a contact burnisher and then wiping with a clean cloth. If the contacts are in bad condition or if the contact springs are badly bent, they shall be replaced. Shape contact springs that are slightly bent or out of adjustment with a pair of duck-bill pliers or spring adjuster.

(3) The springs may be adjusted by shaping. This adjustment may be determined by using a buzzer test set or equivalent such as a tester's receiver or indicating lamp, connected across the contacts. Check the intervals by counting the number of revolutions of the motor high-speed shaft while turning it by hand with the crank. The timing of each spring assembly should be checked for a complete revolution of the associated bumper wheel or cam.