

KS-5777 MOTOR AND KS-5778 SPEED REGULATOR REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-5777 motor, manufactured by the John Oster Manufacturing Company, and the KS-5778 speed regulator, manufactured by Lee Manufacturing and Engineering Company, as applied initially in the Tape-Reeler in No. 1 automatic message accounting centers.

1.02 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.

1.03 Requirements and associated procedures marked with a number sign (#) need not be checked by the installer unless it is thought that the requirement is not being met or performance indicates that such a check is advisable.

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 performance indicates that such a check is advisable.

1.05 Successful commutation may be said to have been obtained if neither the brushes nor the commutator is burned or injured to the extent that abnormal maintenance is required. The presence of some visible sparking is not necessarily evidence of unsuccessful commutation.

1.06 Normal operation may be defined as a condition in which the motor is carrying any load from no-load to full load, with the voltage at the motor terminals not exceeding 121 volts, AC.

2. REQUIREMENTS

#2.01 Lubrication

(a) The bearings shall be relubricated with Andok C grease after every three years of service, when being put into service after one or more years of storage, or after having been dismantled for other reasons.

#2.02 The bearings shall be free from excessive wear. If the motor operates satisfactorily under normal operation with 2.03, 2.05, 2.06, and 2.11 met, the bearings shall be considered to be in satisfactory condition.

Note: Abnormal noise from a ball bearing is an indication of excessive wear.

*#2.03 Freedom of Rotation: The armature shall turn freely in its bearings. Gauge by feel.

*2.04 There shall be no end play.

2.05 Noise and vibration of the motor shall not be excessive under any normal operating condition. Gauge by sound and feel.

*#2.06 The speed of the motor, under load, is controlled by a rheostat, connected in one of the input leads. Under no-load conditions it is limited by the speed regulator, which is mounted on the intermediate shaft in the gear train through which the motor drives the reel spindle. See local job information.

#2.07 Commutator and Collector Rings

(a) The commutator of the motor and the collector rings of the speed regulator shall be clean, smooth, and free from pitting or other deformation except that caused by normal wear. Eccentricity in the commutator shall not be enough to cause poor operation.

(b) The commutator shall have no high, low, or loose segments, or flat spots. The mica between the segments shall be undercut.

#2.08 Commutation: The motor shall commute successfully under all conditions of normal operation. Gauge by eye.

2.09 Brushes

#(a) The minimum length of the motor brushes shall be 1/4".

#(b) The minimum length of the speed regulator brushes shall be such that that part of the brush, measured from the shoulder, which remains within the brush holder when the rotating element is in place on the shaft shall be at least as long as that part which extends beyond the holder.

(c) Brushes shall not bind in their holders, nor shall they be loose enough to cause poor commutation.

(d) The contact faces of the motor brushes shall be fitted to the surface of the commutator. The arc of contact shall be approximately 100% and the area of contact shall be minimum, 50%.

(e) Brush pressure shall be adequate to give successful commutation. Gauge by eye.

#2.10 The contact surfaces of the speed regulator contacts shall be clean and free from buildups which might interfere with satisfactory operation.

*#2.11 The temperature of the surface of the motor shall not exceed 90C (194F), maximum. If it is thought to be excessive, measure by thermometer.

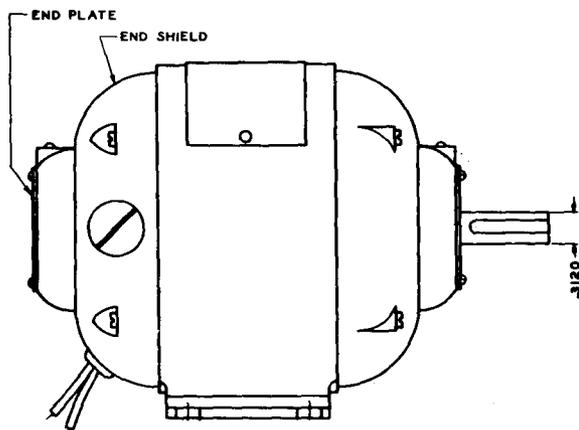


Fig. 1 - KS-5777 Motor

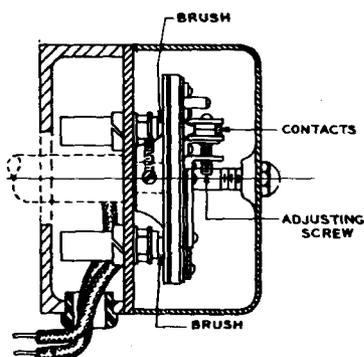


Fig. 2 - KS-5778 Speed Regulator



Fig. 3 - Schematic Circuit

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges, and Materials (Equivalents may be substituted)

Tools

- Burnisher, No. 265C
- Hammer, ball peen, 1 lb.
- Puller, Owatonna Tool Co.,
Grip-O-Matic, No. 1000-1/2/L
- Screwdriver, 3-1/2", KS-6854
- Stick, orange, KS-6320

Gauges

- Thermometer, R-1032, Detail 1

Materials

- Cloth, cleaning, KS-14666
- Grease, Andok C
- Pad, felt
- Paper, cleaning, KS-7187
- Sandpaper, 4/0
- Spirits, petroleum

#3.01 Lubrication (Rq. 2.01)

(1) To relubricate a bearing, remove the end plate, observing the position of the spring washer, if present. Wipe away accessible grease with a clean cloth and remove any hardened grease with an orange stick. Apply fresh grease around the balls, filling the space between the inner and outer ball rings nearly full of grease. Fill the bearing chamber if any, not more than one-third full of grease. Replace the plate, taking care that the spring washer is in its proper place.

#3.02 Bearings (Rq. 2.02)

(1) Replace all worn bearings. Proceed by first removing the brushes if present and then the end shield, which is retained by four screws. This will expose the bearing, which will have a slip fit in the end shield and a light press fit on the shaft. With the puller, remove the bearing. Clean the bearing housing, washers, spring washer and the shaft with a cloth and petroleum spirits. Give the bearing housing and shaft a light coating of grease before installing the new bearing. When placing the new bearing on the shaft avoid putting any pressure on the outer ball ring. It is suggested that a clean pipe or tube, having an internal diameter slightly greater than the diameter of the shaft, be obtained. Slip this over the shaft with the end in contact with the inner ball ring and tap it with the hammer, as required, to seat the bearing. Reassemble the motor, taking care that the washers, including the spring washer, are re-

turned to their original positions. See that the brushes are clean and returned to their holders as originally located.

***#3.03 Freedom of Rotation (Rq. 2.03)**

(1) Remove any foreign objects which might interfere with rotation. Look for brushes which are binding and for damaged bearings. Tighten loose screws.

***3.04 End Play (Rq. 2.04)**

(1) If end play is found, inspect the spring washer which is located in the shaft extension end of the motor. Replace it if damaged.

3.05 Noise and Vibration (Rq. 2.05)

(1) See that all screws, including mounting screws, are drawn up tightly. Check the alignment and mesh of the gear on the motor shaft with the first driven gear in the associated equipment.

***#3.06 Speed (Rq. 2.06)**

(1) If the desired speed can not be attained under load, look for high resistance contacts in the supply circuit, or trouble in the associated rheostat. Check the speed regulator.

(2) To adjust the speed regulator to increase speed, turn the adjusting screw clockwise.

#3.07 Commutator and Collector Rings (Rq. 2.07)

(1) A bronze color and high polish are very desirable on a commutator. A commutator in this condition, which is smooth and giving successful commutation, should be left alone. This appearance should not be mistaken for that of a burned commutator, which is a dead black in color.

(2) If oily, the commutator or collector rings should be cleaned, with the brushes removed, by rubbing with a cleaning cloth moistened in petroleum spirits, followed by polishing with a dry cloth.

(3) If the commutator shows tarnished spots after cleaning, or has become slightly roughened, it should be smoothed with sandpaper. Remove the armature (See 3.01) from the machine and apply the sandpaper cut in a band of the correct width to fit the commutator, by hand. Rotate the armature to insure even removal of material, so as not to render the commutator eccentric.

(4) If loose, high or low segments, flat or rough spots, or serious eccentricity appear on the commutator it will be necessary to remove the armature for repairs or replacement, in which case the matter should be referred to the supervisor.

(5) In general, the undercutting given to the mica in a commutator is sufficient until the commutator itself requires turning down, but a commutator which has run for a long time without having been turned, should be checked for mica appearing above the bars. For turning and resurfacing information see Section 171-110-801.

(6) If the collector rings on the speed regulator are slightly roughened they may be smoothed with sandpaper wrapped around a convenient flat stick. If badly roughened or worn the entire rotating element should be replaced.

#3.08 Commutation (Rq. 2.08)

(1) If the commutation is not successful, see that 2.07 and 2.09 are met.

Note: Slight visible sparking is not necessarily an indication of unsatisfactory commutation.

3.09 Brushes (Rq. 2.09)

#(1) Replace short brushes.

(2) If a brush binds in its holder see that both the brush and the holder are clean. If the brush fits too tightly, reduce the edges by rubbing with sandpaper. When handling the brushes, mark them and return them to the same holder and in the same position in the holder as they were before removal. Replace brushes which are too loose in their holders.

#(3) To fit the contact surface of a brush to the commutator, shape the surface by the use of a grinding wheel having a diameter approximating that of the commutator. Where such a wheel is not available use sandpaper on a cylinder of the appropriate diameter. Wipe the brushes clean of dust. Be sure that there is contact at each end of the arc of contact and run the motor for an hour or more at no-load, before applying the usual load.

#(4) If necessary, file the ends of new speed regulator brushes slightly so that they rest squarely on the collector rings.

(5) Brush pressure of commutator brushes will usually be adequate if, with the brush holder removed and

the end of the brush resting against the commutator, the spring projects $3/4$ ", minimum, beyond the holder. Similarly speed regulator brushes should extend beyond their holders $3/4$ " additional when the regulator is removed from the shaft. As required, stretch the spring to increase its length.

#3.10 Speed Regulator Contacts (Rq. 2.10)

- (1) To clean the contacts insert a strip of cleaning paper between

them, holding them together as the paper is withdrawn. To smooth, use the burnisher in a similar manner.

*#3.11 Temperature (Rq. 2.11)

- (1) Hold the bulb of the thermometer against the hottest spot on the outside of the motor, covering that part of the bulb not in contact with the motor with a piece of felt or the equivalent, and observe the highest temperature indicated.