KS-5748 MOTOR

REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-5748 motor manufactured by General Electric Company. This motor is intended for the KS-13834-01 Perforator for the Automatic Trouble Recorder.

1.02 This section is reissued to add reference to KS-7471 grease and to generally update and improve the format of the section. This reissue does not affect the Equipment Test List.

1.03 Reference should 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 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. (See Section 171-110-701.)

1.05 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 input plug between the limits of 45 volts and 52 volts dc.

1.06 The motor is adjusted at the factory to meet the following requirement for speed:

Minimum: 1500 rpm, 45 volts, full load, motor cold

Maximum: 2100 rpm, 52 volts, no load, motor hot

An adjustable resistor, mounted under a cover near the bottom of the motor, furnishes a means for field adjustment over a range of 150 rpm above and below the factory adjustment.

1.07 The rotation of the motor is counterclockwise when the end opposite the shaft extension is viewed.

2. REQUIREMENTS

2.01 ***Lubrication:*** Bearings should be relubricated with Andok C ◗or KS-7471◖ grease after every 3 years of service, when placed into service after one or more years of storage, or dismantled for other reasons.

2.02 ***Bearings:*** The bearings should be free from execessive wear. If the motor operates satisfactorily under normal operation with the requirements in 2.03, 2.04, 2.05, and 2.09 met, the bearings shall be considered to be in satisfactory condition.

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

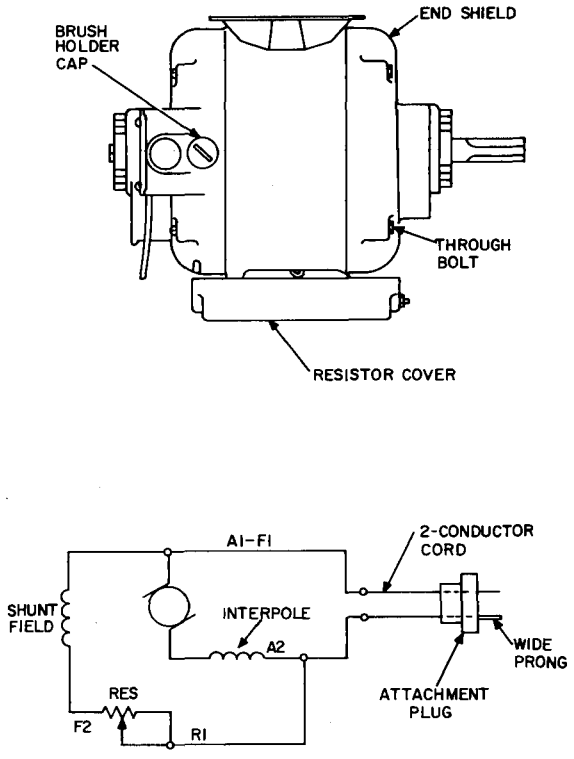

Fig. 1—KS-5748 Motor and Schematic Circuit

2.03 ***Freedom of Rotation:*** The armature shall turn freely in its bearings.

Gauge by feel.

2.04 ***Noise and Vibration:*** Noise and vibration of the motor shall not be excessive under any normal operating condition.

Gauge by sound and feel.

2.05 ***Speed:*** The speed of the motor should meet the requirements specified in local job information.

2.06 ***Commutator:*** The condition of the commutator shall be as follows.

(a) The commutator 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.

2.07 ***Commutation:*** The motor shall commutate successfully under all conditions of normal operation.

Gauge by eye.

2.08 ***Brushes:*** The condition of the brushes shall be as follows.

(a) The minimum length of the brushes shall be 3/8 inch.

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

(c) The contact faces of the brushes shall be fitted to the surface of the commutator. The arc of contact should be approximately 100 percent and the area of contact should be 50 percent, minimum.

(d) Brush pressure shall be adequate to give successful commutation.

Gauge by eye.

2.09 ***Temperature:*** The temperature should not exceed:

Frame—95°C (203°F) maximum

Bearings—80°C (176°F) maximum

If the temperature is thought to be excessive, measure by thermometer.

◗***Note:*** Temperature sensing labels may be used in lieu of a thermometer if desired (see Section 171-116-301.).◖

3. ADJUSTING PROCEDURES

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

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
—	Hammer, ball peen, 1-lb
—	Puller, Owatonna Tool Co. No. 1000 1/2L, or No. 1001, as available
KS-6854	Screwdriver, 3-1/2 inch
—	Screwdriver, 4 inch regular
KS-6320	Stick, orange
—	Wrench, No. 417A Tool
GAUGES	
R-1032	Thermometer, Detail 1
MATERIALS	
D-98063	Cloth, cleaning, twill-jean
→KS-7471←	Grease or Andok C
—	Pad, felt
—	Sandpaper, 4/0
—	Spirits, petroleum

Note: KS-7471 Grease is available in 4 ounce tubes or in 1 or 5 pound cans (see Section 065-330-102).

3.01 ***Lubrication (Reqt. 2.01):*** When relubricating the bearings, proceed as follows.

(1) Remove and mark the brushes to enable their later return to the same holders.

(2) With the wrench and screwdriver, loosen and remove the through bolts.

(3) Remove the end shield at the end having the shaft extension.

(4) Remove the armature.

Note: The bearings will remain on the shaft.

(5) Remove the spring washer located in the bearing chamber at the commutator end and clean it with a cloth and petroleum spirits.

(6) Clean any spacing washers which may be found with a cloth and petroleum spirits.

(7) Clean the bearing chambers in the end shields with a cloth and petroleum spirits.

Caution: Care should be taken to avoid the introduction of dirt into the bearings, either from the tools or the surrounding air.

(8) Remove as much grease as practicable with an orange stick and then wipe with a cleaning cloth.

(9) Apply fresh grease around the balls, completely filling the space between the inner and outer ball rings.

(10) When relubricating a bearing in a motor which has been in storage for a year or more, proceed as follows.

(a) After cleaning but before applying the fresh grease, apply one or two drops of light mineral oil to the bearing.

(b) Rotate the outer ball ring manually to assist the oil to work into the bearing.

(c) Continue to rotate the bearing, if necessary, until it turns freely.

(d) Apply fresh grease as above.

Note: If the bearing cannot be made to turn freely, it should be replaced.

(11) Apply a light coating of grease to the washers and bearing housings.

(12) Replace the washers on the shaft in their original arrangement and install the armature.

(13) Tighten the through bolts and check for freedom of rotation.

(14) Return the brushes to their holders as originally located.

3.02 ***Bearings (Reqt 2.02):*** Replace all worn bearings as follows.

(1) Remove the armature per 3.01.

Note: The bearings are attached to the shaft by a light press fit.

(2) Use the puller to remove the bearings.

(3) Apply a light coating of grease to the shaft before installing the new bearing.

(4) Place the bearing on the shaft with the shield toward the armature.

Note: The balls and ball retainer should be visible when looking at the end of the shaft.

Caution: Avoid putting any pressure on the outer ball ring.

Note: 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 a hammer as required, to seat the bearing.

(5) Reassemble the motor (check that washers are returned to their original positions).

(6) Check that brushes are clean and returned to their original locations.

3.03 ***Freedom of Rotation (Reqt 2.03):*** Check for freedom of rotation as follows.

(1) Remove any foreign objects which could interfere with rotation.

(2) Check for brushes which are binding and for damaged bearings.

(3) Tighten loose screws.

3.04 ***Noise and Vibration (Reqt 2.04):*** Check for cause of noise and vibration as follows:

(1) Check that all screws, including mounting screws, are drawn up tightly.

(2) Check the bearings for wear.

3.05 ***Speed (Reqt. 2.05):*** Adjust the speed of the motor by varying the resistance of the adjustable resistor as follows.

(1) Remove the resistor cover from the motor frame.

(2) Using a small screwdriver, loosen the screw holding the band around the resistor.

(3) Slide the band along the resistor as required.

(4) Tighten band screw.

(5) Replace resistor cover.

3.06 ***Commutator (Reqt 2.06):*** Check the commutator as follows.

(a) 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 not be tampered with.

Note: This appearance should not be mistaken for that of a burned commutator, dead black in color.

(b) If oily, the commutator should be cleaned as follows.

(1) Rub the commutator with a cleaning cloth moistened with petroleum spirits.

(2) Polish the commutator with a clean cloth.

(c) If the commutator shows tarnished spots after cleaning, or has become slightly roughened, it should be smoothed with sandpaper as follows.

(1) Remove the armature per 3.01.

(2) Cut the sandpaper in a band of the correct width to fit the commutator.

(3) Apply the sandpaper by hand to the armature.

(4) Rotate the armature to insure even removal of material, so as not to render the commutator eccentric.

(d) If loose, high or low segments, flat or rough spots, or serious eccentricity appear on the commutator, it should be removed for repair or replacement, in which case the matter should be referred to the supervisor.

(e) 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.

3.07 ***Commutation (Reqt 2.07):*** If the commutation is not successful, see that 2.06 and 2.08 are met.

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

3.08 ***Brushes (Reqt 2.08):*** Check brushes as follows.

(a) Replace short brushes.

(b) 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 fine sandpaper. Replace brushes which are too loose in their holders.

(c) To fit the contact surface of a brush to the commutator proceed as follows.

(1) Shape the surface by the use of a grinding wheel having a diameter approximating that of the commutator.

(2) Where such a wheel is not available, use sandpaper on a cylinder of the appropriate diameter.

(3) Wipe the brushes clean of dust.

(4) Check that there is contact at each end of the arc of contact.

(5) Run the motor for an hour or more at no load before applying the usual load.

(d) Brush pressure will usually be adequate if, with the brush holder cap removed and the end of the brush resting against the commutator, the spring projects 1/2 inch minimum, beyond the holder. If necessary, untwist the brush shunt or stretch the spring to increase its length.

3.09 ***Temperature (Reqt 2.09):*** Check the temperature of the motor as follows.

(1) Hold the bulb of the thermometer against the hottest spot on the outside of the motor frame or bearing housing.

(2) Cover the part of the bulb not in contact with the motor with a piece of felt (or equivalent). Make sure none of the felt comes between the thermometer bulb and the surface to be checked. If this should happen, the felt would act as a thermal insulator and improper readings would be obtained.

(3) Compare indicated temperatures to maximum temperatures allowed.