KS-15632 DYNAMOTOR
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-15632 dynamotor.

1.02 The KS-15632 dynamotor will be used first in type "O" carrier installations.

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 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.

1.05 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.

1.06 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.

1.07 When doing work of such a nature that the sudden starting of the machine by automatic means might result in injury to the person or damage to the equipment, the d-c fuse should be removed.

2. REQUIREMENTS

#2.01 Lubrication: Ball bearings shall be cleaned and repacked with fresh 260-300P grease every 3 years while in service, or before being put into service after the motor has been in storage a year or more. The bearings shall be free from excessive wear. If the machine operates satisfactorily under all conditions of normal operation and with requirements 2.02, 2.03, and 2.10 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-15632 DYNAMOTOR

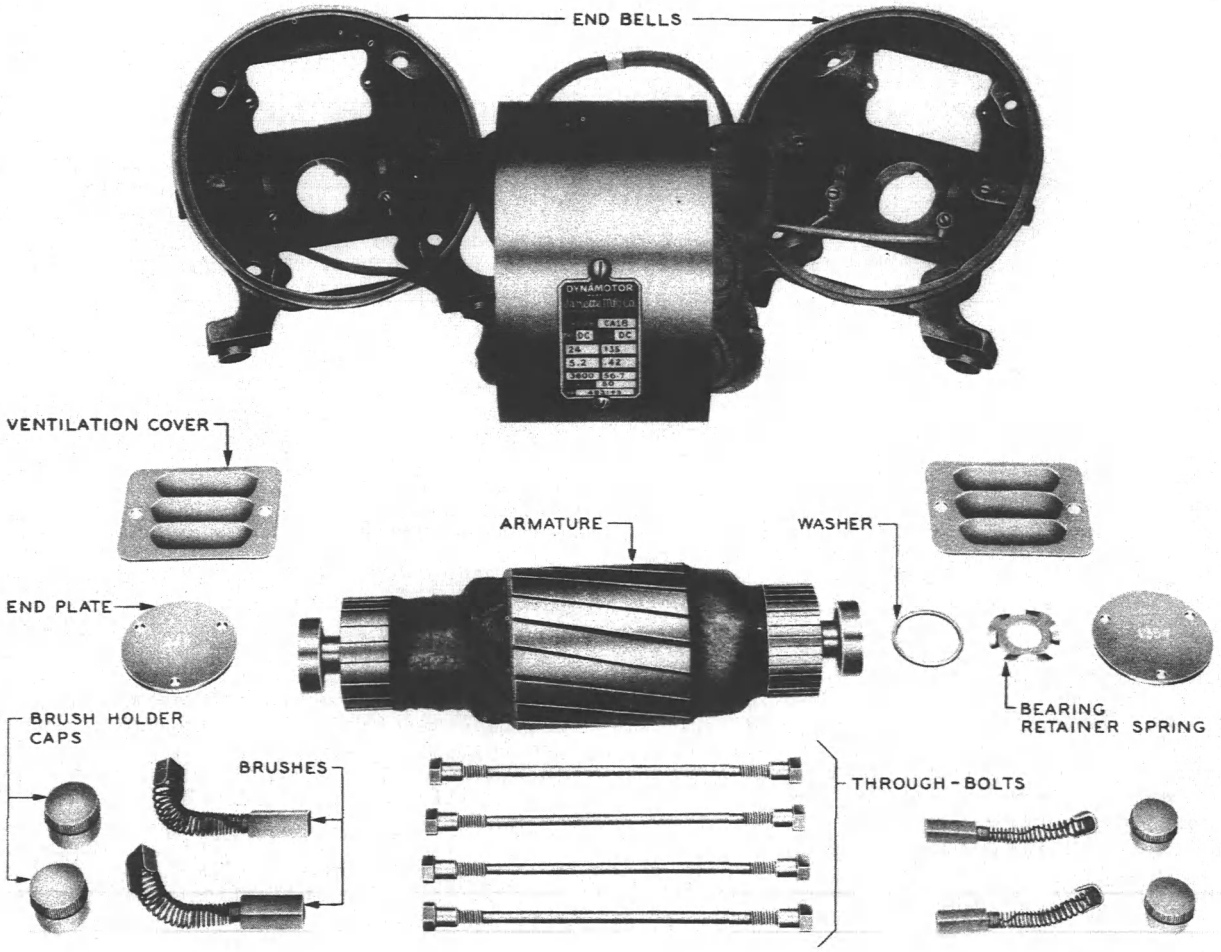

FIG. 2 - KS-15632 DYNAMOTOR

2.02 Freedom of Rotation: The shaft shall rotate freely in its bearings. Gauge by feel.

2.03 The noise and vibration of the machine under any normal operating condition shall not be excessive. Gauge by sound and feel.

*#2.04 Speed: The speed depends on the input voltage and the load, and is not adjustable. The rated full load is stamped on the nameplate.

2.05 Voltage: The output voltage depends on the input voltage and the load, and is not adjustable. The rated output voltage is stamped on the nameplate.

*#2.06 Current: The input and output currents shall be as shown below:

	Current (Amps)	
	Input	Output
No load	2.7 min.	0
Full load	5.2 max.	0.42 max.

#2.07 Commutators

(a) Commutators shall be clean, smooth, and free from scoring, pitting, or other deformation except that caused by normal wear. The eccentricity shall not be enough to cause poor operation. Gauge by eye.

(b) Commutators shall have no high, low, or loose segments, or flat spots. The mica between the segments shall not project above the bars. Gauge by eye.

2.08 Commutation: Without altering the position of the brushes, the machine shall commutate successfully under all conditions of normal operation. Gauge by eye.

2.09 Brushes

#(a) The length of the commutator brushes shall be no less than 3/8". Gauge by eye.

(b) Brushes shall not bind in their holders, neither shall they be loose enough to cause poor commutation. Gauge by eye.

#(c) Contact surfaces of brushes shall be fitted to the surface of the commutator. Gauge by eye.

(d) There are no specific requirements for brush pressure; however, the pressure shall be sufficient to produce successful operation and may be gauged in a general way by observing the condition of the surface of the commutator.

(e) The clearance between the lower edge of the brush holders and the commutator surface shall be:

Min. 1/32" Max. 5/64"

*#2.10 Temperature: The temperature shall not exceed:

	Max.
Bearings	80C (176F)
Windings and Frame	90C (194F)

If the temperature is thought to be excessive, measure by thermometer. Do not use the fingers to estimate temperature.

3. ADJUSTING PROCEDURES

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

Tools

Bellows, hand, 10"
Pliers, P-long nose, 6-1/2"
Polisher, commutator, locally prepared
Puller, Owatonna Tool Co., Grip-O-Matic No. 1000-1/2L
Screwdriver, 3-1/2", KS-6854
Screwdriver, 3" cabinet
Stick, orange, KS-6320
Wrench, socket, 3/8" Hex, #46 tool

Gauges

Ammeter, D-C, Weston Model 280, Range 30-3-1.5 Amps.
Indicator, speed, Jones 5B, Hasler or locally prepared stroboscopic lamp
Scale, steel 6", R-8550
Thermometer, R-1032, Detail 1
Voltmeter, D-C, Weston Model 280, Range 150-60-3 Volts

Materials

Cloth, cleaning, twill-jean, D-98063
Grease, 260-300 P
Pad, felt
Sandpaper, 4/0
Spirits, petroleum

#3.01 Lubrication (Rq. 2.01)

(1) To relubricate a bearing covered by an end plate, remove the plate, observing the position of the bearing retainer spring and washer. Wipe away accessible grease with a clean cloth, and with an orange stick, remove all hardened grease. Apply fresh grease around the balls, filling the space between the inner and outer ball rings flush with the sides of the rings. Fill the bearing chamber, if any, not more than one-third full of grease and replace the plate, taking care that the bearing retainer spring and washer are in their proper places between the outer ball ring and the end plate. (See Fig. 2.)

(2) Replace all worn bearings.

(3) To replace a worn bearing, disassemble the machine as follows after disconnecting all leads.

(a) Remove the ventilation covers.

(b) Remove the end plates.

(c) Remove the bearing retainer spring and washer on the 135V. end noting the position of each.

(d) Remove the four brush holder caps and brushes taking care to mark each.

(e) Remove the four through-bolts.

(f) Carefully remove the end bells (if necessary, tap gently) and note the position of the brush leads.

(g) Remove the armature.

(4) Remove the worn bearing and replace with new bearing. Use the bearing puller if necessary.

(5) Reassemble the machine in the reverse order to that shown in (3) above. Check rotation of the armature by hand before replacing ventilation covers. Replace the ventilation covers with the openings facing downward. Reconnect all leads and test for normal operation.

3.02 Freedom of Rotation (Rq. 2.02)
Remove any foreign objects which might interfere with rotation. Tighten loose bolts and look for binding brushes and worn bearings.

3.03 Noise and Vibration (Rq. 2.03)

(1) See that all set screws and bolts are drawn up firmly.

(2) Look for worn bearings.

*#3.04 Speed (Rq. 2.04)

(1) If the speed of the machine is not at nameplate value or higher, check the supply voltage, freedom of rotation, the condition of the brushes, and the commutator.

(2) To measure speed with a speed indicator, remove the end plate from the 24V. end to obtain access to the end of the shaft.

3.05 Voltage (Rq. 2.05)

(1) If the output voltage at full load of 0.42 Amps. is not between 115 and 145 volts, check for general cleanliness and inspect the commutators, brushes, speed, and electrical connections.

*#3.06 Current (Rq. 2.06)

Insert the ammeter in series with one of the 24V. or 135V. leads and read current.

#3.07 Commutators (Rq. 2.07)

(1) A bronze colored, highly polished commutator is very desirable and should not be mistaken for a burned commutator. A commutator in this condition, which is smooth and giving satisfactory commutation, should be left alone.

(2) If oily, the commutators should be cleaned, with the machine stopped, by rubbing with a cleaning cloth moistened with petroleum spirits, followed by a dry cloth. After being so cleaned, they may be polished, with the machine running, by the use of a commutator polisher.

(3) The polisher should be made up locally and consists of a hardwood stick covered at one end for approximately 3" with several layers (three or four are suggested) of hard-woven canvas or duck (8 oz.) suitably secured with a rivet or bolt. The following approximate dimensions are suggested. Length 10", width 1/2", thickness 3/16". They may be modified as found convenient. See Fig. 3. The polisher is applied "end on" with heavy pressure to remove surface deposits and to produce a polish on the surface of the metal. When the outer layers become too dirty for effective use, they can be cut away, successively, near the cord binding and removed.

(4) If the commutators show tarnished spots after cleaning and polishing, they should be smoothed with sandpaper.

(5) Never allow commutators to become more than slightly rough before

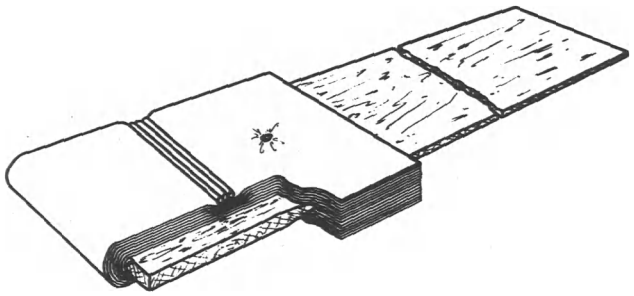

Fig. 3 - Typical Commutator Polisher

endeavoring to correct the condition with sandpaper. The sandpaper should be folded, sanded side out, on a wooden block shaped to fit the surface of the commutator. Before sanding a commutator, mark and remove the associated brushes.

(6) After sanding the commutators, their surfaces and the windings should be cleaned with air or wiped with a clean cloth and the commutators polished. In replacing the brushes, see that they are clean and put back in the same holders and in the same position in which they were originally.

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

(8) 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 period without having been turned down, should be checked for mica projecting above the bars. For turning and resurfacing information, see Section 171-110-801.

3.08 Commutation (Rq. 2.08)

(1) If the commutation is not satisfactory, see that requirements 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 fine sandpaper. Replace brushes which are too loose in their holders.

#(3) To fit the contact surface of a brush to a commutator, cut a strip of 4/0 sandpaper slightly wider than the width of the brush and preferably as long as the circumference of the commutator. Place the strip of sandpaper under the brush with the sanded side next to the brush and hold the paper so that it will bear on as much of the commutator surface as practicable. Draw the sandpaper under the brush until its contact surface has the same curvature as the commutator surface. The final cuts shall be made in the direction of rotation.

#(4) When the above procedure would be impracticable due to the construction of the machine, shape the brush contact surface to approximate the curvature required to assure contact at each end of the arc of contact and run the machine for an hour or more at no load. Where a grinding wheel of approximately the diameter of the commutator is not available for shaping brushes, 4/0 sandpaper on a cylinder of approximately the same diameter may be used.

#(5) After fitting, remove the brushes and clean the commutator and the windings with air and wipe the brushes and the commutator surfaces with a cloth.

#(6) If brush pressure is insufficient, replace springs.

*#3.10 Temperature (Rq. 2.10)

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

(2) The temperature of the windings or the machine frame may be measured in a similar manner with the machine stopped when required for safety. If the temperature exceeds the specified limits, see that all requirements are met.