TYPES K AND KG MOTORS

INSTRUCTIONS

Construction

Westinghouse Types K and KG Motors are series wound, direct-current, designed for crane and hoist service. They are equally suitable for other classes of intermittent service where the load is frequently started, stopped or reversed.

Types K and KG Motors are of simple construction, with few parts, all of which are readily accessible. Frames Nos. 1 to 3 are of cast iron, and Nos. 4 to 10 are of cast steel; all are split diagonally. The brushes being permanently set in the neutral position, these motors will operate equally well in either direction; this makes them particularly suitable for reversing service.

Operating Suggestions

In offering the following suggestions, it is desired to assist in still further improving the service now given by the Types K and KG Motors now installed. Westinghouse representatives welcome the opportunity of discussing operating problems.

Field Coils—The field coils are thoroughly insulated. Each coil is impregnated by a vacuum process. Field coils should be kept clean, dry and free from oil. The accumulation of dust or dirt is often the cause of grounded coils. The motor should be blown out occasionally by compressed air or a hand bellows. At infrequent intervals, the coils should be wiped clean and dry and given a coat of good insulating varnish, which will appreciably lengthen their life. When reassembling the field coils in the frame, always check to see that connections have been properly made to give alternate polarity.

Armature and Armature Coils—The armature is built with open slots. The armature core and the commutator are mounted on a cast iron spider, constituting a unit from which the shaft can be removed.

The armature coils, which are made from copper wire or copper strap, are fully formed and insulated before they are placed in the armature slots. Such construction makes the coil a unit in itself.

The life of armature coils can be lengthened by keeping the armature free from the accumulation of dust, dirt, oil or moisture. If oil or grease appears on the windings, it is probably drawn from the bearing housings on account of some trouble with the oil throwers in the housings. Locate the trouble and correct it, as the life of the insulation is shortened by soaking in oil.

Commutator and Brushes—The commutator consists of bars of hard-drawn copper, insulated by the best quality of mica. The V-rings are made of malleable iron or steel and insulated from the bars by hot-formed mica V-rings. The bars

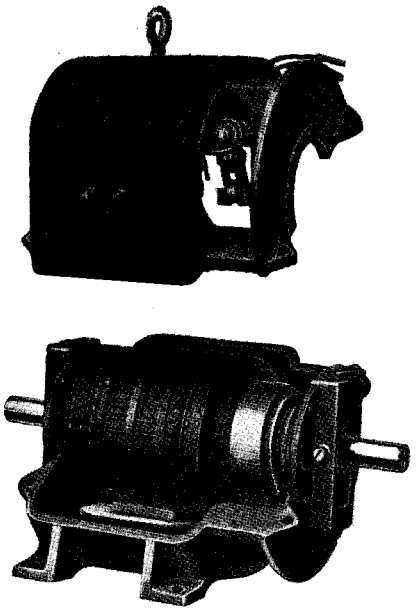

FIG. 1—TYPE K MOTOR, FRAME OPENED

are assembled, and clamped between the V-rings. The assembled commutator is pressed and baked.

While the motors will operate with any good grade of carbon brush, those furnished by Westinghouse are recommended. Before making any changes in the grade of brushes, discuss your problem with our representative.

The commutator must be kept clean and the brushes properly adjusted and fitted to the commutator. Wipe the commutator at frequent intervals with a piece of clean canvas cloth free from lint. A commutator that is taking on a polish and shows no signs of wear requires no other attention. A rough raw copper-colored commutator surface should be smoothed with a piece of sandpaper or sandstone ground to fit, and polished with No. 00 sandpaper. When using the paper or stone, lift the brushes and do not replace them until all the grit is removed. Never use emery cloth or paper on the commutator.

Commutator failures may be due to:

(1) Oil or dust (particularly dust containing metal particles) on the surface of the commutator, or at the end of the bars on the mica V-rings. Keep the V-rings at the end of the bars clean.

(2) Defects in the armature winding may injure the commutator by causing excessive sparking or heating, or by causing excessive voltage between bars, resulting in injury to the mica between such bars.

Shafts—The shafts are turned from the best axle steel obtainable. All shafts must be pressed out from the commutator end towards the rear end.

Bearing Housings—The bearing housings are made of cast iron. Grease lubrication is standard on frames Nos. 1 to 8 inclusive, while oil and waste lubrication is used on frames Nos. 9 and 10.

Bearings—Most bearings are interchangeable for both ends of the motor. In frames Nos. 1, 2, 9 and 10, the pinion end bearing is longer than the commutator end bearing. In all frames, the bearings are solid sleeves held in place by a set screw in frames Nos. 1 to 8, and by a key in frames Nos. 9 and 10. Bearings for frames Nos. 1 to 7 are of cast brass, and for frames Nos. 8 to 10 are of cast iron, babbitted. A shoulder on the bearing rests against a machined surface of the bearing housing, taking the armature end thrust.

To remove the bearing from the housing: (1) Withdraw the set screw. (2) Press the bearing out, applying pressure on the outer end of the bearing.

Worn bearings should be replaced before there is any danger of the armature striking the poles. Expensive repairs may become necessary if further wear of the bearings is permitted. It is advisable to have spare bearings on hand.

Excessive wear and overheating of bearings can usually be traced to one or more of the following causes:

(1) Defective gears.
(2) Poor lubrication.
(3) Poor alignment.
(4) Rough bearing surface.
(5) Bent shaft.

Poor lubrication may be caused by a lubricant of poor grade or insufficient quantity. Bearing surfaces and lubricant should be entirely free from dirt and grit.

Poor alignment may result from a poor foundation. Make certain that the motor rests on a level, rigid foundation and that all holding-down bolts and foundation bolts are drawn tightly.

Rough bearing surface is usually the result of one of the above mentioned causes. True up and polish the shaft in a lathe, refit the bearings, and refill with a fresh supply of lubricant.

In case of a **bent shaft,** installation of a new one is recommended. It is very difficult to straighten a bent shaft and such a course should not be attempted except in emergency cases, and then only by skilled workmen.

General Maintenance

In general, keep the motors clean and dry. Tools, bolts, oil cans, etc., must not be allowed to lie loose around the motor or on the frame. Inspect bearings, windings, commutator, etc., regularly. Replace worn parts by duplicate parts obtained from the original manufacturer.

Standardize motor equipment by using as few different frames as will satisfactorily meet load requirements.

*To be filed as an Instruction Leaflet and as Renewal Parts Data; for Renewal Parts Data, see reverse side of this sheet.

TYPES K AND KG MOTORS

RENEWAL PARTS DATA

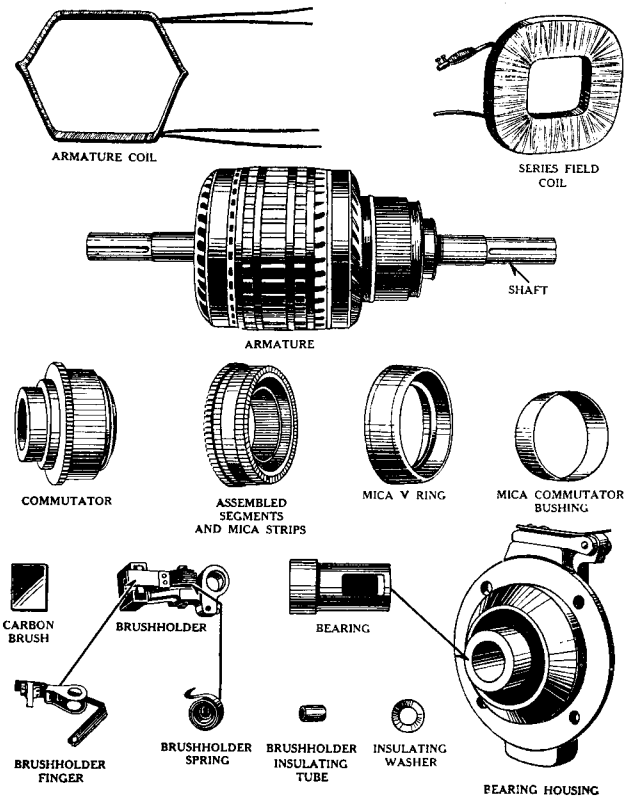

FIG. 2—TYPICAL RENEWAL PARTS FOR TYPES K AND KG MOTORS

The parts obtained from the motor manufacturer are uniform in size and quality, and are designed especially for these motors, insuring maximum efficienoy and longest life. **They fit.** This is very important, as the saving in time when making a replacement reduces the greater cost of a repair—loss of production.

Anticipate replacements not only by keeping wearing parts on hand, but also by making renewals, as may be determined by regular inspection, before actual interruption of service occurs. Expensive repairs may often be prevented by renewing an inexpensive part before it has worn sufficiently to cause other damage.

Carry an adequate stock of wearing parts

This stock is an inexpensive operating insurance and will lower maintenance costs by reducing loss of production.

For Types K and KG Motors, keep a few bearings, brushes and armature coils on hand at all times. Users having many motors installed will find it advisable to stock other parts, such as brushholders, field coils and armatures.

RECOMMENDED STOCK OF RENEWAL PARTS

For Motors in use up to and Including	1	5	
Name of Part	No. Per Motor	Recommended For Stock	
Armature complete	1	0	1
Armature coil	1 set	1/3 set	2/3 set
Cut winding insulation (1 set) Class 1	1 set	1/3 set	2/3 set
Shaft complete with keys	1	0	0
Commutator complete	1	0	0
Assembled Segments—Slotted	1 set	0	1
Mica V ring—front	1	1	2
Mica V ring—rear	1	1	2
Field coil—series	4	0	0
Brush	1 set	1 set	2 set
Brushholder	1 set	0	1
Brushholder spring	1 set	1	2
Brushholder pressure finger	1 set	0	1
Bearing	2	1	2

Parts indented are included in the part under which they are indented.

This is a list of the Renewal Parts and the quantities of each that we recommend should be stocked by the user of this apparatus to minimize interrupted operation caused by breakdowns. The parts recommended are those most subject to wear in normal operation or those subject to damage or breakage due to possible abnormal conditions.

This list of Renewal Parts is given only as a guide. When continuous operation is a primary consideration, additional insurance against shutdowns is desirable. Under such conditions more renewal parts should be carried, the amount depending upon the severity of the service and the time required to secure renewals.

ORDERING INSTRUCTIONS

Name the part and give the complete name plate reading. State whether shipment is desired by express, freight or by parcel post. Send all orders or correspondence to nearest sales office of the Company. Small orders should be combined so as to amount to a value of at least one dollar, as order-handling and shipping expenses prevent us from billing a smaller amount.

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Westinghouse Electric & Manufacturing Company

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