KS-5559 GEAR MOTOR
REVERSIBLE AC TYPE
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-5559 gear motor manufactured by Holtzer-Cabot Division, Eicor, Inc, or Borg Equipment Division.

1.02 This section is reissued to add information for KS-5559, Lists 5 and 6 motors, and to delete the KS-5559, List 2 motor, and to make other revisions and additions. Detailed reasons for reissue will be found at the end of the section.

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 ***Phi*** **(ϕ):** Requirements are marked with a phi when they are not required to be checked before turnover.

1.05 ***Asterisk*** **(*):** Requirements are marked with an asterisk when to check for them would necessitate dismantling or dismounting of apparatus, or would affect the adjustment involved, or other adjustments. No check need be made for these requirements unless the apparatus or part is made accessible for other reasons, or its performance indicates that such a check is advisable.

1.06 Lists 1 and 6 have sleeve bearings and both halves of a multijaw coupling (Fig. 1); list 3 has ball bearings (Fig. 2); lists 4 and 5 have sleeve bearings, a sprocket on the shaft extension, and oil pipes (Fig. 3). All list numbers include a capacitor.

1.07 ***Caution: No attempt should be made to turn the motor output shaft, as the gears are liable to strip. If power continues to be applied to the motor when the low speed shaft hits a stop, the gears may strip.***

2. REQUIREMENTS

2.01 ***Lubrication***

Eicor Motors (KS-5559, List 1)

(a) Annually, and at installation, add KS-6232 light mineral oil in the two oil holes on the top of the motor until the oil overflows. Wipe off excess oil.

ϕ(b) Every 3 years, repack the gear case with 310-330P grease.

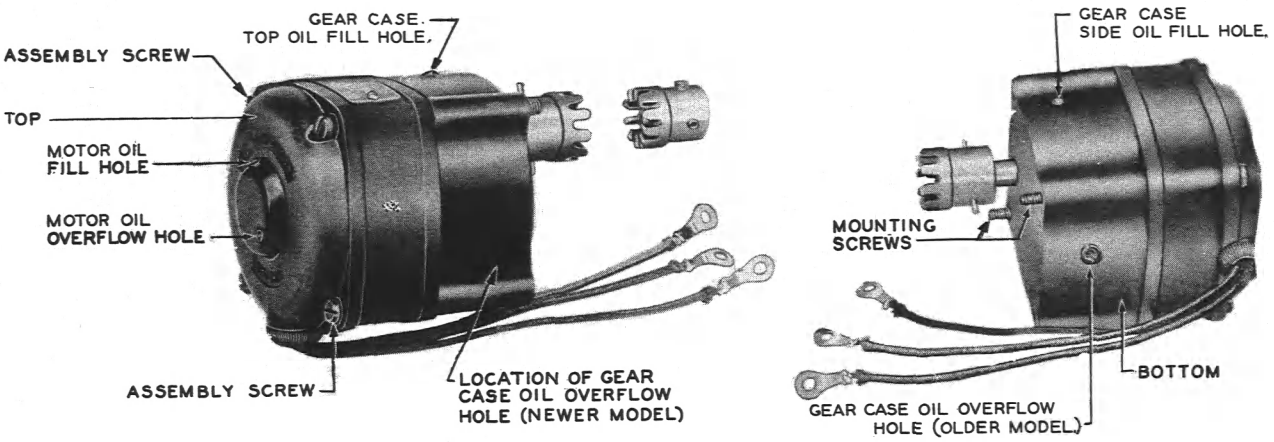


Fig. 1 – KS-5559, Lists 1 and 6 Motor (Holtzer-Cabot Shown)

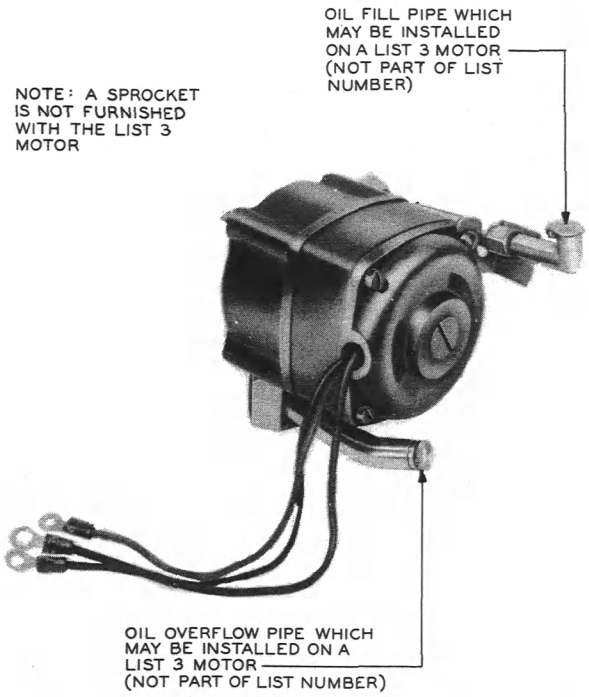


Fig. 2 – List 3 Holtzer-Cabot Motor Modified by Pipes Attached to Oil Fill and Overflow Holes in Gear Case

→ **Holtzer-Cabot and Borg Motors**

(c) ***Gear Case:*** At installation and annually thereafter, add KS-6232 light mineral oil through the oil hole in the gear case until oil comes out the overflow hole in the bottom for older models or on the side near the bottom on newer models. In some cases, the oil hole and overflow hole are equipped with external fill and drain pipes.

(d) ***Sleeve Bearings:*** At installation and annually thereafter, add KS-6232 light mineral oil through the oil hole on the top of the motor bearing at the end opposite the drive shaft until oil appears at the overflow hole.

Note: The motor bearing adjacent to the gear box is lubricated with oil from the gear box.

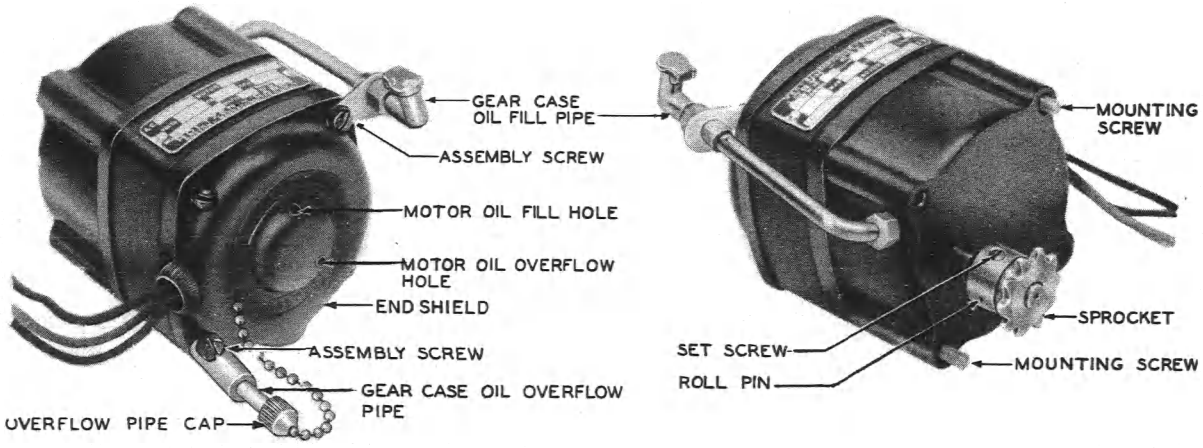
(e) Unsealed ball bearings shall be relubricated with 260-300P grease every 3 years in service. These bearings shall be relubricated when being put into service after 1 or more years of storage or after having been dismantled for other reasons.

Note: In order to determine which type of ball bearing the motor is equipped with, the end shield will have to be removed.

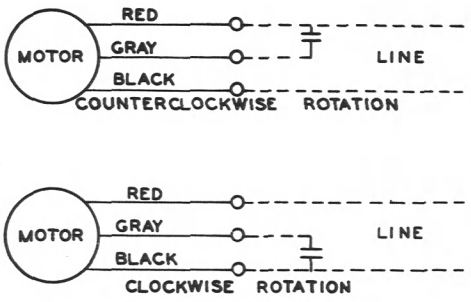
ϕ(f) Double-sealed bearings shall not be relubricated, but shall be run until noisy and then replaced.

2.02** ***Electrical Connections

(a) The electrical connection shall be as shown on the connection diagrams in Fig. 4 for the direction of rotation and power service voltage used.



→ **Fig. 3 – KS-5559, Lists 4 and 5 Motor (Holtzer-Cabot Shown)**



NOTE: ROTATION INDICATED LOOKING AT END OF MOTOR OPPOSITE SHAFT EXTENSION.

Fig. 4 – Connection Diagrams

2.03 ***Noise and Vibration***

(a) The motor and gears shall be quiet.

(b) There shall be practically no vibration due to unbalance.

Gauge by sound and feel.

2.04** ***Alignment

When Motors Equipped With Coupling Are Mounted in Associated Equipment

(a) The teeth shall mesh easily.

Gauge by feel.

(b) The teeth of each coupling half shall not bottom on the other coupling half.

Gauge by eye.

(c) The motor output shaft shall be closely in line with the shaft of the driven equipment.

Motors Equipped With a Sprocket Gear

(d) The motor shall drive the chain smoothly and without binding.

Gauge by eye.

2.05** ***Temperature

(a) The temperature of the motor frame shall not exceed 95C.

Use the Kimble thermometer.

Caution: Under trouble conditions, the unit temperature may exceed that shown above. Do not use fingers to estimate temperature.

If the temperature is thought to be excessive, check as follows. Hold the bulb of the thermometer against the upper part of the motor frame, using a piece of felt or the equivalent to cover that part of the bulb which does not touch the frame. Observe the highest temperature indicated after it has stabilized.

3. ADJUSTING PROCEDURES

3.001 ***List of Tools, Gauges, and Materials***

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
563A	90-degree Offset Screwdriver
KS-6320	Orange Stick
R-2670	Allen Socket Screw Wrench (furnished with lists 1 and 6 motors)
—	4-inch Regular Screwdriver
GAUGES	
KS-14510, List 1	Volt-ohm-milliammeter
R-1032, Detail 1	Thermometer
MATERIALS	(See Sections 065-330-101 and 065-370-101)
KS-6232	Light Mineral Oil
KS-7860	Petroleum Spirits
KS-14666	Cleaning Cloth
—	Felt Pad
—	260-300P Grease
—	310-330P Grease
—	Oil-resisting Glyptol 1202 Varnish

3.002 When using petroleum spirits for cleaning purposes in the power room, provide as much ventilation as practicable. After using the petroleum spirits, the commutators of all dc machines in the power room should be burnished in accordance with approved procedures for the machines involved, since the fumes from the petroleum spirits may soften commutator film and thus adversely affect commutation.

3.01 ***Lubrication*** (Rq 2.01)

Eicor Motors (KS-5559, List 1)

(1) This motor is equipped with porous sleeve bearings. The two oil holes on the top of the motor are covered with machine screws. A screw cap closes an inspection port in the top of the gear case. The cap and screws should be kept in place, except when lubricating, to prevent dust and dirt from being wiped into the holes during cleaning. No overflow or drain holes are provided.

(2) To regrease the gear case, it is necessary to disassemble the motor.

(a) Disconnect the motor leads and remove the mounting screws, using the 4-inch regular screwdriver, to free the motor from its associated equipment.

(b) Remove the assembly screws which will give complete access to the inside of the motor and gear case.

(c) Oil will usually be found on the motor windings and inside the motor frame. This should have no harmful effect on the winding insulation, which is impervious to oil.

(d) The grease on the gears and any oil that is readily accessible should be wiped off. If gummy or hardened grease is found, remove with petroleum spirits and repack with grease to about two-thirds full.

(e) Reassemble the motor, using Glyptol to seal the joint between the gear case and frame, fill the oil holes with light mineral oil, and remount the motor. (See 3.04.)

→ **Holtzer-Cabot and Borg Motors**

(3) ***Gear Case:*** The gear case is shipped with screws in the oil holes. If there is a screw in the overflow hole (Fig. 1), it should be removed before putting the motor in service. Either the hole on the side near the top or on the top should be used for a filling hole.

(4) In some cases where space is limited, use an offset screwdriver to remove screws. A screw should be kept in whatever hole is selected as the oil fill hole and should be removed only when oiling. Keeping the fill hole covered prevents dirt and dust from being wiped into the hole during cleaning and then washed into the gear case when oiling.

(5) When oil holes in the gear case are furnished with pipes, remove the cap from the lower pipe, add oil in the upper pipe until it flows from the lower pipe, then replace cap on lower pipe.

(6) In cases where equipment is mounted below the motor, it is advisable to hold a cloth under the drain hole or pipe to prevent oil from leaking on equipment.

Note: When the motor is mounted in a rectifier and oil pipes are not furnished, the oil may continue to drip from the overflow hole for a time due to expansion as the temperature of the motor rises with rectifier heating.

(7) ***Sleeve Bearings:*** Sleeve bearings are of the wool-packed or felt-wick type. The motor bearing at the gear-case end is lubricated with oil from the gear case. The bearing at the end opposite the drive shaft should be oiled through the oil hole above the center. Excess oil should be wiped off. This excess may appear for a day or 2 after oiling.

(8) ***Ball Bearings:*** To clean and repack an open- or single-sealed ball bearing involves disassembling of the motor.

(a) Disconnect the motor leads and remove the mounting screws, using the 4-inch regular screwdriver, to free the motor from its associated equipment.

(b) Remove the assembly screws using the 4-inch regular screwdriver. Mark the caps and the frame so that the caps may be properly positioned when reassembling and pry the front cap and the back cap and gear case off. Care should be taken when removing the back cap with the gear case that the oil does not spill out and the gear case does not separate from the back cap.

(c) Remove all the end play washers and mark them or lay them out for replacement in the proper order.

(d) Wash the old grease out of the bearing chamber with petroleum spirits and, when dry, wipe the interior of the bearing chamber with a cloth moistened with light mineral oil.

(e) With a cloth, and, if necessary, an orange stick, remove all accessible grease from the exposed face of the bearing. Apply

fresh grease to the unsealed side, filling the space between the inner and outer ball rings about one-half full.

(f) Reassemble the motor in the reverse order, using Glyptol to seal the joint between the gear case and the back cap, if separated.

(g) If the gear case needs lubrication, lubricate it in accordance with 3.01(3) to (7), inclusive.

(h) Remount the motor in the equipment and reconnect the leads.

(9) When the motor is equipped with double-sealed bearings, replace the bearings as covered in Section 159-426-801.

3.02 ***Electrical Connections*** (Rq 2.02)

(1) A check of the connections should not be necessary after the motor has been correctly installed. An error in connections might account for failure to start, operation in the wrong direction, or excess heating. If the capacitor is open or short-circuited, it will account for failure of the motor to start.

3.03 ***Noise and Vibration*** (Rq 2.03)

(1) Where excessive noise or vibration is present, see that all mounting and assembly screws are tight and recheck alignment. (Rq 2.04.) If this does not clear the trouble, refer the matter to the supervisor, as the motor may have to be replaced.

3.04 ***Alignment*** (Rq 2.04)

When Motors Equipped With Couplings Are Mounted in Associated Equipment

(1) The alignment should be checked before starting to use the equipment. Loosen the Allen setscrews on the coupling half of the associated equipment.

(2) If the shafts appear to be in line and the coupling halves can be meshed easily, the alignment may be assumed to be satisfactory. If the shafts do not appear to be in line or the coupling halves do not mesh easily, loosen the motor mounting bolts (upper right- and lower left-hand) and correct the alignment by moving or shimming the motor. In unusual cases, it may be necessary to change the mounting of the associated equipment in order to secure satisfactory alignment.

(3) When satisfactory alignment has been obtained, mesh the coupling so that the teeth bottom. Then, separate the halves so that there is about 1/64-inch clearance between the teeth ends and the bottom of the grooves, and tighten the setscrews.

Motors Equipped With a Sprocket Gear

(4) In some cases, the motor is affixed to a mounting plate which in later models has slotted holes and leveling screws to enable proper alignment of the sprocket for the chain drive. For proper chain tension, see Sections 169-603-319 and 169-620-301.

3.05 ***Temperature*** (Rq 2.05)

(1) If the temperature exceeds the specified limits, check the motor supply voltage and check connections. (See 2.02.) If this does not clear the trouble, refer the matter to the supervisor, as the motor may have to be replaced.

REASONS FOR REISSUE

1. To add information for motors manufactured by Borg, a new supplier. 1.01, 2.01, and 3.01.
2. To revise checking requirements and symbols. 1.04, 1.05, 2.01(b), 2.01(f), 2.02, 2.04, 2.05, 3.04, and 3.05.
3. To add information for KS-5559, Lists 5 and 6 motors. 1.06, Fig. 1, and Fig. 3.
4. To delete information for the KS-5559, List 2 motor. 1.06 and Fig. 4.
5. To revise the requirements and procedures for temperature. 2.05 and 3.05.
6. To revise the list of tools, gauges, and materials. 3.001.
7. To add information covering the use of petroleum spirits. 3.002.
8. To detail the procedures for lubricating ball bearings. 3.01(8)(a),(b),(f),(g),(h), and 3.01(9).
9. To revise the procedure for noise and vibration by removing examination of motor information. 3.03(1) and former 3.03(2).
10. To add reference to sections covering proper chain tension for motors equipped with a sprocket gear. 3.04(4).