

## KS-5559 GEAR MOTOR REVERSIBLE AC TYPE REPLACEMENT PARTS AND PROCEDURES

### 1. GENERAL

**1.01** This section covers the information necessary for ordering parts to be used in the maintenance of the KS-5559 gear motors manufactured by Holtzer-Cabot Division or the Borg Equipment Division. It also covers the approved procedures for replacing these parts.

**1.02** This section is reissued to add KS-5559, List 5 gear motors manufactured by the Borg Equipment Division. Detailed reasons for reissue will be found at the end of the section.

**1.03** Part 2 of this section covers the various parts which it is practicable to replace in the field in the maintenance of the gear motor. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called Replacement Parts.

**1.04** Part 3 of this section covers the approved procedures for the replacement of the parts covered in Part 2. This information is called Replacement Procedures.

**1.05** *Caution: Gears may strip if any attempt should be made to turn the motor output shaft or if power continues to be applied to the motor when the low-speed shaft hits a stop.*

### 2. REPLACEMENT PARTS

**2.01** The figures included in this part show the various replacement parts in their proper relation to other parts of the apparatus together with their corresponding names and/or numbers.

**2.02** When ordering parts for replacement purposes, give the name, if given, of the part as shown in the figures of this section and also the complete nameplate data of the gear motor including the manufacturer's name and serial number and the KS and list number. For example, one output shaft and gear for Holtzer-Cabot, serial number 2581AC, 10 watts, 230 volts, 60 cycles, 6.5 rpm, 12.5 torque, KS-5559, List 5 gear motor. Do not refer to the section number or

any information in parentheses following part numbers.

**2.03** Miscellaneous parts, for example, screws, etc, which are not named in the illustrations and which cannot be obtained locally should be ordered by describing the part and giving the complete nameplate data as referred to in 2.02.

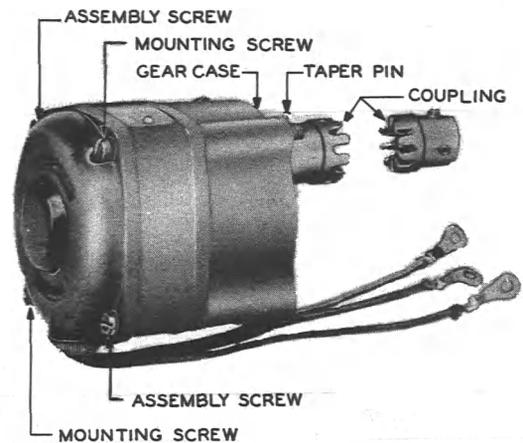


Fig. 1 - KS-5559, Lists 1 and 6 Motor (Holtzer-Cabot) (KS-5559, List 3 Same as Illustrated, Less Coupling)

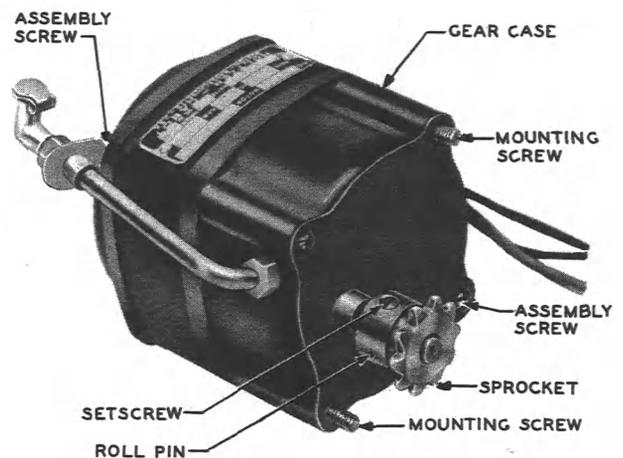


Fig. 2 - KS-5559, Lists 4 and 5 Motor (Holtzer-Cabot)

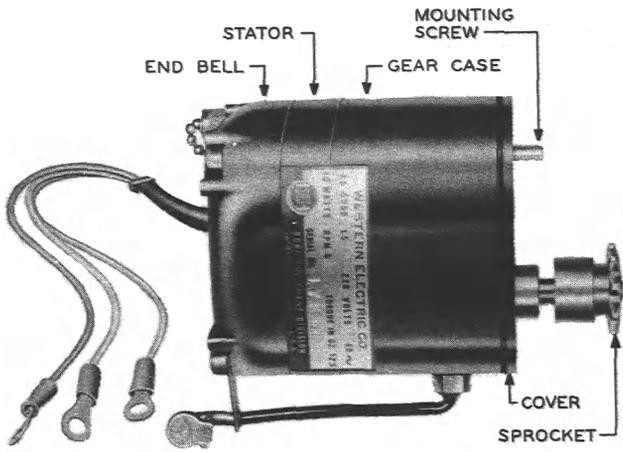


Fig. 3 - KS-5559, List 5 Motor (Borg)

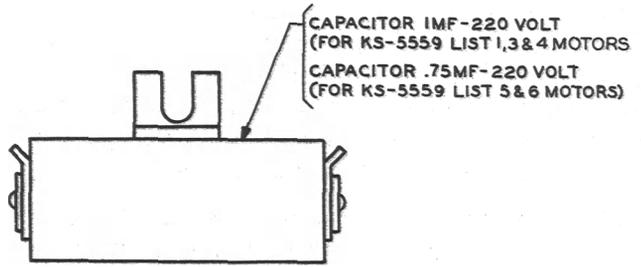


Fig. 4 - Capacitor

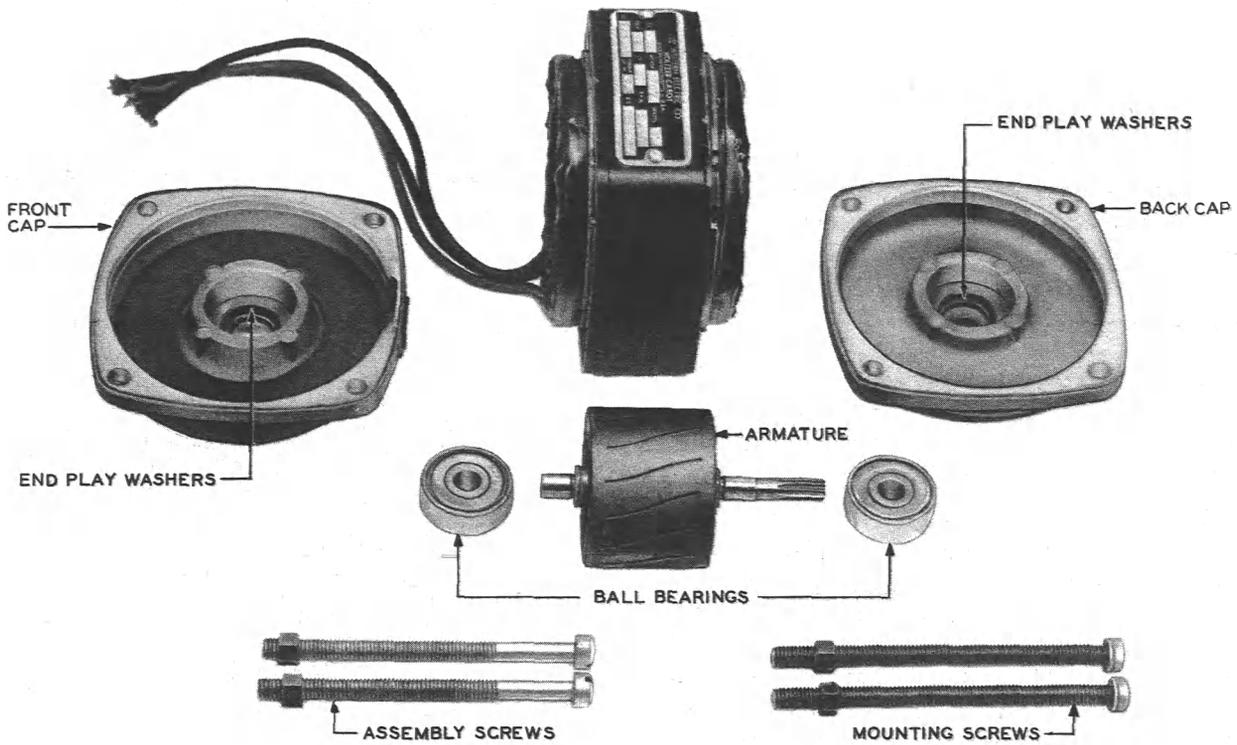


Fig. 5 - Ball-bearing Motor Parts (Holtzer-Cabot)

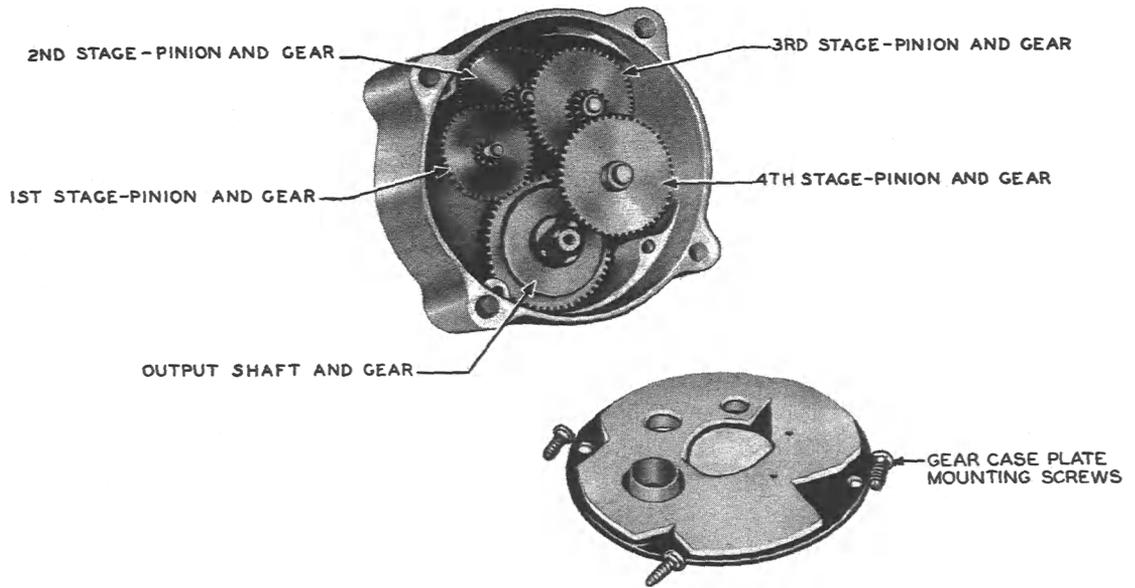


Fig. 6 - Gear Case (Holtzer-Cabot)

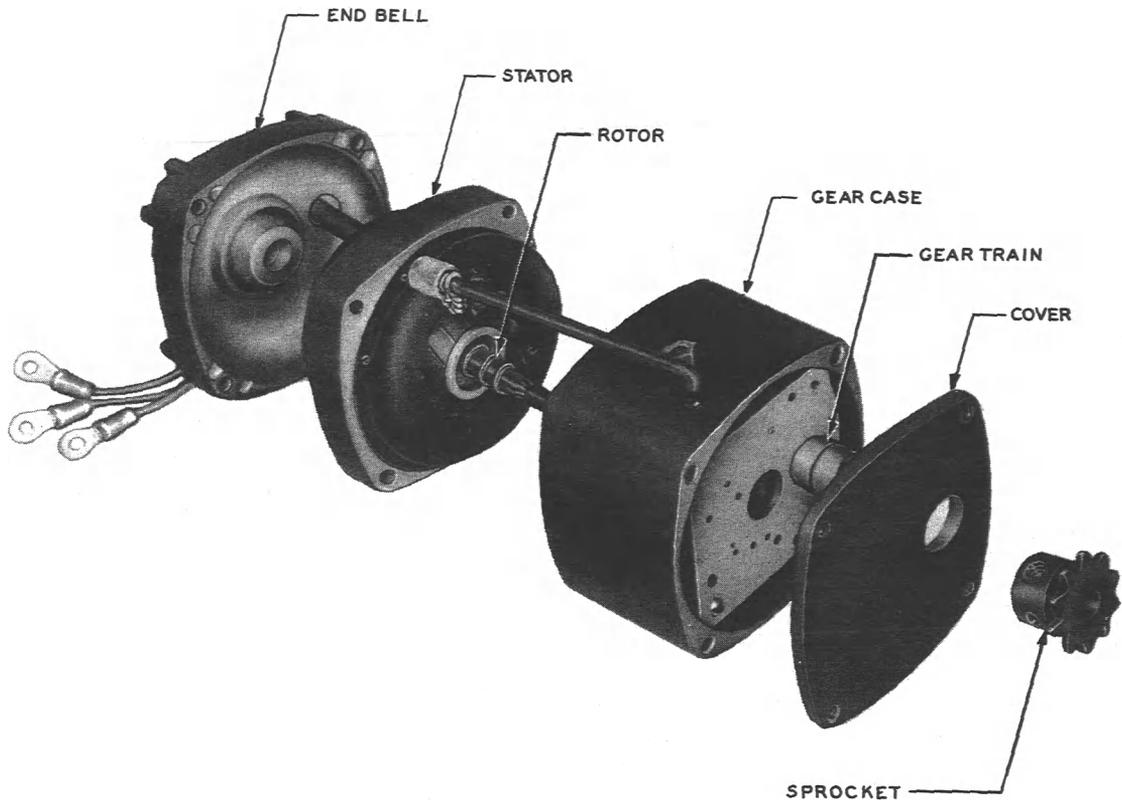


Fig. 7 - KS-5559, List 5 Gear Motor Parts (Borg)

**3. REPLACEMENT PROCEDURES****3.01 List of Tools and Materials**CODE OR  
SPEC NO.

DESCRIPTION

**TOOLS**

R-2670	Allen Socket Screw Wrench (furnished with KS-5559, Lists 1, 3, and 6)
—	3-inch Cabinet Screwdriver
—	1-pound Ball Peen Hammer
—	4-inch Regular Screwdriver
—	Puller, Grip-O-Matic, Owatonna Tool Co, No. 1002 Equipped With No. 1002-L1 Single End Arms
—	Bearing Pulling Attachment, Owatonna Tool Co, No. 950
—	1/16-inch Pin Punch, L.S. Starrett Co, No. 565 (or equivalent)

**MATERIALS** (See Sections 065-330-101 and 065-370-101)

KS-2423	Twill-Jean Cloth
KS-7860	Petroleum Spirits
—	Hardwood Block
—	Light Mineral Oil (90-110 S 100)
—	Glyptol 1202 Oil Resisting Varnish

**3.02** Remove the apparatus from service before making any replacements.

**3.03** After making any replacement of parts, the part or parts replaced shall meet the readjust requirements involved, as specified in Section 159-426-701. Other parts, whose adjustments may have been directly disturbed by the replacing operations, shall be checked to the readjust requirements and an over-all operation check shall be made of the motor before restoring it to service.

**3.04** 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.

**3.05** No replacement procedures are specified for screws, nuts, and other parts where the replacement consists of a simple operation.

**3.06 Ball Bearings, Armature, and End Play Washers (Holtzer-Cabot, List 3)**

(1) To replace these parts, disconnect the motor leads and remove the mounting screws, using the 4-inch regular screwdriver to free the motor from its associated equipment.

(2) 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.

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

(4) Wash the old grease out of the bearing chamber with a cloth moistened with light mineral oil.

(5) Remove the armature and if a new armature is required and the motor is a ball bearing type, use new ball bearings in view of possible damage to the old bearings in removing them from the shaft.

(6) Ball bearings may be removed, using the bearing puller and the bearing pulling attachment.

(7) The new ball bearing should have a light press fit on the shaft. Slip the ball bearing on the shaft, using a short piece of metal tubing having a smooth end which will push against the inner but not the outer ball race, and tap the ball bearing into place making certain that the ball bearing is tightly seated against the shoulder of the shaft. The new ball bearings are factory lubricated.

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

(9) If the gear case needs lubrication, lubricate it in accordance with Section 159-426-701.

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

**3.07 Sleeve Bearings:** If sleeve bearings need to be replaced, it will be necessary to replace the entire motor.

*Note:* The Holtzer-Cabot gear case on the old motor may be reused as a replacement part, provided it is in satisfactory condition.

**3.08 Taper Pin and Coupling (Holtzer-Cabot)**

(1) To replace these parts, disconnect the motor leads and loosen the mounting screws, using the 4-inch regular screwdriver to free the motor from its associated equipment.

(2) Support the coupling with a hardwood block to prevent injury to the output shaft or bearing; remove the taper pin using the pin punch and hammer and slide off the coupling. Slide the new coupling on the shaft. Line up the holes in the shaft and the coupling and assemble the new taper pin.

(3) To remove the coupling from the associated equipment, loosen the setscrews with the socket screw wrench and slide off the coupling. Slide the new coupling on the shaft and tighten the setscrews.

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

**3.09 Sprocket, Roll Pin, and Setscrew**

(1) To replace these parts, disconnect the motor leads and loosen the mounting screws, using the 4-inch regular screwdriver to free the motor from its associated equipment.

(2) Support the sprocket with a hardwood block to prevent injury to the output shaft and bearing, remove the roll pin using the pin punch and hammer or loosen the setscrews using the socket screw wrench. Remove the part to be replaced and substitute the new part.

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

**3.10 Gear Case, Pinion and Gear, and Output Shaft and Gear (Holtzer-Cabot)**

(1) To replace these parts, disconnect the motor leads and remove the mounting screws, using the 4-inch regular screwdriver to free the motor from its associated equipment.

(2) Remove the overflow and fill screws with a 3-inch cabinet screwdriver and drain the oil from the gear case. Where overflow pipes are provided, remove the overflow cap and drain the oil.

(3) Remove the coupling or sprocket as covered in 3.08 and 3.09, respectively.

(4) Remove the assembly screws with a 4-inch regular screwdriver. Mark the gear case and the back cap so that they may be properly positioned when reassembling and pry off the gear case with a screwdriver.

(5) Remove the gear case plate mounting screws using a 3-inch cabinet screwdriver, and remove the gear case plate. Note the position and arrangement of gears so that they may be reassembled in the same way.

(6) Remove the bushing on the end of the shaft of the first and second stage gears and disassemble the gears in the following order; first stage, third and fourth stages together, second stage, and output shaft and gear.

(7) The grease and oil on the gears should be wiped off. If gummy or hardened grease is found, remove with petroleum spirits.

(8) Replace the defective gear and reassemble the gear case in the reverse order, using Glyptol to seal the joint between the gear case and the back cap, if separated.

(9) Relubricate the gear case in accordance with Section 159-426-701.

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

**3.11 Gear Train (Borg):** Unlike the Holtzer-Cabot motors, pinions and gears of the Borg motors cannot be separately replaced. Procedures for replacing gear trains of the Borg motors are as follows:

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

- ↖ (2) Remove the overflow pipe cap and drain the oil from the gear case.
- (3) Remove the sprocket, as covered in 3.09, setting the roll pin aside for replacement of the sprocket.
- (4) Remove the two motor assembly screws and lift off the cover and cover gasket.
- (5) Remove the three screws holding the gear train to the gear case with the 3-inch cabinet screwdriver. Remove the gear train, noting the position of the gears in relation to the protruding oil pipe.
- (6) If gummy or hardened grease is found inside the gear case, remove with petroleum spirits.
- (7) Replace the gear train and reassemble, following procedures in reverse to those given above. If the end bell, stator, and gear case are separated, seal the joints with Glyptol.
- (8) Relubricate the gear case in accordance with Section 159-426-701.

- (9) Remount the motor in the equipment and
- reconnect the leads.

**REASONS FOR REISSUE**

1. To add motor manufactured by the Borg Equipment Division (1.01).
2. To rearrange the figures to include Fig. 3 and 7 of the Borg motor.
3. To remove manufacturer's catalog numbers of parts (2.02, Fig. 6).
4. To rearrange procedure information into separate steps (3.06, 3.08, 3.09, 3.10).
5. To change the intent on the re-use of Holtzer-Cabot gear cases which were formerly assembled to new motor parts (3.07).
6. To include procedures for replacement of gear cases (3.10).
7. To include procedure for draining oil on motors equipped with overflow pipes [3.10(2)].
8. To include procedure for removing coupling or sprocket [3.10(3)].
9. To add gear train (Borg) (3.11).