ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION
SERVICE DEPARTMENT

MAINTENANCE INSTRUCTION

APPLICATION OF CYPRINA-RA GREASE TO MOTOR ARMATURE BEARINGS

DESCRIPTION

This Maintenance Instruction presents important recommendations for the proper application of Cyprina-RA grease to armature bearings used on locomotive traction motors and drilling rig drive motors. The long service life expected of sealed grease bearings can be realized by carefully following the procedure given in this instruction. Precisely measured quantities of lubricant carefully applied with specially designed tools will produce a properly packed bearing. Cleanliness should prevail throughout all operations.

An understanding of how Cyprina-RA grease lubricates the bearings will emphasize the importance of following this procedure. Fundamentally Cyprina-RA lubricates in the following way:

1. When applied as recommended, oil bleeds into the required areas by contact with that area. Intimate cage and roller-end grease contact softens a small amount of grease, thus gradually releasing the oil lubricant.
2. Solidly packed grease within the contact arc forces the released oil into the bearing.
3. Proper quantities of grease spread on the roller cage assembly (I.D. and O.D.) prevent roller skidding and scuffing.
4. By purposely leaving a space free of grease at the top of the bearing cap and cover, churning and liquefaction is limited.
5. A sectionalized nylon insert is provided in the locomotive traction motor P.E. and C.E. bearing covers and the C.E. bearing cap which helps prevent premature oxidation and purging of the bearing grease.

Shell Cyprina-RA grease lubricant for traction motor armature bearings is available in two quantities: 8249819 for 35 pound pails and 8249820 for 120 pound drums. EMD recommends that customers discontinue use of any other grease formerly used.

MAINTENANCE

PREPARATION FOR GREASE APPLICATION

1. All assembly parts must be thoroughly cleaned of all foreign material and previous lubricant. All cleaning solution must be removed and the parts perfectly dried before applying grease. New or remanufactured bearings should be kept in their wrapping until ready for application of grease. The lubricant applied to these bearings when packaged is compatible with Cyprina-RA grease, therefore they need not be washed.
2. Cyprina-RA grease must be used exclusively and not mixed with other lubricants.
3. Adequate lubrication depends upon precise weight of grease as determined by an accurate scale. Too much grease is as detrimental to the service life of the bearing as too little. In

*This bulletin is revised and supersedes previous issues of this number.

production EMD uses a scale accurate to ± 1/4 ounce.

4. Cleanliness can be insured by obtaining grease direct from covered containers by use of a hand or motor driven pump, of a type that will not soften or harden (± 5 A.S.T.M. penetration) the grease during handling. If a pump is not used, extra precaution must be used to prevent contamination of the grease in the pail or drum. Grease should be handled on a clean piece of oil-proof paper.

5. Clean steel-bladed spatulas or putty knives should be used during intermediate handling of the grease and for packing the bearing parts. Limited use of bare hands will eliminate accidental inclusion of dirt or other contaminants.

6. Any C.E. and P.E. bearing covers and C.E. bearing caps not equipped with the nylon anti-churn insert can be converted to receive the insert as shown in Fig. 1.

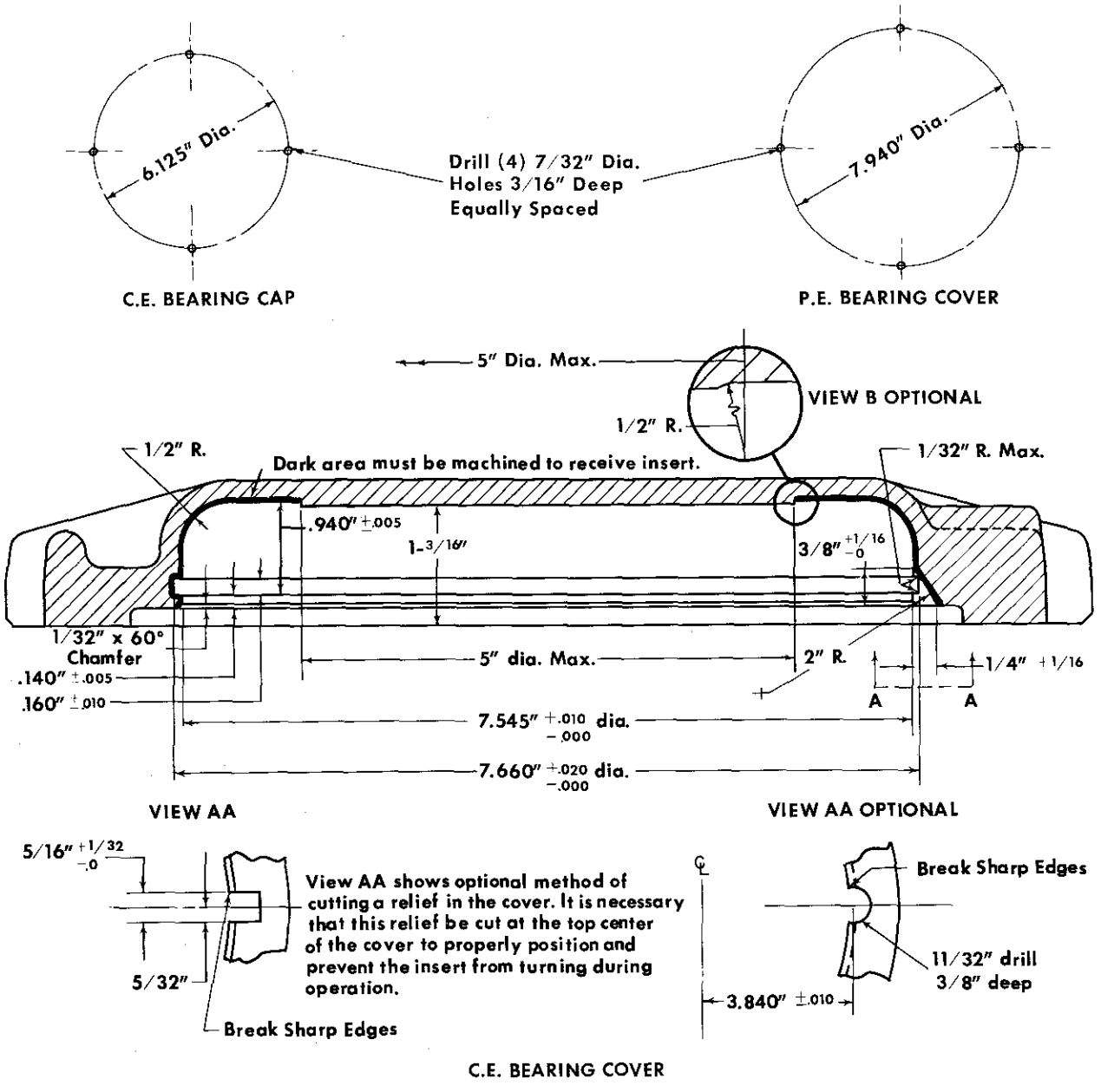

Fig. 1 — Anti-Churn Insert Modification

GREASE APPLICATION

When applying grease to the bearing components keep in mind the importance of using all the grease measured for each specific operation.

BEARING CAPS AND COVERS

1. After removing and thoroughly cleaning all parts, install a new anti-churn insert where applicable.

2. The labyrinth grooves in the bearing caps and the pinion end cover should be filled flush with grease, Fig. 2. This grease need not be measured.

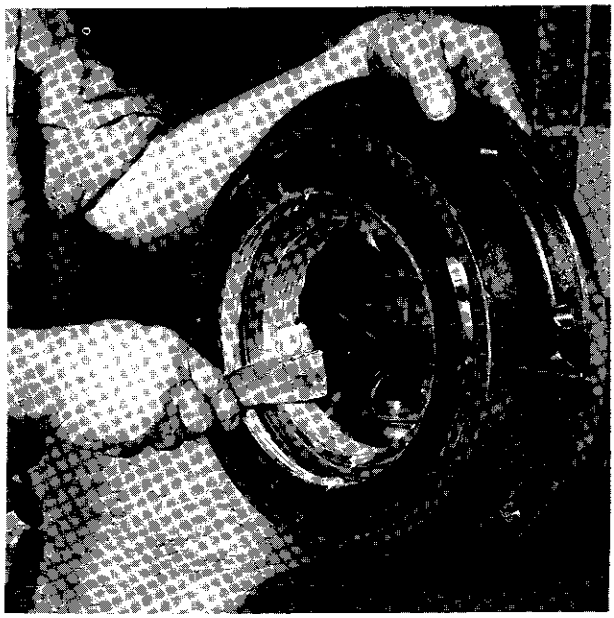

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Fig. 2 — Grease Application To Labyrinth Grooves

3. Weigh the piece of paper that will be used in handling the grease. This must be compensated for when weighing the grease.

4. Carefully weigh grease, Fig. 3, for the specified bearing to be packed. See Maintenance Data at the end of this M.I. for the proper quantity.

5. After weighing, use spatula or putty knife to apply grease to the cap or cover. Make sure it is packed under the lip or recessed sections without air voids.

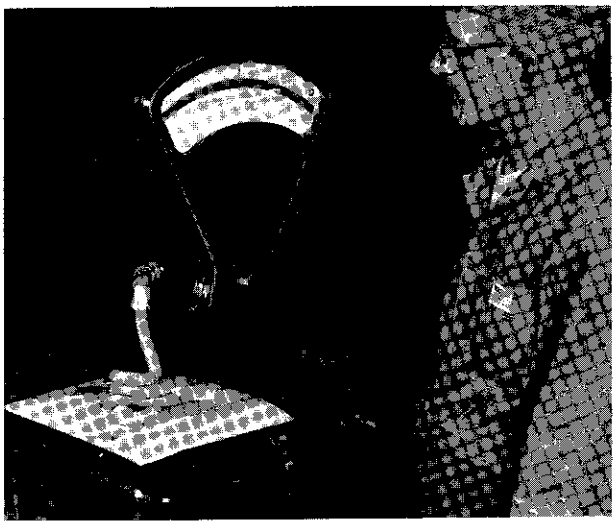

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Fig. 3 — Weighing Grease

6. Grease should be solidly packed only into the lower 200°-270° (depending on the parts and specified quantity) of the cap or cover keeping the ungreased portion at the top when motor is in operating position, Fig. 4. The bottom of caps and covers can be determined as follows:

   a. The C.E. bearing cover has a narrow drain slot at the bottom.

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Fig. 4 — Rough Application Of Grease To P.E. Cap

b. The P.E. bearing cover has a 3-1/4" drain slot at the bottom.

c. The C.E. and P.E. bearing caps have two drain holes at the bottom.

7. Using spatula, roughly form the grease into the approximate desired contour, Fig. 5, and apply correct grease mask as determined from the Maintenance Data at the end of this M.I.

8. Rotate grease mask to form proper contour, keeping it seated, Fig. 6. Several turns may be required. Use spatula to fill low spots with grease from mask blade.

9. The small amount of grease retained on the mask blade should be removed and applied to the ends of the grease arc. Fig. 7 shows the cross-section of grease arc applied to bearing. Fig. 8 illustrates properly packed P.E. and C.E. caps and covers.

ROLLER-CAGE ASSEMBLY

Demountable Cage Type

1. Remove roller-cage assembly from outer race and with spatula, work grease into O.D. of the roller-cage assembly, Fig. 9, coating the rollers and spreading grease into cage pockets.

2. Replace roller-cage in outer race, and work grease around I.D. of rollers and into cage pockets, Fig. 10.

Use full amount of grease specified for bearing.

CAUTION: In removing and replacing roller-cage assembly from outer race, assembly must be handled squarely to prevent gouging or deforming cage bars on outer race.

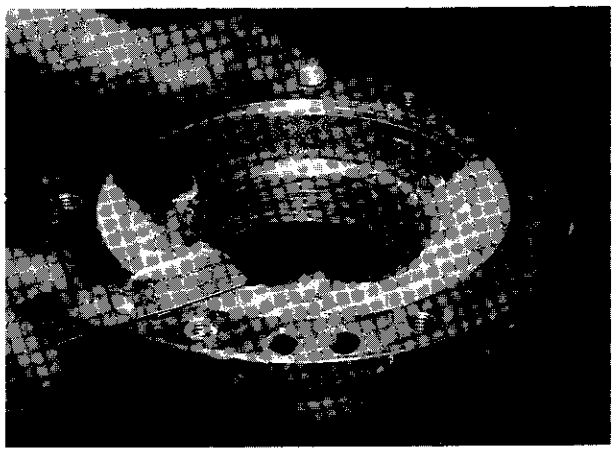

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Fig. 5 — Roughly Formed Grease Contour

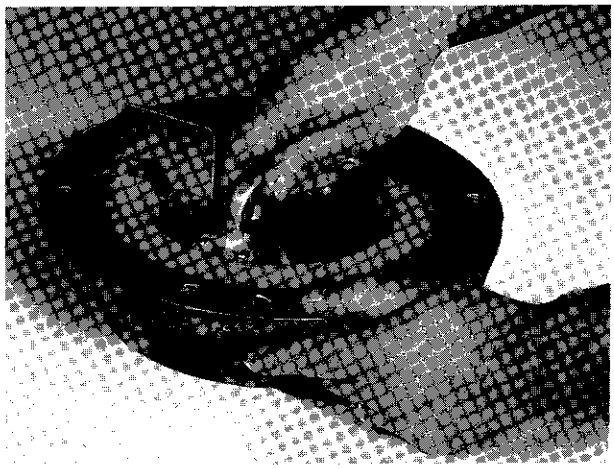

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Fig. 6 — Application Of Grease Mask

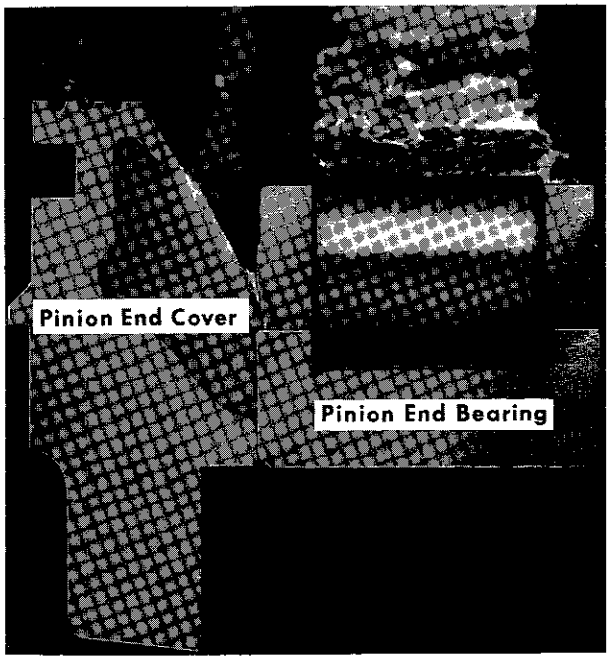

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Fig. 7 — P.E. Cover And Bearing Cross-Section

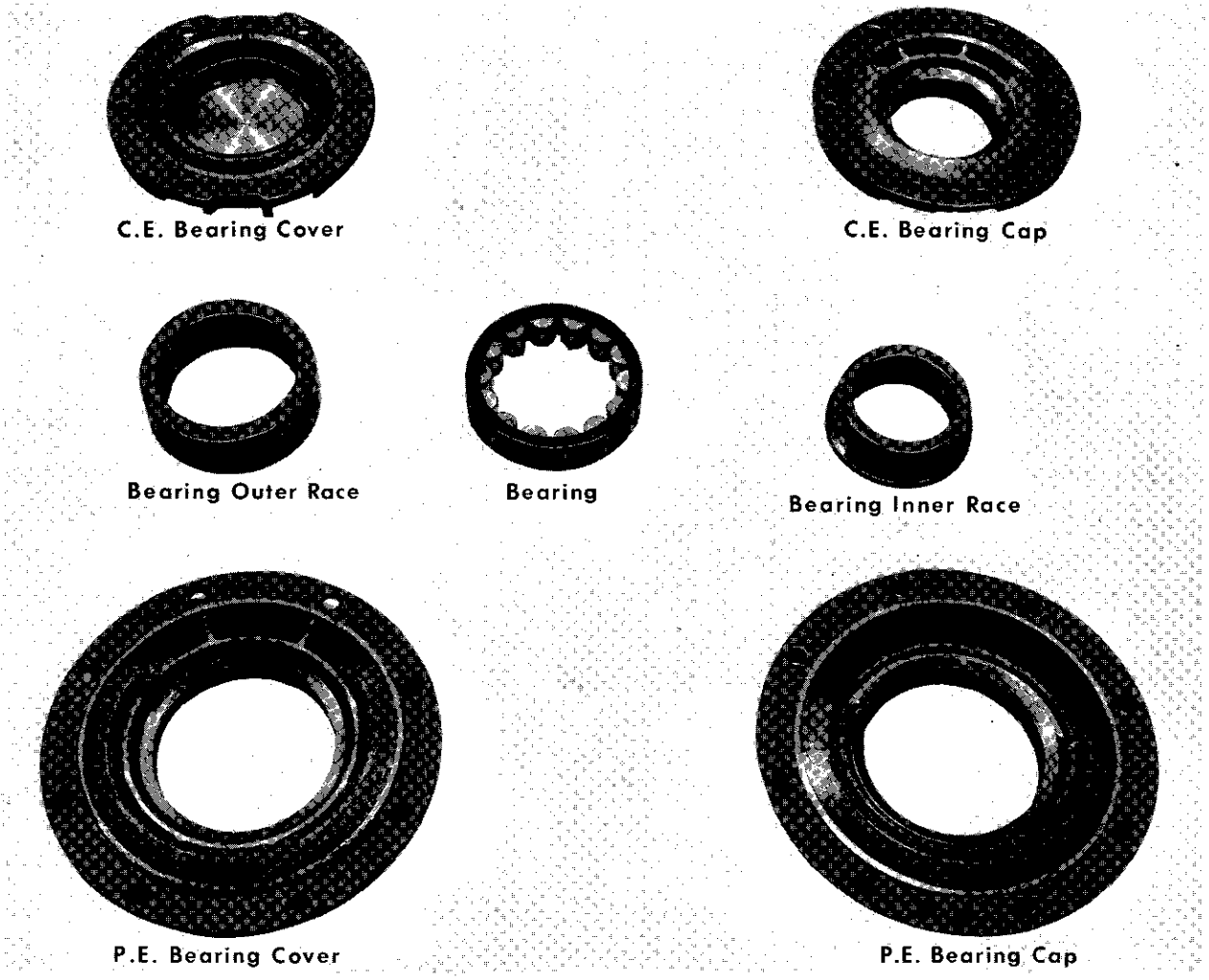

Fig. 8 — P.E. And C.E. Caps And Covers Properly Packed

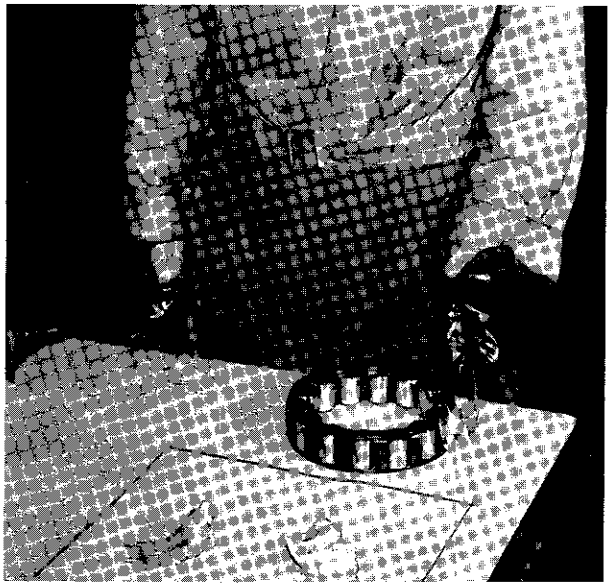

Fig. 9 — Coating O.D. Of Roller And Cage Assembly

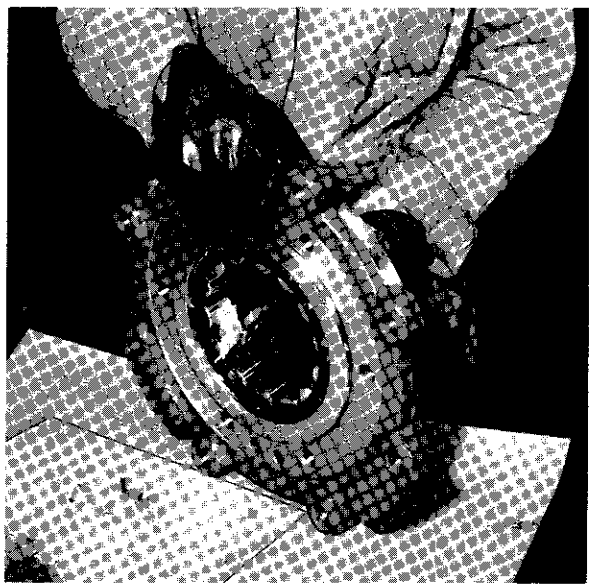

Fig. 10 — Coating I.D. Of Roller And Cage Assembly

Non-demountable Cage Type

1. Apply grease to I.D. of roller-cage assembly with spatula, and work in grease by rotating cage until all specified grease has been thoroughly distributed.

BEARING APPLICATION

Assemble the bearing as shown in Figs. 9 and 10. Lightly coat the inner races before assembling the outer race and roller-cage assembly.

When applying caps and covers, be sure grease arc is at lower portion of part, Fig. 11.

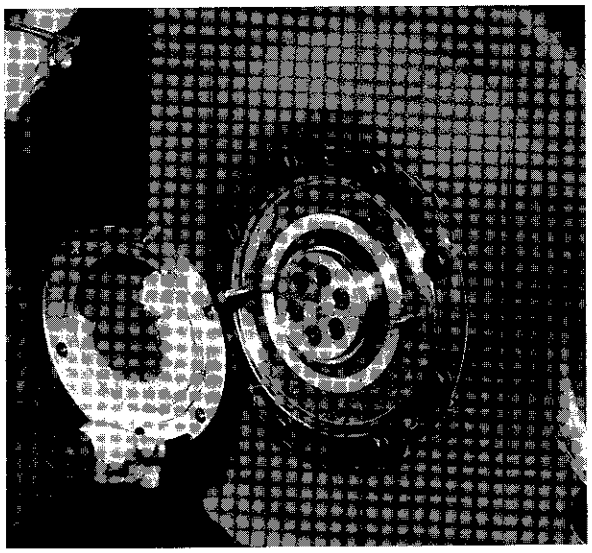

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Fig. 11 — Applying C.E. Bearing Cover

MAINTENANCE DATA

QUANTITIES OF GREASE BY WEIGHT (DEMOUNTABLE CAGE TYPE)

D27B, D37B, D47B, D57B, D67B, D75 D77B, D39, D49, D59, D69, D79	Pinion End	Commutator End
Cover	12.00 oz.	6.00 oz.
Cap	14.00 oz.	7.00 oz.
Roller Cage O.D.	2.00 oz.	1.00 oz.
Roller Cage I.D.	2.00 oz.	1.00 oz.
TOTAL	30.00 oz.	15.00 oz.

D27E, D37E, D47E, D67E, D77E		
Cover	14.00 oz.	6.00 oz.
Cap	17.00 oz.	7.00 oz.
Roller Cage O.D.	2.00 oz.	1.00 oz.
Roller Cage I.D.	2.00 oz.	1.00 oz.
TOTAL	35.00 oz.	15.00 oz.

QUANTITIES OF GREASE BY WEIGHT (NON-DEMOUNTABLE CAGE TYPE)

D17, D27		
Cover	12.00 oz.	6.00 oz.
Cap	14.00 oz.	7.00 oz.
Bearing	4.00 oz.	2.00 oz.
TOTAL	30.00 oz.	15.00 oz.

Non-demountable Cage Type

1. Apply grease to I.D. of roller-cage assembly with spatula, and work in grease by rotating cage until all specified grease has been thoroughly distributed.

BEARING APPLICATION

Assemble the bearing as shown in Figs. 9 and 10. Lightly coat the inner races before assembling the outer race and roller-cage assembly.

When applying caps and covers, be sure grease arc is at lower portion of part, Fig. 11.

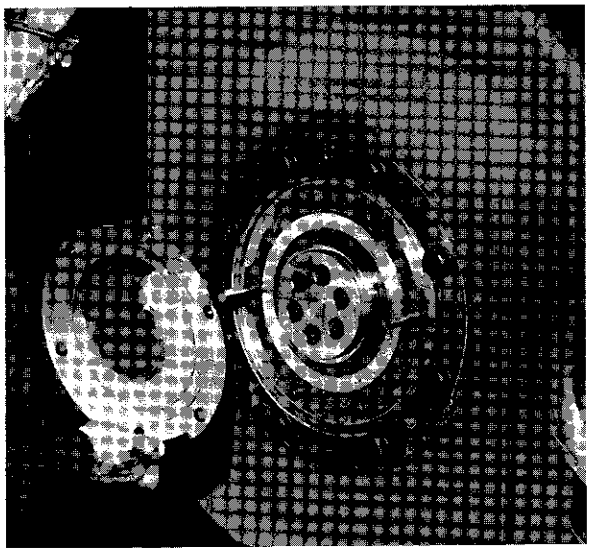

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Fig. 11 — Applying C.E. Bearing Cover

MAINTENANCE DATA

QUANTITIES OF GREASE BY WEIGHT (DEMOUNTABLE CAGE TYPE)

D27B, D37B, D47B, D57B, D67B, D75 D77B, D39, D49, D59, D69, D79	Pinion End	Commutator End
Cover	12.00 oz.	6.00 oz.
Cap	14.00 oz.	7.00 oz.
Roller Cage O.D.	2.00 oz.	1.00 oz.
Roller Cage I.D.	2.00 oz.	1.00 oz.
TOTAL	30.00 oz.	15.00 oz.
D27E, D37E, D47E, D67E, D77E		
Cover	14.00 oz.	6.00 oz.
Cap	17.00 oz.	7.00 oz.
Roller Cage O.D.	2.00 oz.	1.00 oz.
Roller Cage I.D.	2.00 oz.	1.00 oz.
TOTAL	35.00 oz.	15.00 oz.

QUANTITIES OF GREASE BY WEIGHT (NON-DEMOUNTABLE CAGE TYPE)

D17, D27		
Cover	12.00 oz.	6.00 oz.
Cap	14.00 oz.	7.00 oz.
Bearing	4.00 oz.	2.00 oz.
TOTAL	30.00 oz.	15.00 oz.

MAINTENANCE DATA (Cont'd)

D7*

Cover	9.50 oz.	6.00 oz.
Cap	11.50 oz.	2.50 oz.
Bearing	4.00 oz.	2.00 oz.
TOTAL	25.00 oz.	10.50 oz.

D7E*

Cover	12.50 oz.	6.00 oz.
Cap	10.50 oz.	2.50 oz.
Bearing	4.00 oz.	2.00 oz.
TOTAL	27.00 oz.	10.50 oz.

D27E

Cover	14.00 oz.	6.00 oz.
Cap	17.00 oz.	7.00 oz.
Bearing	4.00 oz.	2.00 oz.
TOTAL	35.00 oz.	15.00 oz.

*D7 and D7E parts are to be used only on D7 or D7E conversions.

EQUIPMENT LIST

Grease Masks

C. E. bearing cover (B and E series and industrial motors) 8228023

C. E. bearing cap (B and E series and industrial motors) 8228024

P. E. bearing cap and cover (B series and industrial motors) 8228025

P. E. bearing cap and cover (E series motors) 8238744

C. E. bearing cover (All motors using cover assembly 8248991) 8252767

Litho in U.S.A.