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 similar motors used for other applications. 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.

When assembling sealed lubricated bearings Shell Cyprina-RA grade 3 should be used. The importance of following suggested procedure as outlined in these instructions can best be emphasized by giving a short explanation as to how the grease lubricates the bearing during operation.

Fundamentally, lubrication is accomplished 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. In motors subjected to road shock a sectionalized nylon insert is provided, in the P.E. and C.E. bearing covers and the C.E. bearing cap, which helps prevent premature oxidation and purging of the bearing grease.

MAINTENANCE

PREPARATION FOR GREASE APPLICATION

Particular care and attention should be given to the proper application of grease lubricant to the armature bearings. The precautions listed below should be observed.

1. All assembly parts must be thoroughly cleaned of all foreign material and previous lubricant. All cleaning solvents must be removed and all parts perfectly dry before applying grease. Keep new or remanufactured bearings in their wrapping until application of grease. The lubricant applied to these bearings, when packaged, is compatible with the Cyprina-RA grease, therefore, if kept clean, they need not be washed.

2. Cyprina-RA grade 3 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.

4. Cleanliness can be ensured 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 ASTM 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. A clean steel bladed spatula or putty knife should be used during intermediate handling of the grease, and for greasing the bearing parts. Use of bare hands should be avoided wherever possible to prevent 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.

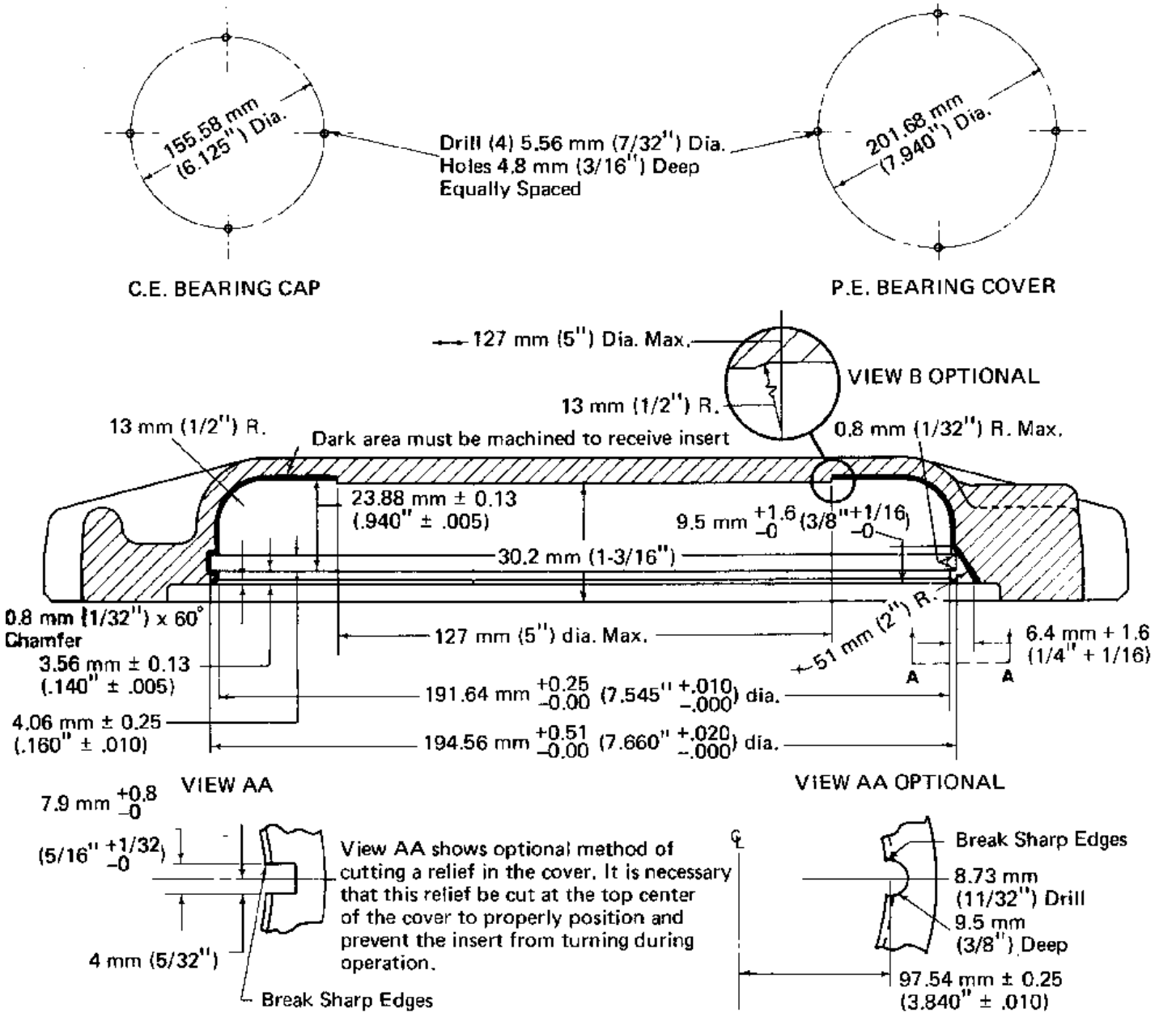

Fig. 1 – Anti-Chum Insert Modification

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.

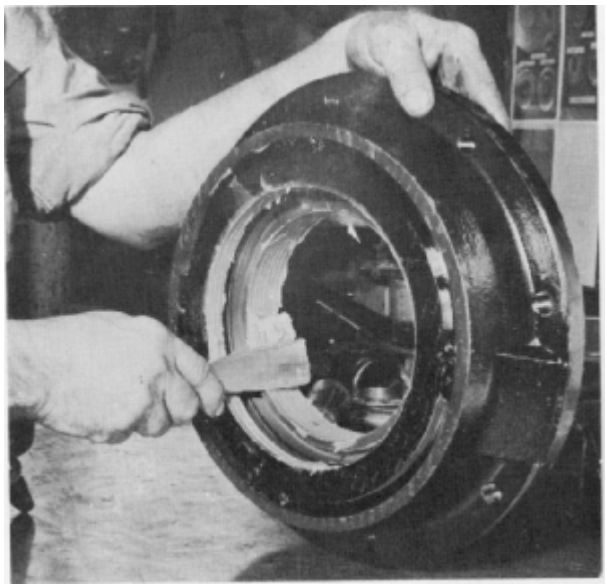

Fig. 2 - Grease Application To Labyrinth Grooves

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 for the specific bearing to be packed. See Service Data for proper quantities of grease.

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.

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. 3. 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.

   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.

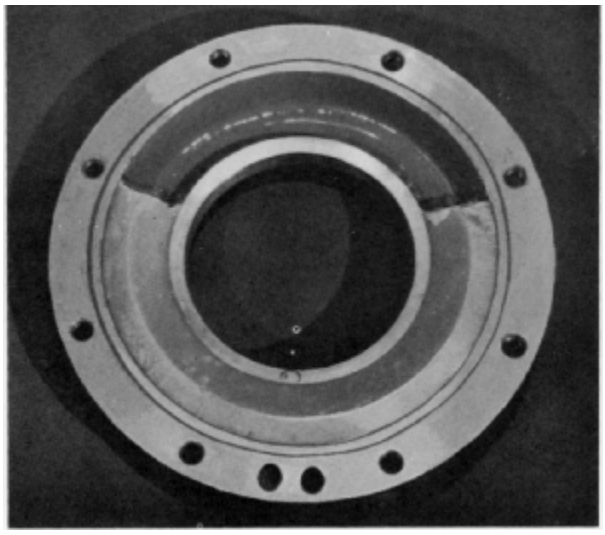

Fig. 3 - Grease Position

7. Using spatula, roughly form the grease into the approximate desired contour, Fig. 4, and apply correct grease mask as determined from the Service Data.

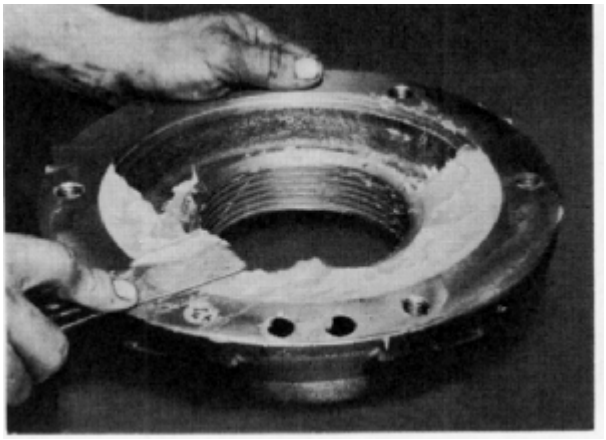

Fig. 4 - Roughly Formed Grease Contour

8. Rotate grease mask to form proper contour, keeping it seated, Fig. 5. Several turns may be required. Use spatula to fill low spots with grease from mask blade.

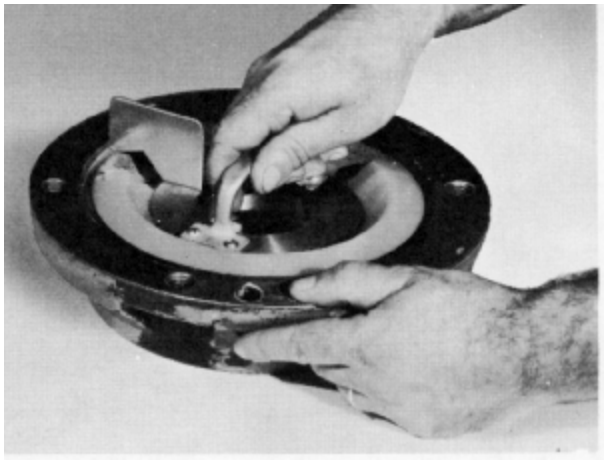

Fig. 5 - Application Of Grease Mask

9. The small amount of grease retained on the mask blade should be removed and applied to the ends of the grease arc. Fig. 6 shows the contours of grease arc applied to bearing. Fig. 7 illustrates properly packed P.E. and C.E. caps and covers.

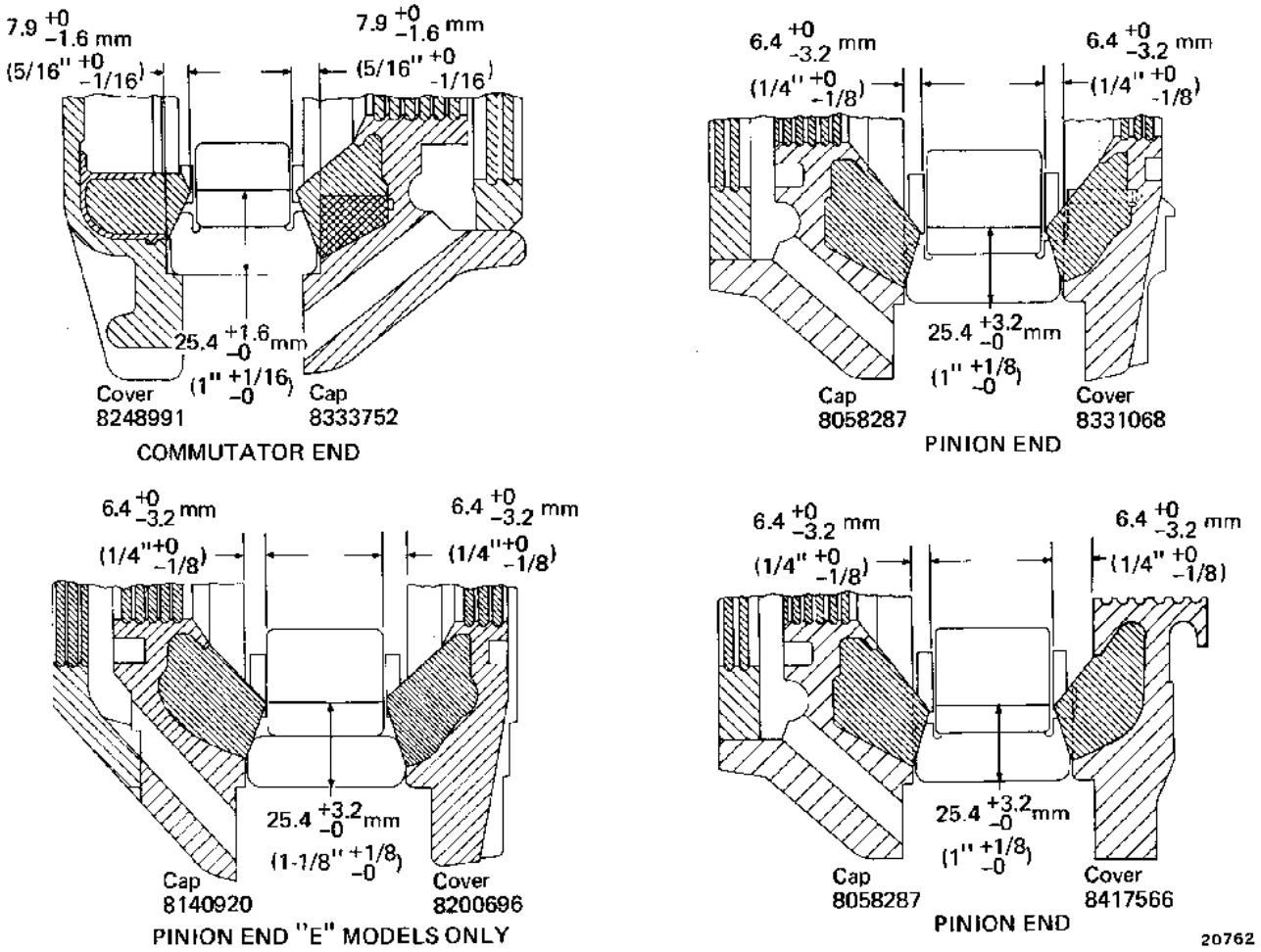

Fig. 6 - Grease Contours

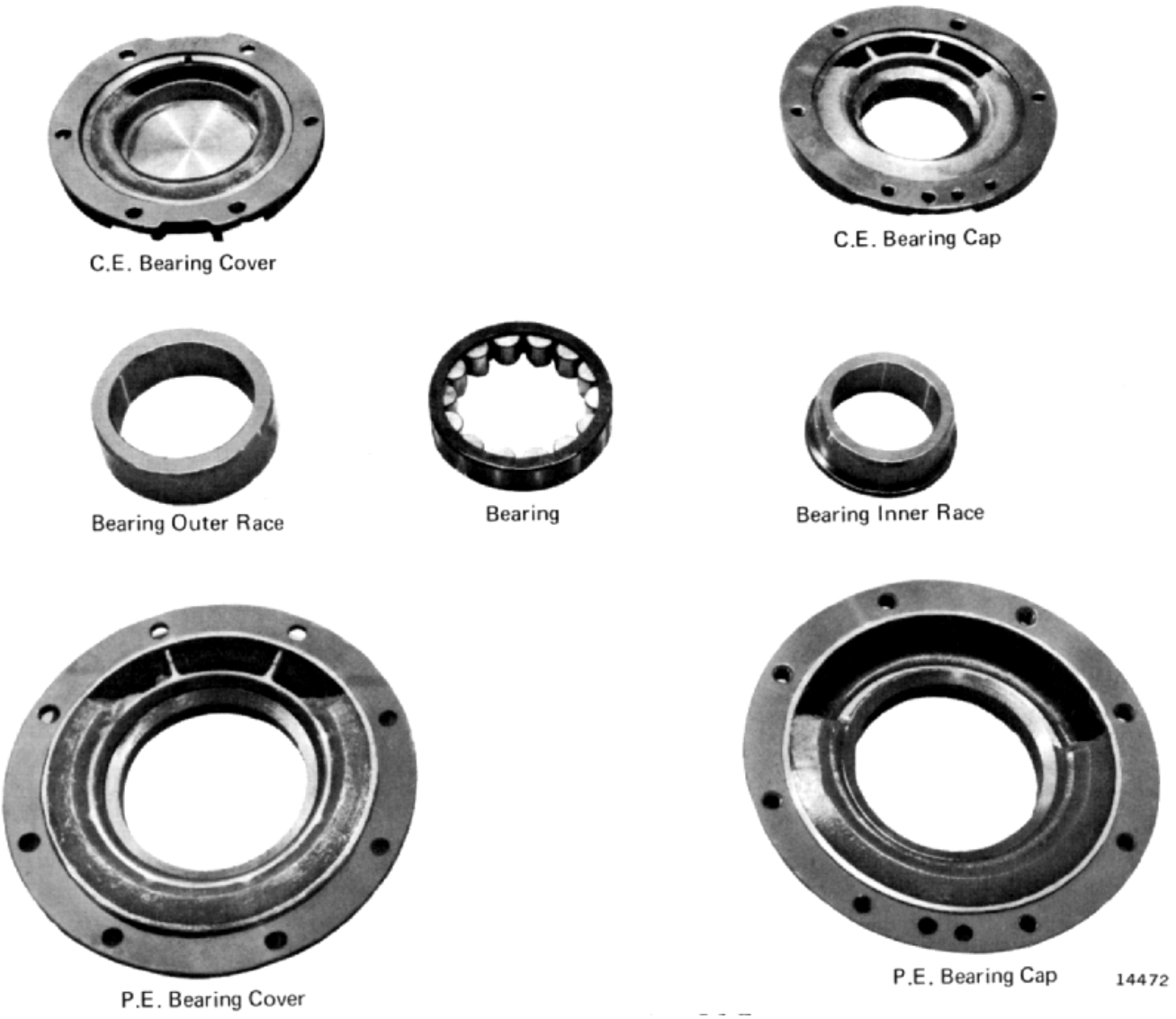

Fig. 7 - Proper Application Of Grease

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. 8, 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. 9.

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.

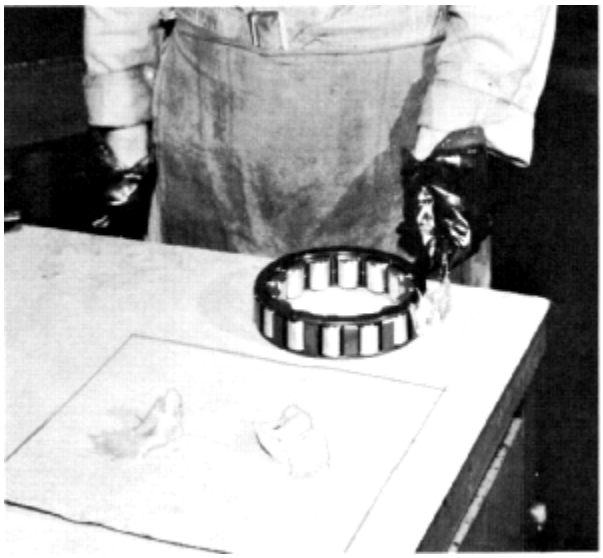

Fig. 8 - Coating O.D. Of Roller And Gage Assembly

NON-DEMOUNTABLE CAGE TYPE

l. 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.

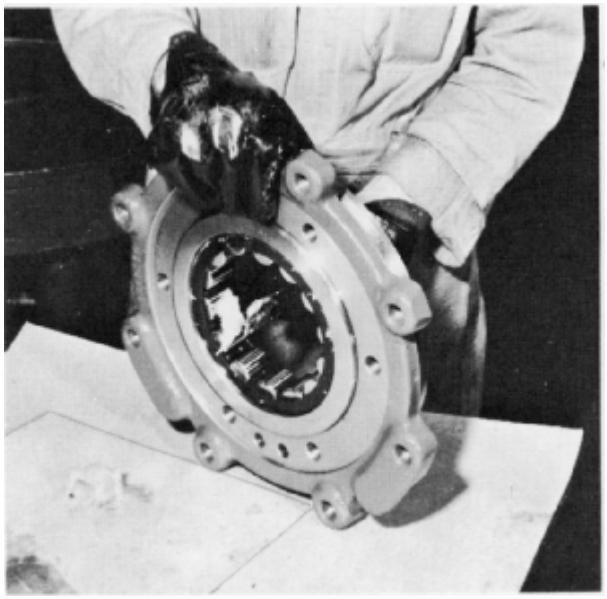

Fig. 9 - Coating I.D. Of Roller And Cage Assembly

BEARING APPLICATION

Assemble the bearing as shown in Figs. 8 and 9. 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. 10.

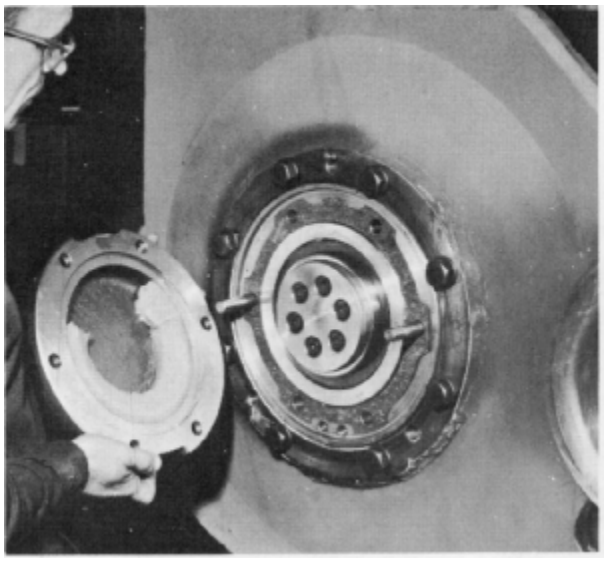

Fig. 10 - Applying C.E. Bearing Cover

SERVICE DATA

EQUIPMENT LIST

Cyprina-RA Grade 3 Lubricant

35lb(15.9kg)	8249819
120 lg (54.4 kg)	8249820

Grease Masks

Commutator end cover without insert	8228023
Commutator end cover with insert	8252767
Commutator end cap	8228024
Pinion end cap and cover ("B" models).	8228025
Pinion end cap and cover ("E" models).	8238744
Pinion end cap and cover (D77X3A and D77B models built after January 1, 1971)	File No. 777

Grease quantity by weight, ± 1/4 ounce (7 grams)

DEMOUNTABLE CAGE

D77X3A and D77B motors manufactured or rebuilt after January 1, 1971, with new pinion end seal-arrangement.

	PINION END		COMMUTATOR END	
	Ounces	Kilograms	Ounces	Kilograms
Cover	8	.227	6	.170
Cap	14	.397	7	.198
Roller Cage O.D.	2	.057	1	.028
Roller Cage I.D.	2	.057	1	.028
	26	.738	15	.424
All "B" Models (except above)				
Cover	12	.340	6	.170
Cap	14	.397	7	.198
Roller Cage O.D.	2	.057	1	.028
Roller Cage I.D.	2	.057	1	.028
	30	.851	15	.424
All "E" Models				
Cover	14	.397	6	.170
Cap	17	.482	7	.198
Roller Cage O.D.	2	.057	1	.028
Roller Cage I.D.	2	.057	1	.028
	35	.993	15	.424

SERVICE DATA (CONT'D)

NON-DEMOUNTABLE CAGE

	PINION END		COMMUTATOR END	
D7*	Ounces	Kilograms	Ounces	Kilograms
Cover	9.5	.269	6.0	.170
Cap	11.5	.326	2.5	.071
Bearing	4.0	.113	2.0	.056
	25.0	.708	10.5	.297
D7E*				
Cover	12.5	.354	6.0	.170
Cap	10.5	.298	2.5	.071
Bearing	4.0	.113	2.0	.056
	27.0	.765	10.5	.297
D17 and D27				
Cover	12.0	.340	6.0	.170
Cap	14.0	.397	7.0	.198
Bearing	4.0	.113	2.0	.057
	30.0	.850	15.0	.425
D27E				
Cover	14.0	.397	6.0	.170
Cap	17.0	1 .482	7.0	.198
Bearing	4.0	.113	2.0	.057
	35.0	.992	15.0	.425

D7 and D7E parts are to be used only on D7 and D7E conversions from oil to grease lubrication.