EMD MAINTENANCE INSTRUCTION

APPLICATION OF CYPRINA-RA GREASE TO SEALED TRACTION 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 Preliminary Precautions and Procedure given in this instruction. Precisely measured quantities of lubricant applied carefully 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 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.

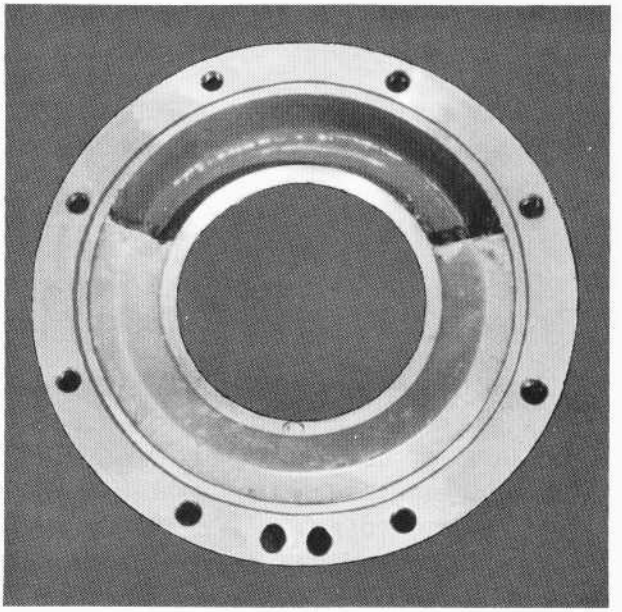


Fig. 1 - Properly Packed P.E. Cap

Shell Cyprina-RA grease lubricant for traction (drive) motor armature bearings is available in two quantities: 8216988 for 35 pound pails and 8216989 for 120 pound drums. Shell Cyprina-RA grease (used in production since August, 1954) has been proved much superior to Shell Cyprina which was previously sold under part numbers 8187220 and 8187221. It is recommended that customers discontinue use of the former grease.

MAINTENANCE

Preliminary Precautions:

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 dry before applying

* THIS BULLETIN SUPERSEDES ALL ISSUES OF M.I. 1130.

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 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.

PROCEDURE

1. After removal and thorough cleaning of all parts, 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.

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

3. Carefully weigh grease, Fig. 3, for the specified bearing to be packed. Chart I gives the proper quantity for the component parts of each type of bearing.

4. Grease application to bearing caps and covers:

   a. 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.

   b. Grease should be solidly packed only into the lower 170° - 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:

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

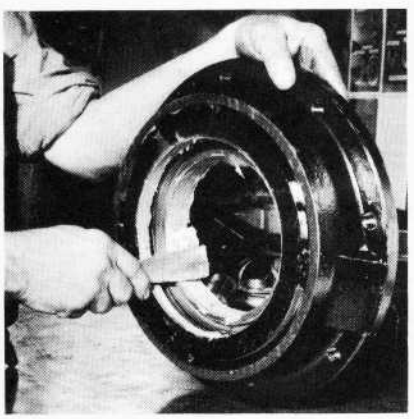


Fig. 2 - Grease Application To Labyrinth Grooves

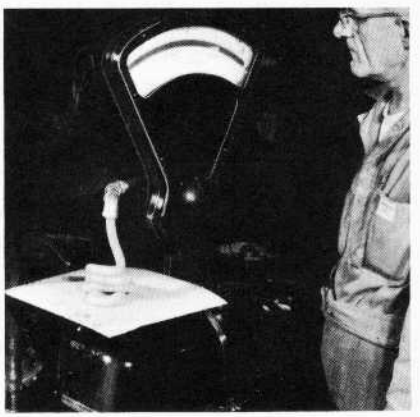


Fig. 3 - Weighing Grease

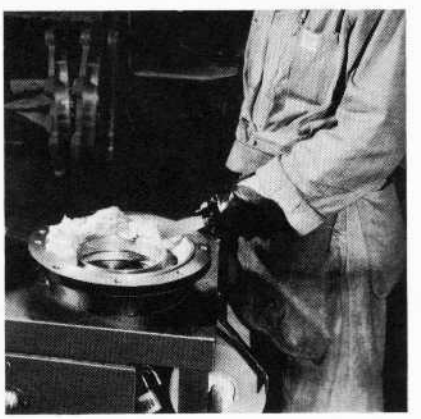


Fig. 4 - Rough Application Of Grease To P.E. Cap

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

(3) The C.E. and P.E. bearing caps have two drain holes at the bottom.

c. Using spatula, roughly form the grease into the approximate desired contour. See Fig. 5.

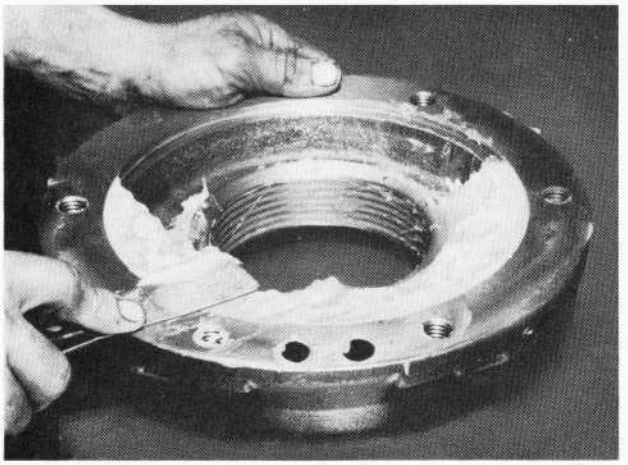


Fig. 5 - Roughly Formed Grease Contour

d. Apply correct grease mask, as determined from the listing below:

C.E. cover - - - - - - -	mask #8228023
C.E. cap - - - - - - - -	mask #8228024
P.E. cap and cover - -	mask #8228025

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

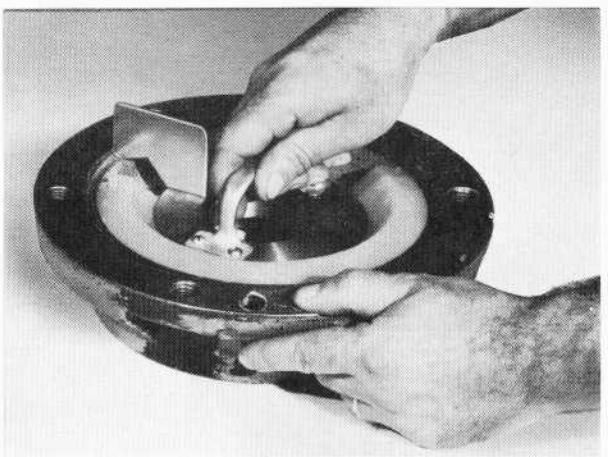


Fig. 6 - Application Of Grease Mask

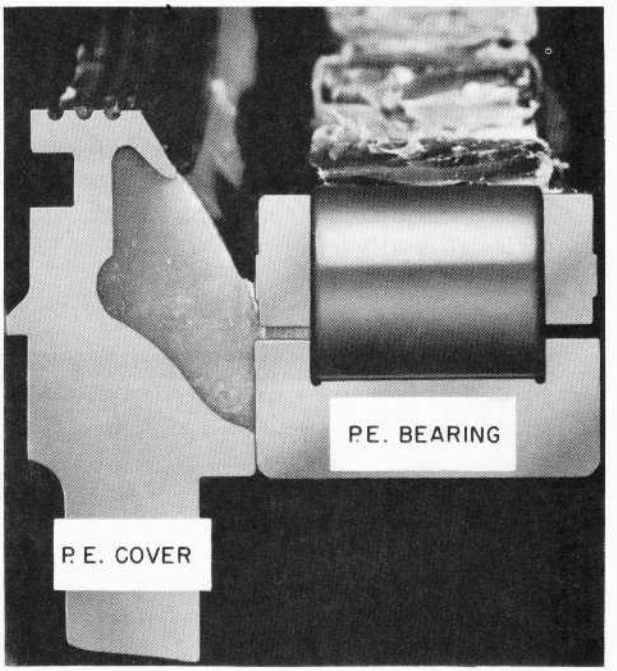


Fig. 7 - P.E. Cover And Bearing Cross-Section

f. 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.

5. Grease application to roller-cage assembly (demountable cage type):

a. 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.

b. 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 — 1 ounce each for I.D. and O.D.

NOTE: 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.

6. Grease application to roller-cage assembly (non-demountable cage type):
   a. 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.
7. It is important that all measured grease for each specific operation be fully used.
8. Lightly coat the inner races before assembling the outer race and roller-cage assembly.
9. When applying caps and covers, be sure grease arc is at lower portion of part, Fig. 11.

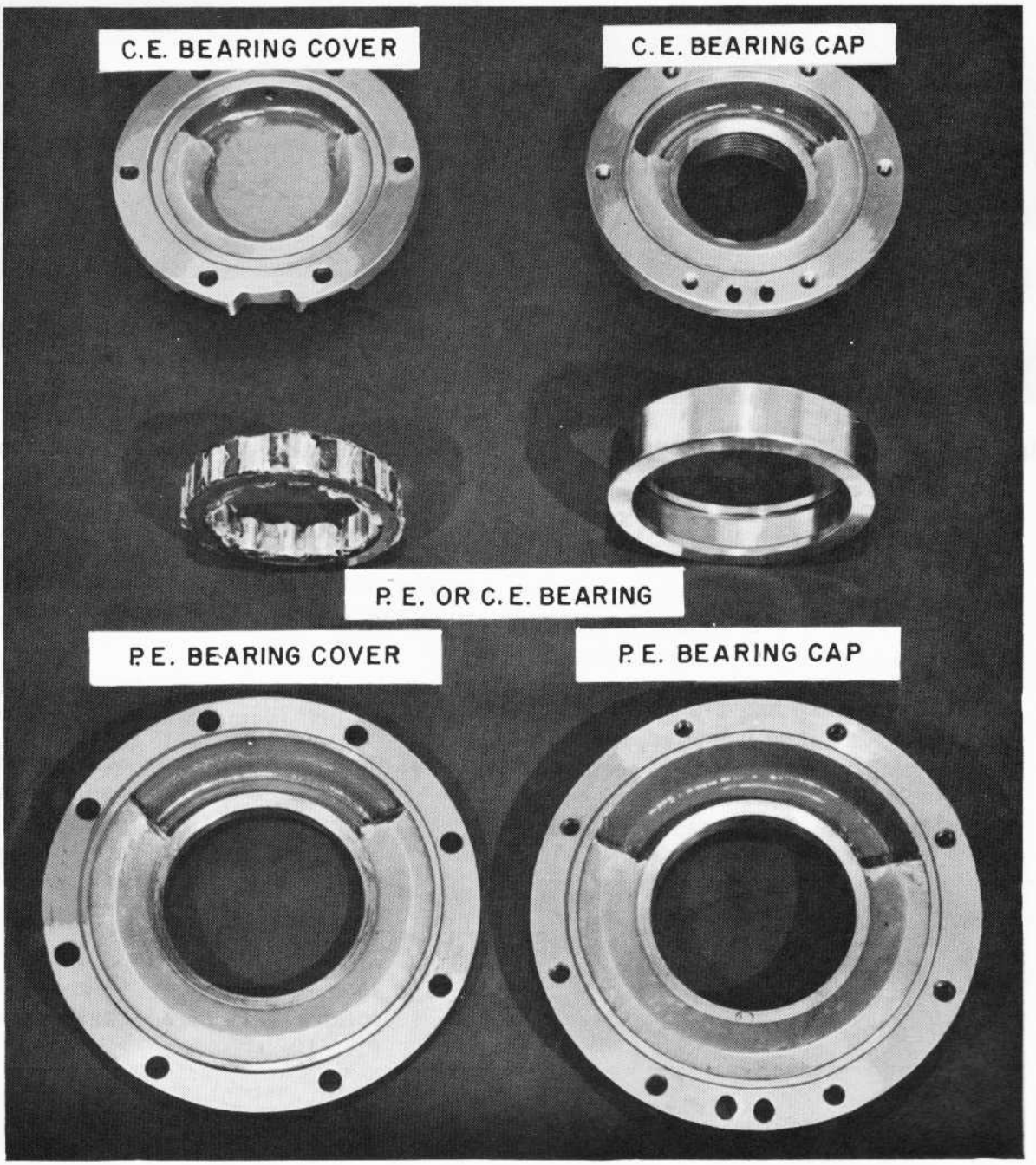


Fig. 8 - P.E. And C.E. Caps And Covers Properly Packed

NOTE: 11" x 14" size colored photographs of Figs. 7 and 8 for hanging in motor assembly area are available for purchase.

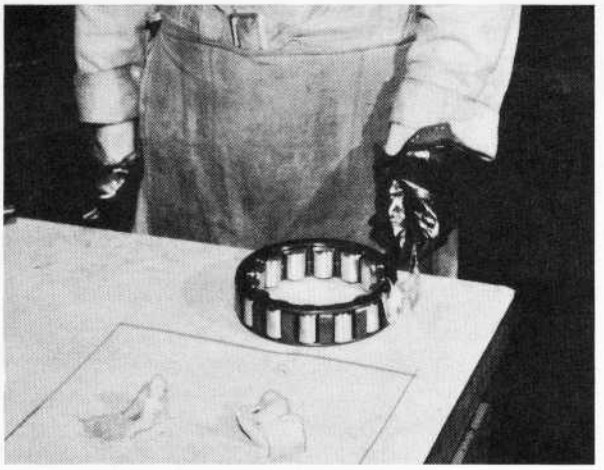


Fig. 9 - Coating O.D. Of Roller And Cage Assembly

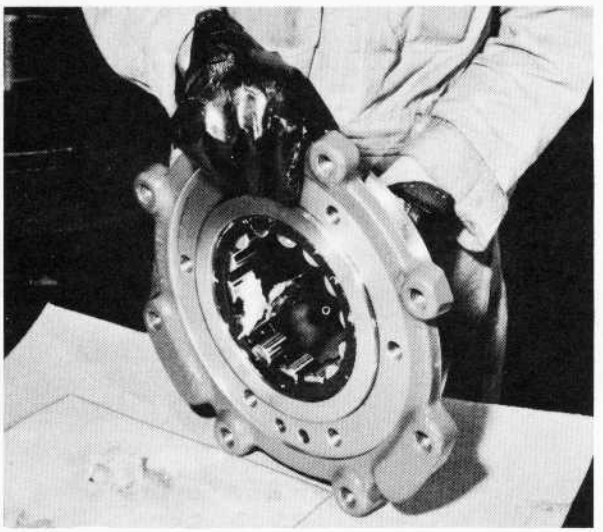


Fig. 10 - Coating I.D. Of Roller And Cage Assembly

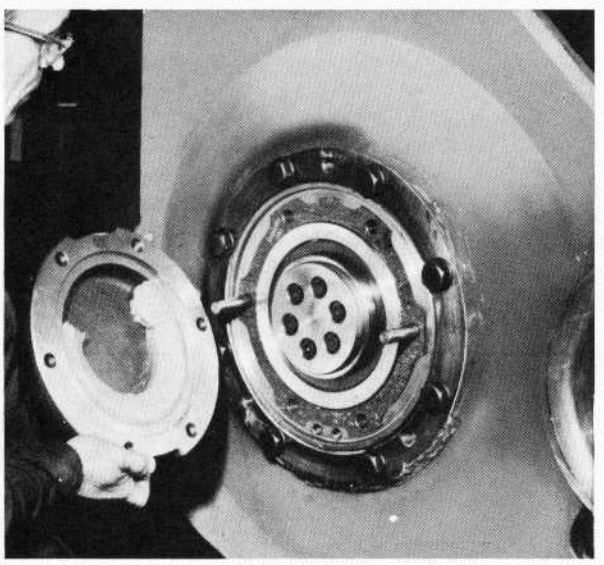


Fig. 11 - Applying C.E. Bearing Cover

CHART I

QUANTITIES OF GREASE BY WEIGHT
(DEMOUNTABLE CAGE TYPE)

D27B, D37B, D39M	Pinion End	Commutator End
Cover	12.00 oz.	9.00 oz.
Cap	14.00 oz.	7.00 oz.
Roller Cage O.D.	1.00 oz.	1.00 oz.
Roller Cage I.D.	1.00 oz.	1.00 oz.
TOTAL	28.00 oz.	18.00 oz.
D27E, D37E		
Cover	14.00 oz.	9.00 oz.
Cap	17.00 oz.	7.00 oz.
Roller Cage O.D.	1.00 oz.	1.00 oz.
Roller Cage I.D.	1.00 oz.	1.00 oz.
TOTAL	33.00 oz.	18.00 oz.

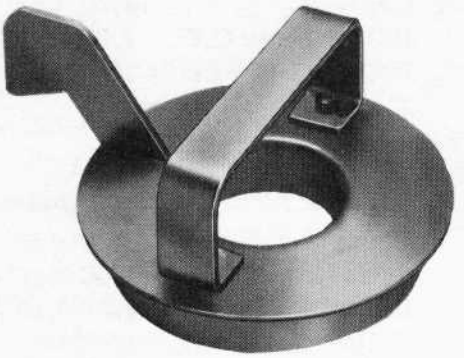
QUANTITIES OF GREASE BY WEIGHT
(NON-DEMOUNTABLE CAGE TYPE)

D17, D27B	Pinion End	Commutator End
Cover	10.50 oz.	7.75 oz.
Cap	12.50 oz.	5.75 oz.
Bearing	5.00 oz.	2.50 oz.
TOTAL	28.00 oz.	16.00 oz.
D7*		
Cover	9.50 oz.	7.00 oz.
Cap	11.50 oz.	2.50 oz.
Bearing	5.00 oz.	2.00 oz.
TOTAL	26.00 oz.	11.50 oz.
D7E*		
Cover	12.50 oz.	7.00 oz.
Cap	10.50 oz.	2.50 oz.
Bearing	5.00 oz.	2.00 oz.
TOTAL	28.00 oz.	11.50 oz.
D27E		
Cover	12.50 oz.	7.75 oz.
Cap	15.50 oz.	5.75 oz.
Bearing	5.00 oz.	2.50 oz.
TOTAL	33.00 oz.	16.00 oz.

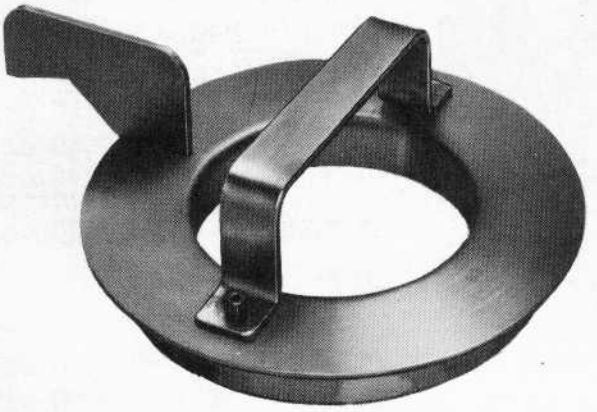
* D7 and D7E parts are to be used only on D7 or D7E conversions.

The three grease masks, Fig. 12, required to properly grease pack traction (drive) motor armature bearings are available from Electro-Motive Parts Department. These specially designed precision tools are made to very close tolerances and are chromium plated to provide the finest instruments for performing this important grease application operation.

Drawings of these masks are available on request.



C.E. BEARING CAP
GREASE MASK
8228024



P.E. BEARING CAP
AND COVER
GREASE MASK
8228025

C.E. BEARING COVER
GREASE MASK
8228023

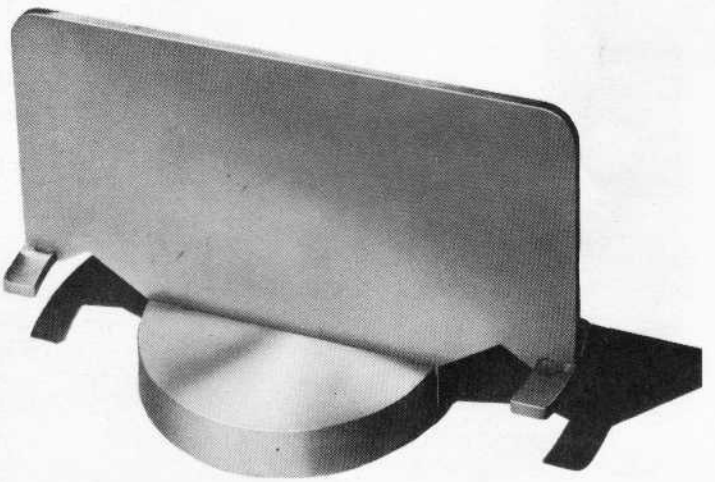


Fig. 12 - Grease Masks