Marland Clutch

INSTALLATION, LUBRICATION, MAINTENANCE of

TYPE F SERIES "M" automatic freewheeling CLUTCH-COUPLINGS

Illustration 1

Assembled view of Marland One-Way Clutch-Coupling with standard double engagement gear type half coupling.

ALL UNITS ARE SHIPPED WITHOUT OIL. Care must be taken not to place the unit in operation until it has been filled with oil of proper specification.

The various component parts referred to in this bulletin may be readily identified on the diagrams and parts list.

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To fill with oil, see item 5

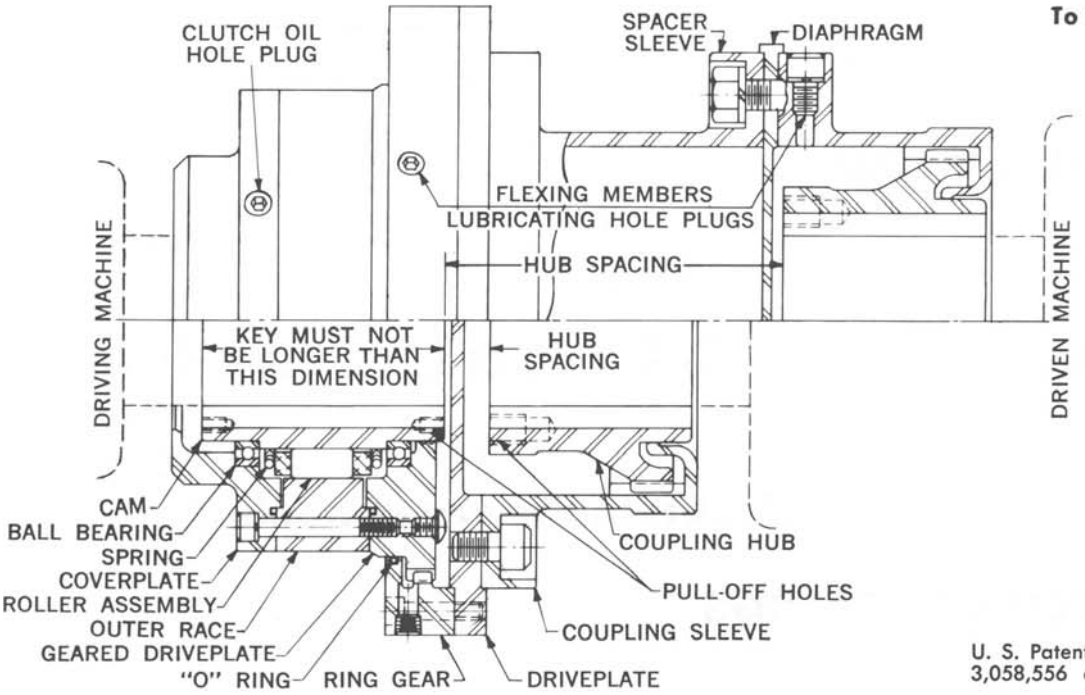


Illustration 2

U. S. Patent Nos. 2,998,113, 3,017,002, 3,058,556 and other patents pending.

INSTALLATION

1. PREPARE UNIT FOR INSTALLATION

Marland One-Way clutch-couplings are shipped completely assembled. To disassemble for mounting, remove the capscrews connecting the coupling sleeve to the driveplate, and the ring gear to the driveplate, taking care not to damage the gasket and "O" ring.

Remove driveplate from clutch assembly and driven hub from coupling sleeve, leaving ring gear assembled on geared driveplate.

CAUTION — Check factory assembly of clutch for correct direction of rotation before proceeding with mounting. To check, hold outer race stationary while trying to rotate the cam first in one direction, then in the opposite direction.

The clutch may already be assembled for proper rotation but if not, this can easily be changed in the field as per instructions on page 6.

2. MOUNTING

GENERAL — DO NOT USE TAPERED KEYS. Both keys must fit tight on sides only and must not be tight on top and bottom. Be sure that shafts are smooth and straight, and not tapered, before assembly of hubs on shafts.

Over-all length of key in clutch cam must not exceed the cam length.

Coat both shaft ends with oil, white lead, grease or powdered graphite to aid in hub mounting.

Clutch half and coupling half must be mounted on their respective shafts before the machines are moved into position for shaft alignment.

(A) CLUTCH HALF

(1) Make certain that all clutch assembly capscrews are tightened securely before proceeding with mounting.

(2) Cam bore is ground for a snug tight fit on the **DRIVING SHAFT.** Care should be taken when mounting that any pressure used to push cam on shaft is applied to *end of cam hub only.* Do not apply pressure or hammer blows on face of geared driveplate as this could damage the clutch bearings.

(3) End of cam should come flush with end of shaft, unless shown otherwise on certified drawing.

(B) COUPLING HALF

(1) Place coupling sleeve over **DRIVEN SHAFT.**

(2) Coupling hub is shrink fit on shaft. Immerse hub in oil, not over 300° F., for a sufficient period of time to expand the bore so that it can be located on the shaft in the proper position without interference. Make certain keyways are in line and install key as soon as hub is in place and before hub has chance to cool and set on shaft. Length of key in hub must not exceed the hub length.

(3) End of hub should come flush with end of shaft unless shown otherwise on certified drawing.

IMPORTANT — A freewheeling clutch-coupling which transmits torque in one direction only and therefore, is not subject to reverse torque stress, does not require as heavy a press fit of hubs on their shafts as is necessary with an ordinary coupling.

A severe shrink fit or heavy driving fit for either hub should be avoided as such a fit may expand the cam and reduce roller clearance or result in improper bearing fits. Should it be necessary to expand the coupling hub, use only hot oil or oven. See note 2A2 and 2B2. Two long bolts located in the threaded pull-off holes may be used to handle the hot hub.

We definitely advise against the use of set screws.

3. SPACING AND ALIGNMENT OF HUBS

(A) SPACING

Hubs must be separated by the gap specified on the certified drawing enclosed with these instructions. This allows proper end float without binding. THIS IS IMPORTANT.

(B) PARALLEL ALIGNMENT

(1) SIGHT METHOD

Use a straight edge across the aligning surfaces of hubs to indicate parallel alignment, as shown in illustration 3. When hub alignment shoulders are of unequal diameters, a step alignment tool is furnished with the clutch coupling. Maintain correct hub separation as in "A" above.

(2) INSTRUMENT METHOD

Fasten or clamp indicator bracket on coupling hub alignment surface with dial indicator button contacting alignment surface of cam. Rotate shaft on which indicator is attached to hub, and take readings at 4 points, 90° apart. Align until readings are identical. Maintain correct hub separation as in "A" above.

(C) ANGULAR ALIGNMENT — SIGHT METHOD

To check angular alignment, use a tapered thickness gauge or inside calipers at 4 points. 90° apart, between the inside faces of hubs as shown in Illustration 3. Position machines so that these faces are parallel with each other. Maintain correct hub separation as in "A" above.

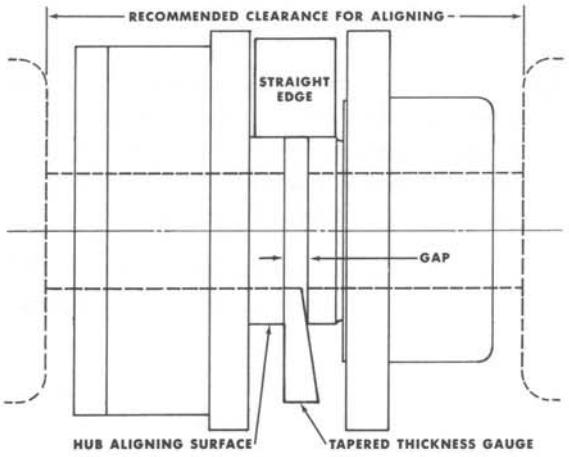


Illustration 3

NOTE — Clutch-couplings are not intended to be used as universal joints, therefore the greatest care must be exercised in making as near perfect alignment as possible, both parallel and angular.

4. ASSEMBLE CLUTCH WITH COUPLING

Thoroughly clean the clutch driveplate and coupling sleeve faces of any grit or dirt, and apply a coat of light grease on these faces.

Make sure the gasket is in good condition and place it in the counterbore of the driveplate.

Place two capscrews spaced at 180° apart through the coupling sleeve holes to position the gasket and driveplate Line up one lubricating hole in the coupling flange with one oil hole in the clutch coverplate and one lubricating hole in the ring gear, before fastening the coupling flange to the clutch driveplate.

Insert remainder of capscrews and tighten securely.

Check to make certain there is a slight axial movement of the assembled unit without binding of the gear teeth or clutch assembly.

5. INITIAL LUBRICATION BEFORE PLACING IN OPERATION

(Also see "Lubrication and Maintenance," page 5.)

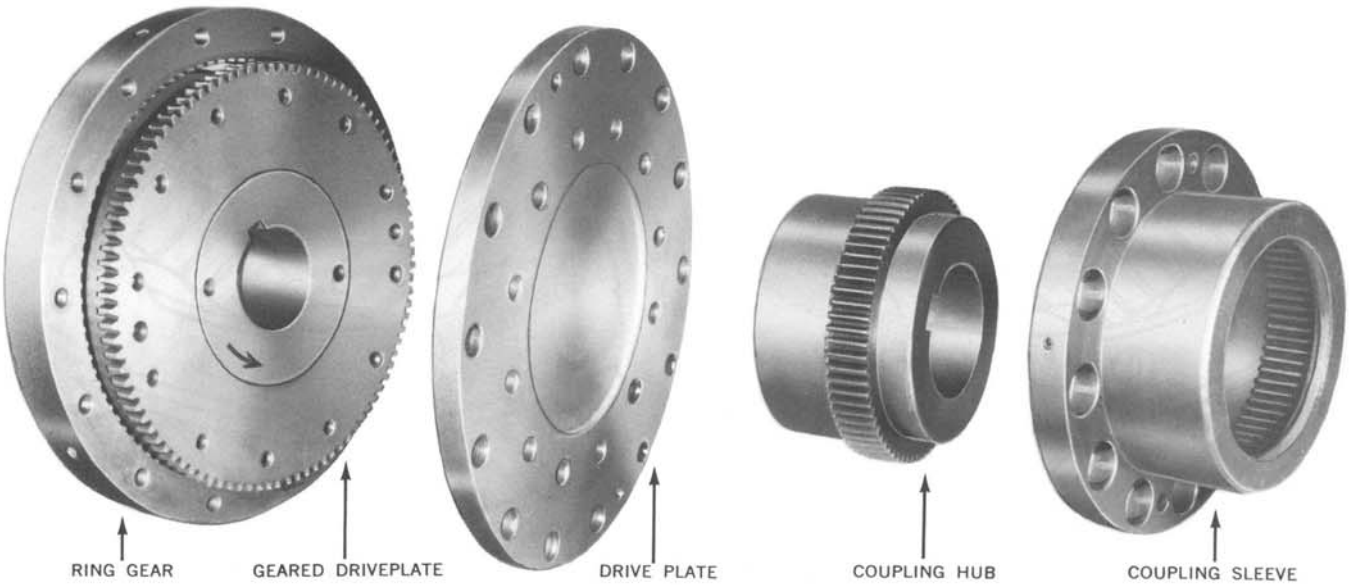
Marland One-Way clutch-couplings are shipped **WITHOUT OIL** and must not be placed in operation before the unit has been filled as specified on the certified drawing enclosed.

(A) CLUTCH HALF. To fill clutch half with oil, remove one oil hole plug from top side of clutch coverplate. Fill with oil of the grade and amount specified on the certified drawing, usually Type 'A'—Suffix 'A' transmission fluid.

(B) FLEXING MEMBERS. To fill, remove two lube plugs 180° apart from Coupling Sleeve Flange. Position coupling so that one hole is 45° above horizontal. Apply lubricant in this hole. Use lubricant of the grade specified by the coupling manufacturer. Fill with ½ the amount shown for coupling size in Table A on certified drawing.

Remove two lube plugs 120° apart from RING GEAR. Place remainder of lubricant in one hole while other serves as air vent.

Be sure to replace and tighten all plugs and capscrews. Make sure ring gaskets are in position and undamaged.



Disassembled view of Marland One-Way clutch coupling with standard double-engagement gear-type half coupling. When assembled, external gear teeth of the coupling hub totally engage the internal teeth of the coupling sleeve. The external teeth of the clutch geared driveplate totally engage the internal teeth of the clutch ring gear to provide clutch half of double-engagement gear-type coupling.

Illustration 3-A

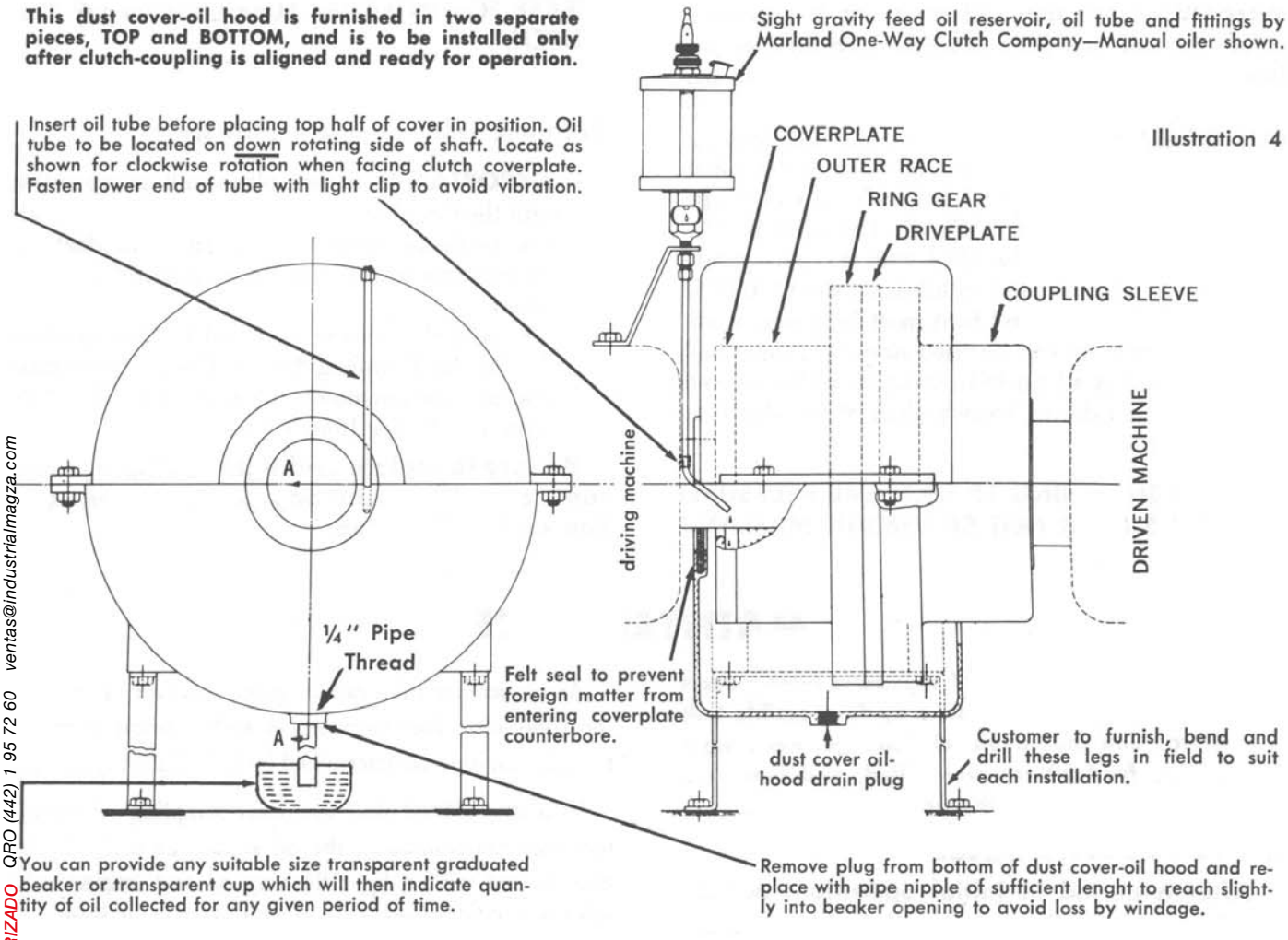


Illustration 4

Suggested method for determining amount of oil loss through gaskets, or by oil hole plugs being loose. If amount of oil so collected is excessive and gaskets and plugs are tight, check position of gravity oil supply tube to make certain the end of the tube is at the lowest point and positioned to permit the oil to enter the clutch coverplate chamber as in Illustration 4.

6. INSTALL DUST COVER-OIL HOOD AND SIGHT GRAVITY FEED OIL RESERVOIR

(Furnished as standard except when otherwise specified on certified drawing.)

Install bottom half of dust cover-oil hood as in Illustration 4. Mount transparent oil reservoir and fittings as shown in Illustration 4, properly locating end of oil tube on **DOWN** rotating side of shaft. The gravity oil supply tube should be carefully checked to see that it follows a continuous decline from the oil reservoir all the way to the very end or tip of the tube where it fits into the clutch coverplate chamber. (See Illustration 4.)

IT IS IMPORTANT that end of oil tube be at lowest point. Any reversed slanting of the oil tube from its end or tip may result in capillary dribbling back out of the coverplate along the outside of the tube unless properly slanted so that the end of the tube is definitely at the lowest point.

Be sure to fasten lower end of oil tube with a light clip to avoid vibration. Fasten as shown in Illustration 4.

Fill oil reservoir with same oil as used to fill the clutch. Adjust oil feed in drops per minute, as indicated on certified drawing, by turning knurled screw just above locknut, with on-and-off lever at top in a vertical position.

Oil flow may be stopped by placing on-and-off lever in a horizontal position. SHUT-OFF VALVE WILL NOT DISTURB FEED ADJUSTMENT. **Be sure to turn oil flow on when unit is placed in operation.**

Install top half of dust cover-oil hood.

LUBRICATION

Marland One-Way Clutch Couplings are shipped **WITHOUT** lubrication and must not be operated before the unit has been properly lubricated as per Item 5, Page 3, and as shown on the certified drawing.

CLUTCH HALF. The certified drawing will indicate the grade of oil to be used and the quantity required for initial filling of the clutch half only (usually Type 'A' Suffix 'A' Transmission Fluid). The sight gravity feed oil reservoir must be filled with the same grade and type of oil as is used to lubricate the CLUTCH HALF and the rate of oil feed must be properly adjusted as shown on the certified drawing. This small rate of oil feed is adequate to make up oil loss caused by vaporization during freewheeling of the clutch at motor speeds.

OILS CONTAINING EP (EXTREME PRESSURE) ADDITIVES MUST NOT BE USED IN MARLAND ONE-WAY CLUTCH-COUPLINGS. NEVER USE GREASE FOR INTERNAL LUBRICATION OF THE CLUTCH.

FLEXIBLE MEMBERS. (Coupling half and clutch ring gear—geared driveplate space)

IMPORTANT—Do not place unit in operation until the Coupling Half gear teeth and clutch ring gear teeth are properly lubricated. Lubricate as per coupling manufacturer's recommendations enclosed.

Place ½ the amount specified for the coupling size in the Coupling Sleeve Flange lubricating hole, and the remaining half in the *Ring Gear* lubricating hole. See Item 5, Page 3.

Be sure to replace and tighten all plugs and capscrews. Make sure ring gaskets are in position and undamaged.

MAINTENANCE

CAUTION — Retighten all capscrews after a short period of operation to take up for possible bolt stretch and thus avoid oil leakage. Keep sight gravity feed oil reservoir filled, and feed rate and position of oil tube properly adjusted.

CLUTCH MAINTENANCE

After a period of initial operation, not exceeding several days, it is advisable to drain the initial supply of oil and flush out any small particles of foreign matter that might have accumlated during the early running in of the unit. During such draining and flushing the pipe plug in the bottom half of the dust cover should be removed to permit the drained oil to run out of the dust cover.

To obtain the longest possible service life from your Marland One-Way clutch-coupling, it is of utmost importance that systematic lubrication-maintenance be observed. It is necessary that the lubricating oil within the unit be clean and free from sludge or contamination at all times.

Regular inspection of the condition of the oil within the unit is desirable and the frequency of such inspection will depend upon surrounding atmosphere whether dusty or humid. Drain and closely examine a sample of the oil from one of the **clutch coverplate** oil holes to detect the presence of contamination. The **condition of the oil so examined will determine the frequency of future inspections** and when the unit will require draining, flushing and refilling with fresh oil.

As no definite rules can be given to cover all operating conditions, the frequency of such lubrication-maintenance can only be determined by individual experience.

It is important that whenever sampling of the oil indicates contamination, the oil should be drained, the unit flushed with a light flushing oil and immediately refilled with the proper grade and amount of fresh oil.

OPERATING TEMPERATURE — Clutch-couplings will gradually warm up during continuous freewheeling until thermal equilibrium is established. When this temperature is reached, the heat caused by agitation of the oil bath, together with slight frictional losses, will be dissipated at the same rate as it is generated.

The normal freewheeling operating temperature of a clutch-coupling, depending on size, speed and surrounding temperature conditions, may vary from cool or warm to the hand, to the point where it is too hot to leave the hand on for more than a few seconds at a time.

An operating temperature rise of 75 to 90 degrees F. above ambient temperature is not critical.

COUPLING MAINTENANCE. Refer to Coupling manufacturer's recommendations regarding lubrication maintenance of the gear type flexible coupling.

ALIGNMENT—Systematic inspection of shaft alignment insures the most successful service. Misalignment of the two shafts which may occur as the connected machines settle, should be corrected as soon as discovered.

TO CHANGE DIRECTION OF ROTATION OR TO DISASSEMBLE AND ASSEMBLE CLUTCH HALF ONLY

CAUTION — Keep all parts thoroughly clean. Do not allow grit or dirt to enter during disassembly or assembly operation.

NOTE — The ball bearings are a slide fit on the cam and a tight fit in the coverplate and geared driveplate.

TO DISASSEMBLE

1 (a) Place clutch assembly flat on bench with the coverplate facing up.

(b) Remove capscrews attaching coverplate thru outer race to geared driveplate.

2 (a) Lift off coverplate using pull-off-holes provided, taking care not to damage the "O" Ring or bearings.

(b) Hold the outer race to the geared driveplate with two capscrews spaced 180° apart.

3 (a) It is not necessary to disconnect the springs or remove the stop lugs. Using the pull-off holes in the cam, with a slight twisting motion in the direction to move the rollers toward the deeper end of the cam flats, lift out the cam and roller assembly as a unit.

(b) Stand it on end on bench in exactly the same relative position as when assembled in the clutch, taking care not to damage or crush the springs.

(c) **TO CHANGE DIRECTION OF ROTATION** Turn cam unit with roller assembly over end for end. Slowly rotate the cam, in direction to move the rollers toward the deep end of the flats, when inserting into the outer race. **DO NOT FORCE THE ASSEMBLY INTO THE OUTER RACE.**

Complete assembly of clutch as per instructions, starting with TO ASSEMBLE. operation 1 (e).

TO ASSEMBLE (A completely disassembled clutch)

1 (a) Place geared driveplate flat on bench with "O" Ring side up.

(b) Apply light film of oil or grease to "O" Ring in ring gear. Mesh gear teeth and tap ring gear over geared driveplate, taking care not to damage "O" Rings.

(c) Place outer race on geared driveplate.

(d) Locate bolt holes by inserting 2 screws, several turns, at 180° apart.

(e) Slowly rotating the cam in direction to move the rollers toward the deep end of the flats, insert the cam unit with roller assembly into the outer race. **DO NOT FORCE THE ASSEMBLY INTO THE OUTER RACE.** The cam journal diameter will slide into the ball bearing in the geared driveplate.

2 (a) **CHECK DIRECTION OF ROTATION**

Rotate the cam unit to make certain the cam flats engage the rollers to drive the outer race in the desired direction of rotation. If not correct, see TO DISASSEMBLE operation 3 (a).

(b) Make certain the spring tension is sufficient to cause the whole roller assembly, when well lubricated, to move quickly to the high cam position, when the cam is rotated by hand toward the deep part of the cam flats and released.

3 (a) Remove 2 locating screws. Making certain "O" Ring is in groove of the coverplate, place coverplate over cam journal diameters.

(b) For later servicing convenience, line up one oil hole in coverplate with one lubricating hole in ring gear. Securely tighten all capscrews.

(c) Clutch is now ready for mounting as per Installation Instructions. operation 1, page 2.

IMPORTANT — Retighten all capscrews after a short period of operation to take up for possible bolt stretch and thus avoid oil leakage.

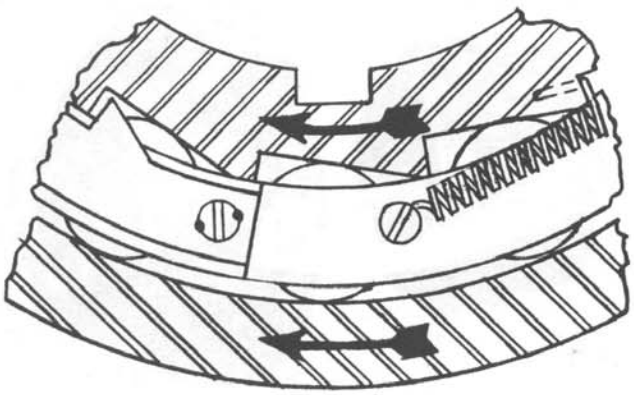


Illustration 5 — Assembled position of cam unit and roller assembly for CLOCKWISE freewheeling rotation of outer race. Also driving rotation of cam, when looking at coverplate side of outer race.

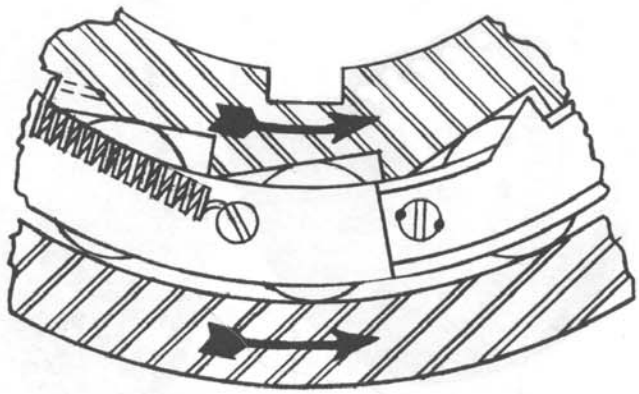


Illustration 6 — Assembled position of cam unit and roller assembly for ANTI-CLOCK freewheeling rotation of outer race. Also driving rotation of cam, when looking at coverplate side of outer race.