

MAINTENANCE AND SERVICE INSTRUCTIONS AIRFLEX MAGNETIC CLUTCHES



MAINTENANCE AND SERVICE-AIRFLEX MAGNETIC CLUTCHES

Airflex Magnetic Clutches are run-in and adjusted at the factory and no further service should be required until the operating air gap has diminished through disc pack wear to practically zero.

When properly applied, the wear rate when operating in oil will be exceedingly small; hence, air gap adjustment is required very infrequently. Because of the many variables in each application, it is impossible to accurately predict what the wear rate will be. When operated dry, the wear rate will, of course, be greater than in oil and adjustment will be required sooner.

When wear does reduce the operating air gap to zero (evidenced by the inability of the clutch to transmit any torque), it should be reset to the gap shown in the accompanying table. (See Procedure for Adjusting Operating Air Gap.)

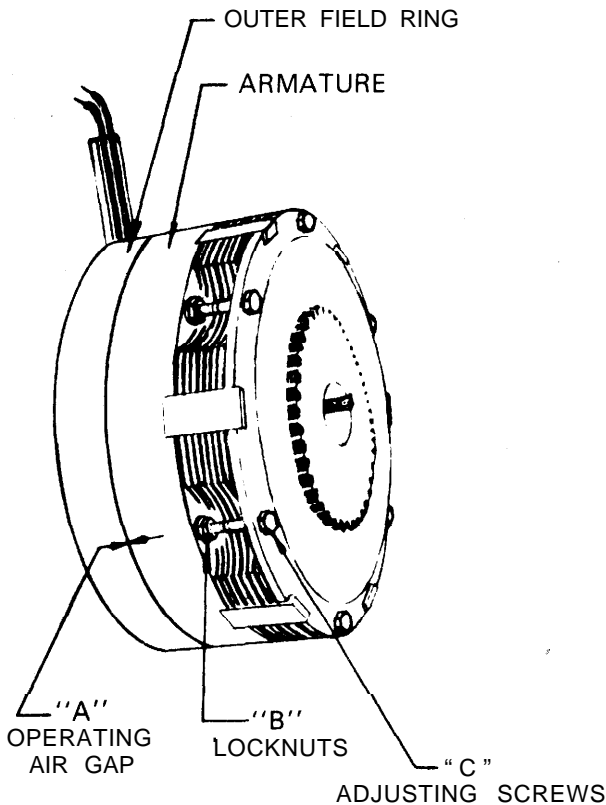
Over the entire range of Airflex clutch sizes, three or four readjustments of the air gap can be made before the friction discs are worn out. A good rule to follow is that when the spiral grooves on one of the discs have disappeared, the entire disc pack should be replaced.

Wear rate is directly related to heat. Excessive heat and high operating temperatures are a major cause of rapid wear. Hence, the units should always be as well ventilated as possible. Usually disc life can be increased by operating the units at the minimum D.C. voltage that is consistent with the accelerating and decelerating torque requirements of the load.

Dirt and other abrasive materials are also detrimental to the life of the disc pack and care should be taken to protect the clutch from foreign material of this sort. If the disc pack does become contaminated with abrasive material, it should be cleaned out with a suitable solvent.

PROCEDURE FOR ADJUSTING OPERATING AIR GAP:

Adjusting the operating air gap is a relatively simple matter if the procedure below is followed. Care should be taken to set the air gap within one or two thousandths of that shown below since the torque



CLUTCH SIZE	OPER. AIR GAP "A"
SC-225	.008
SC-275	.010
SC-325	.010
SC-375	.012
SC-450	.012
SC-550	.014
SC-650	.016
SC-775	.018
SC-825	.018
SC-950	.020
SC-1000	.020
SC-1150	.024

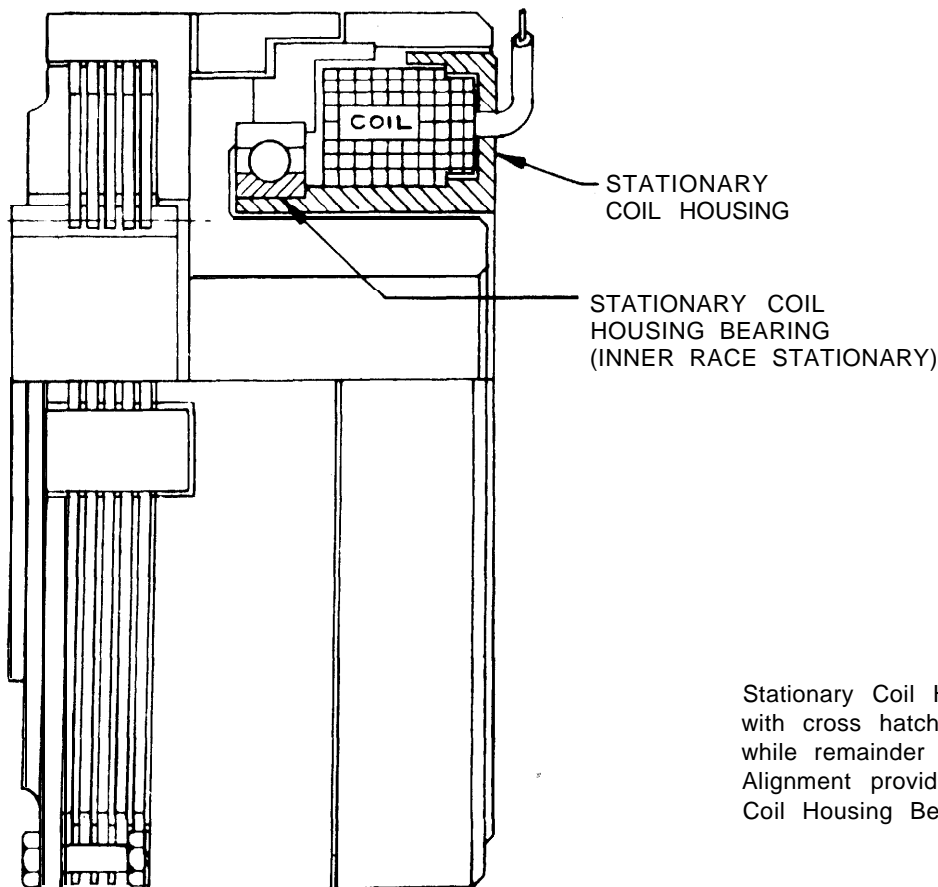
of the clutch is dependent upon the air gap. When the air gap is set larger than specified, the torque is decreased and when the air gap is set smaller than specified, the torque is increased. The air gap should be set evenly all around in order to obtain best clutch performance.

Adjust the air gap as follows:

1. Loosen the six locknuts "B".
2. Energize the clutch with full voltage to attract the armature to the outer field ring. Allow it to remain energized during the entire adjustment.
3. Loosen the six adjusting screws "C" to allow the armature to be drawn squarely up against the outer field ring all around.
4. Tighten the six adjusting screws sufficiently to produce approximately .005 air gap all around. Starting at one adjusting screw, tighten it sufficiently to produce the specified gap by this screw. Repeat this for each of the other five adjusting screws.
5. When the air gap is correct all around the clutch, tighten locknuts "B" while holding the adjusting screws.

STATIONARY COIL HOUSING BEARING:

As shown in the figure below, the stationary coil housing is aligned by means of a special design precision ball bearing. When the clutches are assembled at the factory these bearings are well packed with AEROSHELL GREASE #16 (Shell Oil Company, New York, New York). Extensive tests have shown this grease to be the best lubricant for Airflex Magnetic Clutches.



Stationary Coil Housing Assembly shown with cross hatching remains stationary while remainder of clutch rotates. Alignment provided by Stationary Coil Housing Bearing.

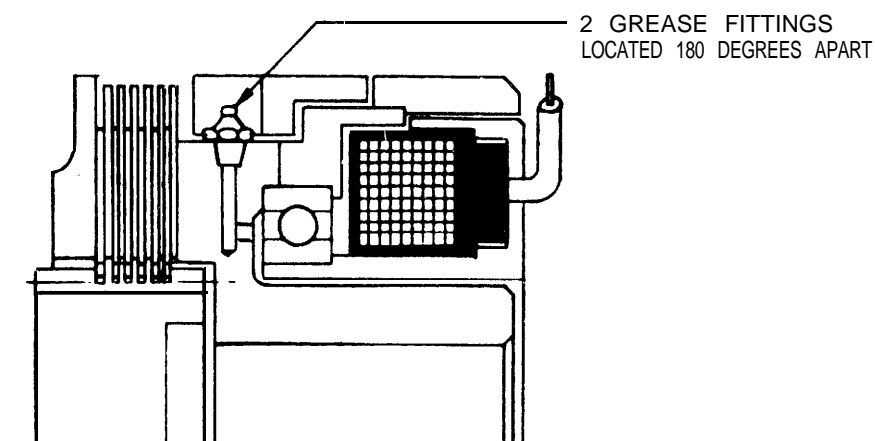
Because of the unique patented construction of the Airflex Magnetic Clutch, there is no thrust load on the stationary coil housing bearing. In addition, the radial load on this bearing is only that due to the weight of the stationary coil housing. As a result, good bearing life can be expected with a minimum of attention.

When the clutch is operated in a proper oil spray, mist or splash atmosphere, sufficient oil can get into the bearing to provide good oil lubrication and long bearing life can be expected. When the clutch is operated in a dry atmosphere and kept within normal operating temperatures, the factory packing of grease in and around the bearing can be expected to provide adequate lubrication for a number of years. If for any reason the clutch is disassembled, the bearing should be thoroughly washed with clean solvent and repacked only with AEROSHELL #16 grease.

CLUTCHES WITH RELUBRICATION PROVISIONS

The Airflex Magnetic Clutch can be provided with grease fittings to allow for the relubrication of the stationary coil housing bearing. This design is recommended for severe applications with the clutch running in a dry atmosphere.

The grease fittings used are standard hydraulic lubrication fittings with a relief slot cut into it. The two fittings used in each clutch are located as shown below.



The clutch should be lubricated after about every 200 hours of operation. The interval between lubrication can be increased or decreased depending upon the severity of the application. Both fittings should be greased until the grease starts to come out of the relief slots-AVOID OVER-GREASING.

The grease used should be a high quality, high temperature, medium weight grease, such as: "Molilub BRB Lifetime Grease" (Socony Mobil Oil Company), "Sohiotron #2, (Standard Oil Company), or "Seal Gull Maxilube #2" (C. H. Clark Oil Company).

A lubrication instruction plate is attached to the clutch near the lubrication fitting.

TROUBLE	POSSIBLE CAUSE	CHECK AND REMEDY
Clutch not releasing.	<p>Existing Unit too small for job.</p> <p>Misalignment.</p> <p>Release springs not functioning properly.</p> <p>Axial movement of one or both clutch members.</p> <p>Driven gear not engaging all friction discs.</p> <p>Steel driving discs warped from severe overheating.</p> <p>Stationary Coil housing bearing frozen.</p>	<p>Check actual application conditions and consider substitution of larger size unit.</p> <p>Check alignment of driving and driven members and correct if misaligned. *</p> <p>Check for broken, fatigued, or missing release springs and replace springs if there is any question about the effectiveness of the springs.</p> <p>Check axial position of clutch body and driven gear to make sure that there is no mechanical interference between them.</p> <p>Check to see if driven gear has moved axially and allowed one or more friction discs to drop off and jam-up disc pack. Replace friction discs if internal teeth are damaged.</p> <p>Inspect steel driving discs for warpage. If warped, replace all steel discs and remedy cause of overheating.</p> <p>Check bearing condition by rotating stationary coil housing. If bearing frozen because of overheating, replace bearing and remedy cause of overheating.</p>

NOTE: SINCE POWER BRAKE IS ACTUALLY A MODIFIED CLUTCH-SAME SERVICE CHECKS WILL APPLY,

*Concentricity between driven gear shaft and clutch body shaft must be within .003 T.I.R. See M-103-B for further information on installation and alignment.

SERVICE CHECK CHART

TROUBLE	POSSIBLE CAUSE	CHECK AND REMEDY
Loss of Torque	<p>Loss of electrical power to clutch.</p> <p>Clutch coil open or short circuited.</p> <p>Operating air gap diminished to zero.</p> <p>Friction Discs worn excessively</p> <p>Friction Discs soaked with oil or grease in a dry clutch application.</p> <p>Driven gear not engaging all friction discs.</p>	<p>Check input voltage to clutch. If voltage is low or zero, check control. If up to rated voltage check clutch further.</p> <p>Measure coil resistance with ohmmeter and check against rated resistance.</p> <p>Check air gap with feelers and reset if necessary.</p> <p>Inspect friction discs and replace if spiral grooves worn off.</p> <p>Examine discs and clean with a suitable solvent if oil or grease contamination present.</p> <p>Check to see if driven gear has moved axially and allowed one or more friction discs to drop off. Replace friction discs if internal teeth are damaged.</p>
Rapid Wear	<p>Clutch overloaded.</p> <p>High starting or stopping load causing excessive short-time friction disc temperatures.</p> <p>Excessive heating.</p>	<p>Check actual work load against rating of clutch and reduce cyclic rate if rating is exceeded.</p> <p>Decrease voltage to clutch if application will allow. Run for a period of time and check for reduced wear.</p> <p>Check to make sure holding arm is not held rigidly.</p> <p>Increase oil supply if unit operates in oil atmosphere.</p> <p>Increase ventilation if unit is enclosed and operating dry.</p> <p>Check to make sure that release springs separate disc when clutch is de-energized.</p> <p>Replace springs if necessary.</p>

Call or write for additional information Eaton Corporation, **Industrial Drives Division**, 9919 Clinton Road, Cleveland, Ohio 44144.

EATON PRODUCT WARRANTY

Subject to the conditions stated herein, Eaton Corporation warrants to the Purchaser that each new Airflex Product manufactured by Eaton will be free from failures caused by defects in material and workmanship, and will deliver its rated capacity, for a period of twelve (12) months from the date of shipment to Purchaser, provided such Product is properly installed, properly maintained, operated under normal conditions and with competent supervision. Warranty claims shall be made in writing and the part or parts shall, if requested by Airflex Division, be returned prepaid to the Airflex Division for inspection. Upon a determination that a defect exists, Eaton shall thereupon correct any defect, at its option either by repairing any defective part or parts or by making available at Eaton's plant a repaired or replacement part. This warranty does not extend to normal wear parts or components of the Product, such as friction material and friction surfaces.

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