Dings CO
DYNAMICS GROUP

DIRACT BRAKES 70 & 80 SERIES INSTRUCTIONS

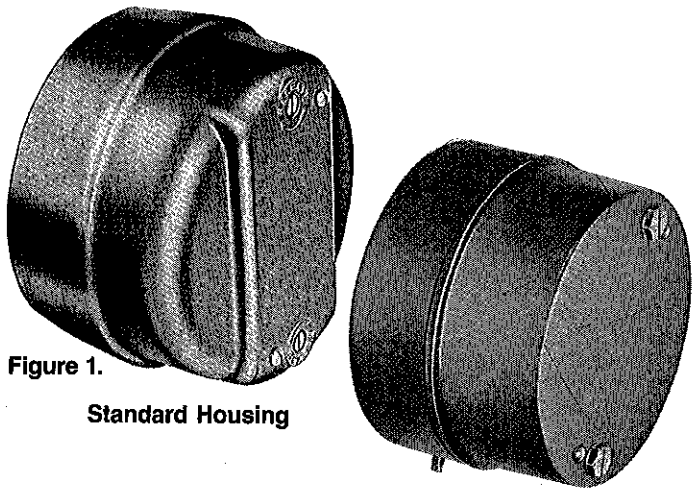


Figure 1.

Standard Housing

Enclosed Housing

IMPORTANT

Read this bulletin carefully before installing or operating this brake. Failure to comply with these instructions cancels all warranties since the safety of the unit may be endangered by improper installation or operating procedures.

WARNING

Brake performance and features must be carefully matched to the requirements of the application.

Consideration must be given to torque requirements, especially where an overhauling condition exists, as well as thermal capacity, ambient temperature, atmospheric explosion hazards, type of enclosure and any other unusual conditions.

Improper selection and installation of a brake and/or lack of maintenance may cause brake failure which could result in damage to property and/or injury to personnel.

If injury to personnel could be caused by brake failure, additional means must be provided to insure safety of personnel.

Do not operate manual release or energize brake coil before installation, in order to preserve prealignment of rotating discs for ease of installation.

DESCRIPTION

This brake is direct acting, electromagnetically released and spring set. It uses rotating and stationary disc contact to supply positive braking action. It retains quick release and setting capabilities at all times.

Simplicity of design has reduced maintenance to an absolute minimum. As with any electromechanical equipment, however, periodic inspection and adjustment will assure optimum performance. As the friction disc wears, the magnet gap will increase. The magnet gap should be checked periodically and adjusted when necessary.

INSTALLATION

Refer to Figures 3 & 5, Tables 1, 2 & 4

Figure 1 illustrates Diract brakes with a standard manual release. This release consists of two rods visible thru the cover. An optional release, the Mark II, has a single lever as shown in Figure 4.

1. Remove hub (1) from brake and position on motor shaft with key according to dimension "N." Stamped part number on hub should face away from motor. Tighten hub set screws with 12 ft. lbs. torque. On Mark II release models, motor shaft should not extend beyond hub.
2. Remove cover screws (24) and cover (23), plus "O" ring (28) and gasket (32) on enclosed housing models. On Mark II models, move release lever to horizontal position. Remove cover.
3. Place brake on motor, guiding discs on hub. On Mark II models, the release lever should hang down. The release mechanism is reset by gravity.
4. Bolt brake to motor "C" face with four socket head cap screws. See Tables 1 and 2, and Figure 3 for screw size.
5. Connect coil leads per appropriate wiring diagram in Figure 2 and replace cover.

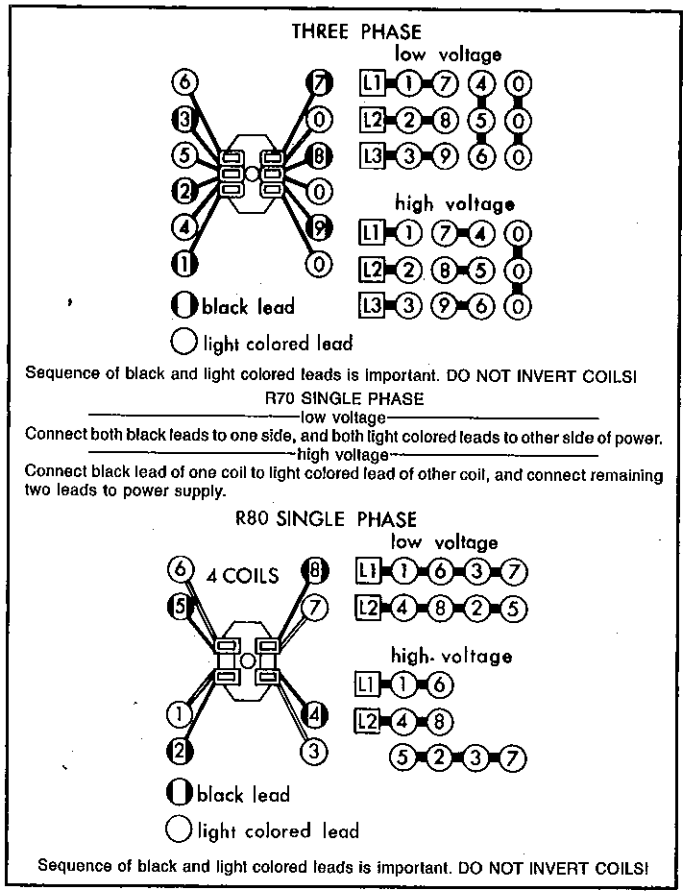


Figure 2. Wiring Diagram

MANUAL RELEASE OPERATION

Refer to Figures 4 & 5

To operate standard release (Figure 5), rotate two rods (10) clockwise until stop screw (14) hits pin. To operate Mark II release (Figure 4), push lever (12) to upward position. Brake will remain in released position until rods or lever are manually returned to original position, or until electrical power is restored which automatically resets the brake.

TORQUE ADJUSTMENT

Refer to Figures 3 & 5, Tables 1 or 2

Brake is factory set for rated torque per spring length "H." To increase stopping time and lower torque, turn two locknuts (9) counter-clockwise, increasing dimension "H." Both spring lengths should be equal. Do not decrease spring length "H" as this may cause coil to burn out.

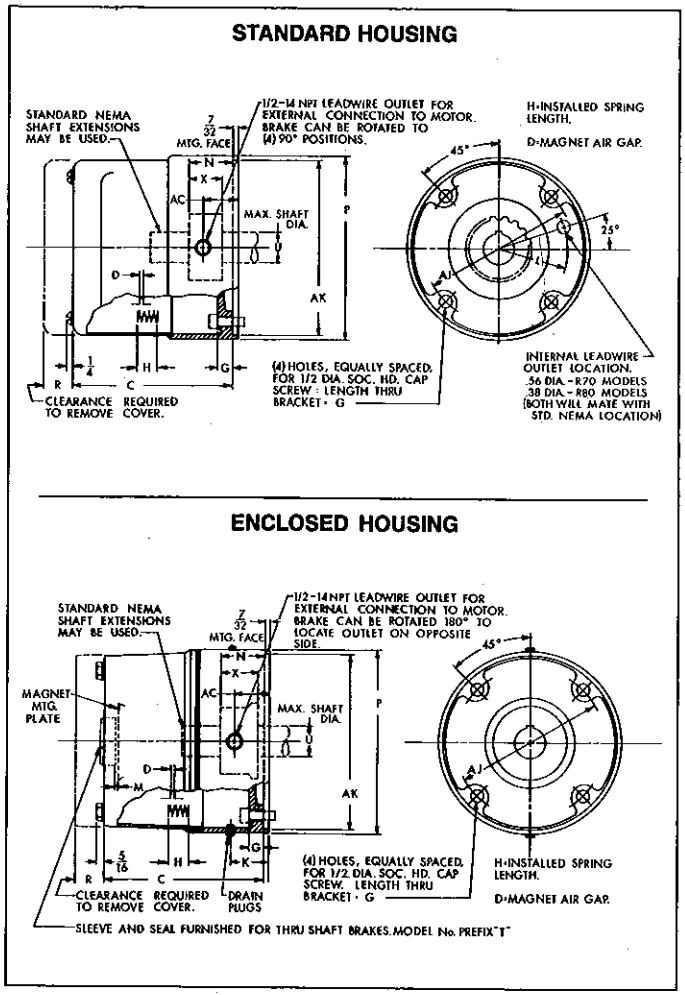


Figure 3.

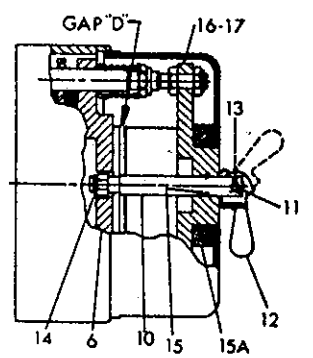


Figure 4.
Mark II Release

MAINTENANCE AND SERVICE

WEAR ADJUSTMENT

Refer to Figures 3 & 5, Tables 1 or 2

Magnet gap "D" increases as the rotating friction discs wear. When gap approaches "D" max., adjust gap to the "original setting," listed under "D," by turning nuts (21) and (22). The "original setting" is also the minimum allowed.

Too small a gap will not provide the proper running clearance, and will cause excessive wear and overheating of the rotating friction disc. The magnet gap can vary from "original setting" ± .005 between corners. After setting gap, readjust torque spring length per dimension "H."

CAUTION: MAGNET GAP MUST NOT EXCEED "D" MAXIMUM.

FRICTION DISC REPLACEMENT

Refer to Figures 3, 4 & 5, Tables 1 or 2

When rotating friction disc (4) wears down to a thickness of 7/32", replace disc.

1. Remove cover screws (24) and cover (23), plus "O" ring (28) and gasket (32) on enclosed models.
2. Standard release model: Unhook loop of torsion springs (11) from pins at rear of magnet plate (16). Remove release stop screws (14) washers (12) and shims (13). See Figure 5. Mark II release model: Remove cotter pin (13) and release lever (12). See Figure 4.
3. Remove adjusting lock nuts (22) magnet assembly (16), adjusting nuts (21), torque nuts (9), washers (8), torque spring (7) and pressure plate (6).
4. Remove friction disc (4) and stationary disc (5). Replace worn friction discs.
5. Reassemble all parts in reverse order. Set spring length "H" and magnet gap "D." Assemble manual release. See following paragraph.

MANUAL RELEASE ASSEMBLY

Refer to Figures 3, 4 & 5

When assembling a standard manual release mechanism (Figure 5), add only enough shim washers (13) to obtain proper release action. Too many shim washers will prevent automatic reset when electrical power is applied. Too few washers will prevent the motor shaft from turning freely. Replace stop screws (14). Wind each torsion spring (11) approximately 1/4 turn and hook spring loop over pin.

When assembling a Mark II manual release mechanism (Figure 4), attach lever (12) to release rod (10) with pin (11) and cotter pins (13). With lever (12) in raised position, rotate lever until pressure plate (6) makes contact with magnet assembly (16) closing gap "D." Lower the lever and turn counterclockwise 1/4 turn. The lever should now hang down, and if not, remove lever and relocate it close as possible to down position as holes in rod (10) allow. The lever must hang down because reset is by gravity (vertical mounted brakes have return springs).

To check release action, raise lever. Motor shaft should turn freely. Apply power. Lever should return to down position automatically. If shaft does not turn freely, turn lever clockwise 1/4 turn. Relocate lever to down position. If lever does not return automatically, turn lever counterclockwise 1/4 turn. Relocate lever to down position.

Table 1. Standard Housing

MODEL	TORQUE LB. FT.	WEIGHT LBS.	†THERMAL CAPACITY HPS/MIN	INERTIA WK² LB. FT.²	DIMENSIONS													
					C	D ±.005 MAX.	D ±.005 ORIGINAL SETTING	G	H	L	N ±1/32	P	R	U	X	AC	AJ	AK
R71010	10	35	11	.028	5.75	.060	.035	.75	1.31	3.812	1.15	9.25	4.00	1.375	1	1.47	7.25	8.500
R71015	15	35	11	.028	5.75	.060	.035	.75	1.31	3.812	1.5	9.25	4.00	1.375	1	1.47	7.25	8.500
R72025	25	40	12	.051	6.37	.060	.035	.75	1.31	3.812	2	9.25	4.00	1.375	1.5	2.09	7.25	8.500
R72035	35	40	12	.051	6.37	.065	.040	.75	1.22	3.812	2	9.25	4.00	1.375	1.5	2.09	7.25	8.500
R73050	50	45	13	.075	7.00	.065	.040	.75	1.25	3.812	2.5	9.25	4.00	1.375	2	2.72	7.25	8.500
R74070	70	50	14	.099	7.62	.065	.040	.75	1.22	3.812	3	9.25	4.00	1.375	2.5	3.34	7.25	8.500
R81025	25	50	*	.084	6.00	.065	.040	1	1.28	4.75	1.75	11.25	4.00	1.875	1	1.72	9.00	10.500
R81035	35	50	*	.084	6.00	.065	.040	1	1.28	4.75	1.75	11.25	4.00	1.875	1	1.72	9.00	10.500
R82050	50	55	*	.158	6.62	.065	.040	1	1.28	4.75	2.25	11.25	4.00	1.875	1.5	2.34	9.00	10.500
R82070	70	55	*	.158	6.62	.065	.040	1	1.28	4.75	2.25	11.25	4.00	1.875	1.5	2.34	9.00	10.500
R83075	75	60	*	.233	7.25	.070	.045	1	1.28	4.75	2.75	11.25	4.00	1.875	2	2.97	9.00	10.500
R83105	105	60	*	.233	7.25	.070	.045	1	1.28	4.75	2.75	11.25	4.00	1.875	2	2.97	9.00	10.500
R84125	125	66	*	.307	7.87	.080	.055	1	1.37	4.75	3.25	11.25	4.00	1.875	2.5	3.59	9.00	10.500
R85175	175	72	*	.384	8.50	.080	.055	1	1.28	4.75	3.87	11.25	4.00	1.875	3.12	4.22	9.00	10.500
SHAFT MUST BE CUT OFF AT N DIMENSION FOR BRAKES WITH MARK II RELEASE																		

Table 2. Enclosed Housing

MODEL	TORQUE LB. FT.	WEIGHT LBS.	†THERMAL CAPACITY HPS/MIN	INERTIA WK² LB. FT.²	DIMENSIONS														
					C	D ±.005 MAX.	D ±.005 ORIGINAL SETTING	G	H	K	M	N ±1/32	P	R	U	X	AC	AJ	AK
R71010-4	10	40	10	.036	5.75	.060	.035	.75	1.31	1.19	.25	1.5	9.25	4.25	1.375	1.31	1.47	7.25	8.500
R71015-4	15	40	10	.036	5.75	.060	.035	.75	1.31	1.19	.25	1.5	9.25	4.25	1.375	1.31	1.47	7.25	8.500
R72025-4	25	45	11	.059	6.37	.060	.035	.75	1.31	1.19	.25	2	9.25	4.25	1.375	1.81	2.09	7.25	8.500
R72035-4	35	45	11	.059	6.37	.065	.040	.75	1.22	1.19	.25	2	9.25	4.25	1.375	1.81	2.09	7.25	8.500
R73050-4	50	50	12	.083	7.00	.065	.040	.75	1.25	1.19	.25	2.5	9.25	4.25	1.375	2.31	2.72	7.25	8.500
R74070-4	70	55	13	.107	7.62	.065	.040	.75	1.22	1.19	.25	3	9.25	4.25	1.375	2.81	3.34	7.25	8.500
R81025-4	25	56	*	.095	6.00	.065	.040	1	1.28	1.44	.25	1.75	11.25	4.25	1.875	1.31	1.72	9.00	10.500
R81035-4	35	56	*	.095	6.00	.065	.040	1	1.28	1.44	.25	1.75	11.25	4.25	1.875	1.31	1.72	9.00	10.500
R82050-4	50	61	*	.169	6.62	.065	.040	1	1.28	1.44	.25	2.25	11.25	4.25	1.875	1.81	2.34	9.00	10.500
R82070-4	70	61	*	.169	6.62	.065	.040	1	1.28	1.44	.25	2.25	11.25	4.25	1.875	1.81	2.34	9.00	10.500
R83075-4	75	66	*	.244	7.25	.070	.045	1	1.28	1.44	.25	2.75	11.25	4.25	1.875	2.31	2.97	9.00	10.500
R83105-4	105	66	*	.244	7.25	.070	.045	1	1.28	1.44	.25	2.75	11.25	4.25	1.875	2.31	2.97	9.00	10.500
R84125-4	125	73	*	.318	7.87	.080	.055	1	1.37	1.44	.25	3.25	11.25	4.25	1.875	2.81	3.59	9.00	10.500
R85175-4	175	80	*	.395	8.50	.080	.055	1	1.28	1.44	.25	3.87	11.25	4.25	1.875	3.44	4.22	9.00	10.500
SHAFT MUST BE CUT OFF AT N DIMENSION FOR BRAKES WITH MARK II RELEASE																			

†Thermal capacity (HPS/MIN.) was determined under the following test conditions: a) Room temperature at 72°F. b) Stopping time of one second or less. c) Brake mounted in a horizontal position. d) Equal on and off times. e) 1800 RPM. f) Coil energized with 110% of rated voltage.
*Consult factory for thermal capacity.

Table 3. Parts List Mark II Release

ITEM NO.	PCS. REQ'D.	DESCRIPTION	R70000 SERIES PART NO.	R70000-4 SERIES PART NO.	R80000 SERIES PART NO.	R80000-4 SERIES PART NO.
6	1	Pressure Plate	K070076-001		K080029-001	
10	1	Manual Release Rod	G070076-001	G070076-002	G070076-001	G070076-002
11	1	Pin	W005002-004		W005002-004	
12	1	Lever	H020005-001		H020005-001	
13	2	Cotter Pin	W005001-003		W005001-003	
14	1	Locknut (ESNA)	W003001-020		W003001-020	
15	1	O-Ring	---	W006001-014	---	W006001-014
15A	1	Bushing Seal	---	G070301-002	---	G070301-002
16	1	Magnet Assembly Complete with coils	SEE ORDERING INFORMATION ON PAGE 6			
17 17A	1	Magnet Plate W/O Coils	K070073-001 (3-Phase) K070074-001 (Single Phase)		K080033-001 (3 Phase) K080031-001 (Single Phase)	
Items 29, 30 & 31 are not used.						

MAXIMUM SPEED FOR ALL MODELS IS 3600 RPM

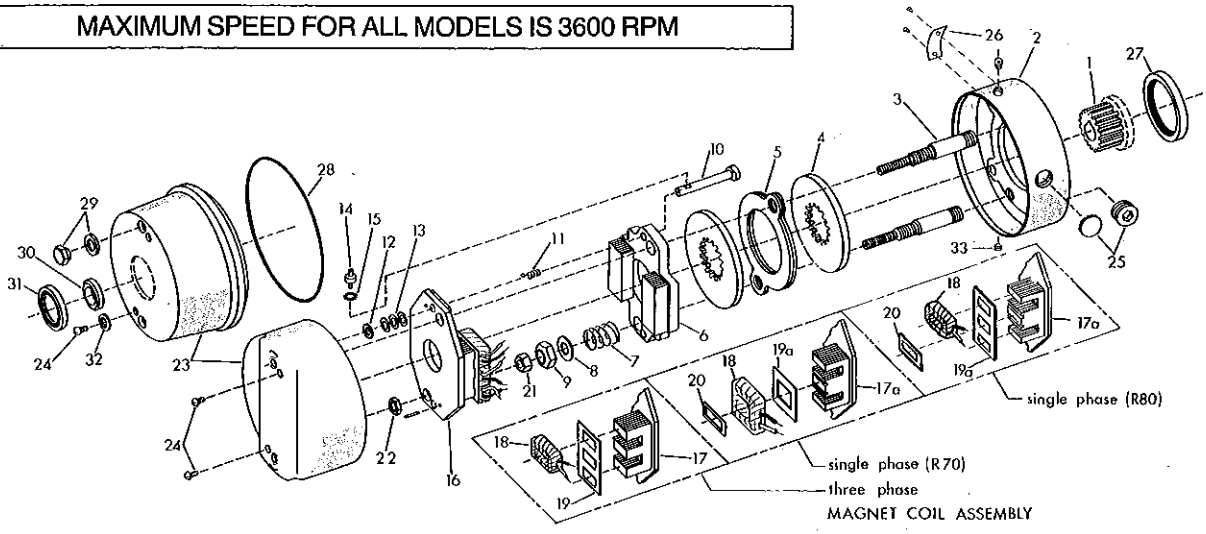


Figure 5. Exploded View of Brake

Table 4. Parts List

ITEM NO.	PCS. REQ'D.	DESCRIPTION	R70000 SERIES PART NO.	R70000-4 SERIES PART NO.	R80000 SERIES PART NO.	R80000-4 SERIES PART NO.
1	1	Hub	Specify shaft diameter and keyway.			
2	1	Bracket W/Studs — 1 Disc	H070135-001	H070141-001	H080077-001	H080079-001
2	1	Bracket W/Studs — 2 Disc	H070135-002	H070141-002	H080077-002	H080079-002
2	1	Bracket W/Studs — 3 Disc	H070135-003	H070141-003	H080077-003	H080079-003
2	1	Bracket W/Studs — 4 Disc	H070135-004	H070141-004	H080077-004	H080079-004
2	1	Bracket W/Studs — 5 Disc	---	---	H080077-005	H080079-005
2A	1	Bracket W/High Tensile Studs — 1 Disc	H070135-005	H070141-005	H080077-006	H080079-006
2A	1	Bracket W/High Tensile Studs — 2 Disc	H070135-006	H070141-006	H080077-007	H080079-007
2A	1	Bracket W/High Tensile Studs — 3 Disc	H070135-007	H070141-007	H080077-008	H080079-008
2A	1	Bracket W/High Tensile Studs — 4 Disc	H070135-008	H070141-008	H080077-009	H080079-009
2A	1	Bracket W/High Tensile Studs — 5 Disc	---	---	H080077-010	H080079-010
3	2	Stud — 1 Disc	G070213-001		G070213-001	
3	2	Stud — 2 Disc	G070213-002		G070213-002	
3	2	Stud — 3 Disc	G070213-003		G070213-003	
3	2	Stud — 4 Disc	G070213-004		G070213-004	
3	2	Stud — 5 Disc	---		G070213-005	
3A	2	Stud — High Tensile 1 Disc	G070219-001		G070219-001	
3A	2	Stud — High Tensile 2 Disc	G070219-002		G070219-002	
3A	2	Stud — High Tensile 3 Disc	G070219-003		G070219-003	
3A	2	Stud — High Tensile 4 Disc	G070219-004		G070219-004	
3A	2	Stud — High Tensile 5 Disc	---		G070219-005	
4	*	Rotating Friction Disc (Non-asbestos)	H070103-004		H080002-002	
4A	*	Rotating Disc Heavy Duty (Alternate)	H070047-003		H080026-003	
5	**	Stationary Disc	H070089-001		K080001-003	
6	1	Pressure Plate	K070045-001		K080012-001	
7	2	Torque Spring	G070011-001 (10 Ft. Lb.) G070019-001 (25 Ft. Lb.) G070012-001 (All Others)		G080001-001 Models 81025, 82050, 83075 G080002-001 (All Others)	
8	2	Torque Spring Washer	W004004-001		W004004-001	

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Table 4. Continued

ITEM NO.	PCS. REQ'D.	DESCRIPTION	R70000 SERIES PART NO.	R70000-4 SERIES PART NO.	R80000 SERIES PART NO.	R80000-4 SERIES PART NO.
9	2	Torque Adjusting Nut (ESNA)	W003001-002		W003001-022	
10	2	Manual Release Rod	G070001-002		G070001-002	
11	2	Manual Release Spring	G060010-001		G060010-001	
12	2	Manual Release Washer	W004004-003		W004004-003	
13	A.R.	Manual Release Shim	W004004-004		W004004-004	
14	2	Manual Release Stop Screw	G060029-001		G060029-001	
15	2	Manual Release Lockwasher	W004007-007		W004007-007	
16	1	Magnet Assembly, Complete with Coils	See Ordering Information on Page 6			
17	1	Magnet Plate W/O Coils 3 Phase	K070024-001		K080014-001	
17A	1	Magnet Plate W/O Coils Single Phase	K070027-001		K080015-001	
18	***	Magnet Coil	See Ordering Information on Page 6			
19	2	Insulating Washer 3 Phase	G070037-001		G080016-001	
19A	2	Insulating Washer Single Phase	G070029-001		G080148-001	
20	2	Shading Coil (Single Phase Only)	G070032-001		G080022-001	
21	2	Gap Adjusting Nut	W003003-023		W003003-023	
22	2	Gap Adjusting Locknut (ESNA)	W003001-020		W003001-020	
23	1	Cover	K070080-001	K070104-001	K080023-001	K080048-002
24	2	Cover Screw	W001004-012	W001002-103	W001004-012	W001002-103
25	1	Conduit Hole Plug	W008003-001	W010002-004	W008003-001	W010002-004
26	1	Nameplate with Screws	SPECIFY DATA			
27	1	Hub Seal	---	W011001-007	---	W011001-008
28	1	"O" Ring Seal	---	W006001-010	---	W006001-011
29	2	Release Cap	---	G060170-002	---	G060170-002
		Gasket	---	G070381-001	---	G070381-001
30	1 ****	Thru-Shaft Sleeve (Specify Bore & Keyway)	---	H070080	---	H080036
31	1 ****	Thru-Shaft Seal	---	W011001-006	---	W011001-007
32	2	Cover Screw Gasket Stat-O-Seal	---	W011002-005	---	W011002-005
33	2	Drain Hole Pipe Plug	---	W010002-001	---	W010002-001

* Number of Rotating Discs is shown as second digit of Model No.: Example - R72025
** Number of Stationary Discs is one less than number of Rotating Discs.
*** 3 phase brake requires six coils. Single phase R70 require two coils. Single phase R80 require four coils.
**** For models with prefix "T" (thru shaft) only.

MAGNET COIL REPLACEMENT

Refer to figures 5 & 6.

Remove magnet assembly as outlined under FRICTION DISC REPLACEMENT.

Coils (18) are held in place with epoxy cement. Force coil off magnet mounting plate and remove excess epoxy from all surfaces.

Replacement coils should be held in place with new epoxy cement. The epoxy cement should be heat resistant and shock resistant. Place an insulating washer (19 or 19A) below the coils. Order insulating washers when ordering coils. An insulating washer can be cut to suit when replacing only one coil on a multiple coil assembly.

When installing coils, it is very important to follow EXACTLY the sequence of black and light colored leads as shown in wiring diagram (Figure 2). The brake will not operate properly unless coils are all in the correct position.

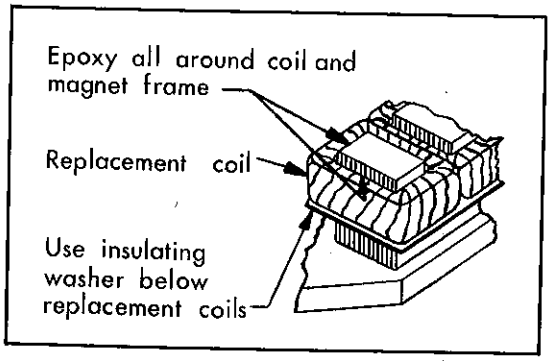


Figure 6. Fastening of Replacement Magnet Coils

TROUBLE SHOOTING

A. **IF BRAKE DOES NOT RELEASE:**

1. Check brake visually for broken or damaged parts.
2. Check for broken leadwire or bad electrical connection.
3. Check for correct voltage. Line voltage must correspond to the voltage for which the brake coils are connected. If the line voltage is more than 10% below the voltage for which the brake coils are connected, the magnet will not pull in, causing the coils to burn out within minutes. If the line voltage is more than 10% above the voltage for which the brake coils are connected, the coils will overheat and burn out.
4. Check for burned-out coils (coils may be charred or burned).
5. Check for excessive magnet gap. (See WEAR ADJUSTMENT.)
6. Check for failure of power supply to brake.

B. **IF BRAKE DOES NOT STOP:**

1. Check brake visually for broken or damaged parts.
2. Make certain hub has not shifted position on the motor shaft and that all rotating discs are fully engaged on the hub.
3. Check that the manual release is in the normal position.
4. Check disc wear. (See WEAR ADJUSTMENT.)

C. **IF BRAKE CHATTERS OR HUMS:**

1. See that magnet faces are clean. To remove dirt, insert a clean sheet of paper between magnet faces and energize brake. Move paper around between faces to dislodge dirt, then remove paper.
2. Check for low voltage. Magnet will not pull in, and coils will burn out if line voltage is beyond 10% below the voltage the brake coils are connected for.
3. See that magnet faces are parallel within tolerance. Readjust magnet gap to "D" min. (See WEAR ADJUSTMENT.)
4. Check if shading coil (20) is cracked, broken or out of position (single phase only).

D. **IF MANUAL RELEASE DOES NOT WORK:**

1. Check for broken or damaged parts.
2. Check return spring (11). Brake will not reset automatically if this spring is broken.
3. Check magnet gap with brake in released position. (See MANUAL RELEASE ASSEMBLY.)
4. Check quantity of shim washers (13) under release stop screws. (See MANUAL RELEASE ASSEMBLY.)

SPECIFICATIONS

MOTOR FRAMES 70 Series — 182TC, 184TC, 213TC, 215TC, 254TC, 256TC. 80 Series — 284TC, 286TC.

HOUSINGS Standard is cast iron and aluminum. Enclosed is all cast iron.

DUTY Rated for continuous duty.

VOLTAGES All standard NEMA voltages and frequencies available. Other voltages and frequencies are optional.

MOUNTING Direct to NEMA "C" motor flanges. Adaptors for larger or smaller frames, foot mounting and vertical mounting are available.

SHAFTS NEMA standard length motor shafts and thru shafts may be used on all models except units with Mark II Release (Cover modification required for thru shafts).

ORDERING INFORMATION

The following data should be furnished with your order for:

REPLACEMENT PARTS
Brake Model Number
Part Number from Tables
Part Description from Tables
(On hub order furnish bore dia. & keyway dimensions.
On electrical parts specify voltage, phase & frequency.)

REPLACEMENT BRAKE
Model Number
Voltage, Phase & Frequency
Hub Bore & Keyway Dimensions
Mounting — Horizontal or Vertical. (If vertical, specify whether above or below motor. If brake includes foot mounting bracket or adaptor, specify.)

LOCAL ASSISTANCE

Local assistance is available by a sales representative or distributor in most areas of the USA and Canada. Look in the Yellow Pages phone directory under Brakes Mfrs & Distrs., or call us at the factory at 414-672-7830 between 8:00AM and 4:30PM Milwaukee time (central time) Monday through Friday. Tell our operator that you want to get the name, location and phone number of a Dings Dynamics distributor or sales representative in your area.

Dings DYNAMICS GROUP