



CLASS 5010 TYPE F-30 30" WB BRAKE SERIES A A5-0909-_____

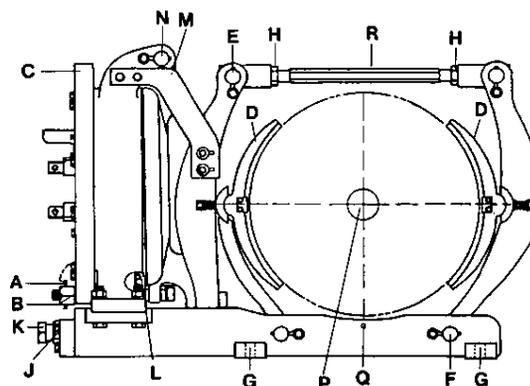
DESCRIPTION

The Class 5010 WB brake is a spring set, electrically released, shoe type friction brake. It is designed to meet AISE Standard No. 11 and NEMA Standard ICS 2-220 for torque rating, wheel diameter, mounting dimensions and electrical operating characteristics.

Maximum Brake Torque Ratings in Ft. Lbs.				
Series-Wound Brakes		Shunt-Wound Brakes		
1/2 Hour Rating	1 Hour Rating	1 Hour Rating	8 Hour Rating	High Speed and Rectifier Operated
9000	6000	9000	6750	9000

The torque setting for the standard brake can be adjusted down to 50% of the maximum rating.

The Class 5010 WB brake is used with dc motors and provides a fixed torque for holding or stopping the drive. The brake is supplied with either a dc series wound coil or a dc shunt wound coil. Shunt wound brakes use a partial voltage coil and require that a shunt brake relay panel be used. This relay panel consists of a brake protective relay, brake contactor and a protective resistor. A separate brake relay must also be supplied to control the high speed relay panel.



FOR PARTS IDENTIFIED BY A LETTER, SEE THE BRAKE GENERAL ARRANGEMENT DRAWING ABOVE. FOR PARTS IDENTIFIED BY A NUMBER, SEE THE BRAKE EXPLODED VIEW DRAWING .

DC series wound operating coils are designed to release the brake at 40% of rated motor current and to hold the brake released at 10% of rated motor current.

DC shunt wound operating coils are designed to release the brake at 80% of rated voltage and operate continuously at 110% of rated voltage.

BRAKE COIL APPLICATION TABLE

SERIES BRAKE TYPE	COIL PART NO.	OHMS RESISTANCE @ 20°C	1/2 HOUR SERVICE @ 230VDC		1 HOUR SERVICE @ 230VDC	
			AMPERE RATING	HP RATING	AMPERE RATING	HP RATING
F-3006	C50909-016-54	.00381	818	230	631	175
F-3005	C50909-016-55	.00220	1077	300	831	230
F-3004	C50909-016-56	.00136	1371	380	1058	290
F-3003	C50909-016-57	.00117	1475	410	1138	315
F-3002	C50909-016-58	.000778	1815	505	1400	390

SHUNT BRAKE RESISTORS AND RELAY FOR 230VDC						
SHUNT BRAKE TYPE	COIL PART NO.	OHMS RES. @ 20°C	DC VOLTAGE RATING		HIGH SPEED SERVICE	
			1 HR.	8 HR.	RESISTOR CLASS & TYPE	RELAY CLASS & TYPE
F-3051	C50909-017-52	1.463	55	31	Class 6715 Type TW16D	Class 7001 Type K10-1 & Class 7004 Type MXD0-1 Contactor

INSTALLATION

1. Unpack brake carefully.
2. Check nameplate data for correct equipment. Check that brake coil is correct. Refer to brake coil application table.
3. Check that all parts are undamaged and secure.
4. Check that brake wheel size and dimensions are correct (part number stamped on face of hub).
5. Mount wheel on motor shaft.
6. Check that the brake has been manually released by removing cotter pin (A) from manual release nut (B) and tightening the manual release nut until armature (17) is completely closed.
7. Using the lifting ear (C) on the magnet case cover, install brake by sliding into position with wheel centered between shoes (D).
8. Where machinery interference prevents sliding brake over end of wheel, brake can be disassembled and moved into position laterally as follows:

Remove connecting rod pin (E) and shoe lever pin (F) with locking pins and remove shoe lever, shoe, and connecting rod assembly from brake. Move brake into position, reassemble and insert pins. Replace all locking pins and tighten screws.
9. Mount brake so center of brake wheel (P) coincides with intersection of a horizontal line passing through centers of the shoes and a vertical line passing through hole (Q) located on side of brake frame below wheel.
10. Align brake so shoes (D) are centered on face of wheel and brake is perpendicular to motor shaft.

NOTE: THE BRAKE WILL AUTOMATICALLY ADJUST FOR ± 1/8" MISALIGNMENT WITH RESPECT TO THE VERTICAL LINE. BRAKE MUST BE ACCURATELY POSITIONED WITH RESPECT TO THE HORIZONTAL LINE.

11. Fasten base of brake down securely using four mounting holes (G). Additional support is not normally required under the magnet case. Back off manual release nut (B) to original position and secure with cotter pin (A).
12. Check wiring diagram before connecting brake coil leads.

CAUTION

SHUNT WOUND BRAKES USE A PARTIAL VOLTAGE COIL AND REQUIRE THAT A RESISTOR BE CONNECTED IN SERIES WITH THE BRAKE COIL. FAILURE TO CONNECT THE RESISTOR WILL RESULT IN A COIL OVERVOLTAGE CONDITION.

DANGER

HAZARD OF ELECTRICAL SHOCK OR BURN. ALL POWER MUST BE DISCONNECTED FROM THE BRAKE BEFORE PERFORMING ANY ADJUSTMENT, MAINTENANCE, OR DISASSEMBLY PROCEDURES.

ADJUSTMENTS

ARMATURE GAP ADJUSTMENT

The armature gap indicator (L) mounted on the frame near the bottom of the magnet case indicates both minimum and maximum allowable armature gap setting (Fig.1).

NOTE: THE ARMATURE GAP INDICATOR (L) CAN BE MOUNTED ON EITHER SIDE OF MAGNET CASE; WHICHEVER IS CONVENIENT FOR THE PARTICULAR INSTALLATION.

To adjust the armature gap loosen both lock nuts (H), one on each end of connecting rod (R) and turn the connecting rod until the armature is in line with the "minimum gap" notch on the gap indicator plate. Retighten the two locknuts.

SHOE CLEARANCE ADJUSTMENT

The proper shoe clearance between the wheel and shoe should be 1/32" at the center line of the shoe. There will be a larger gap at the top of the shoe and a smaller gap at the bottom, due to the rigid mounted shoes.

To check actual clearances between the brake shoe and wheel, manually release the brake by tightening the manual release nut (B) until the armature is firmly seated against the magnet case. A brake adjustment can now be made based on a normal shoe to wheel gap of 1/32", measured at the center line of the brake shoe. Adjustment is made by turning the connecting rod as described in ARMATURE GAP ADJUSTMENT. If the shoe to wheel gaps are not 1/32" at each shoe, operate the brake a few times to allow the automatic self centering feature to equalize the gaps. Shoe gap should not exceed 5/64".

To return brake to normal operation, back off manual release nut (B) and secure in non-operative position using cotter pin (A) to prevent loss of release nut, or possible interference with normal brake operation.

TORQUE ADJUSTMENT

The brake torque is adjusted by the bolt (K) under the magnet case.

1. Loosen torque adjusting screw lock nut (J).
2. Turn the torque adjusting screw (K) to give the desired dimension measured from the head of the screw to the frame. A table is listed on the calibration plate on the magnet case.

BRAKE TORQUE (LBS IN)	SETTING
1000	3 1/2
6000 1/2 HP SERIES	2 1/16
7000	2 1/4
8000	2

3. Tighten lock nut (J).

CAUTION

AFTER ANY ADJUSTMENTS, MAINTENANCE OR TROUBLESHOOTING, CHECK THAT THE MANUAL RELEASE NUT (B) HAS BEEN BACKED OFF TO ORIGINAL POSITION AND IS SECURED WITH COTTER PIN (A).

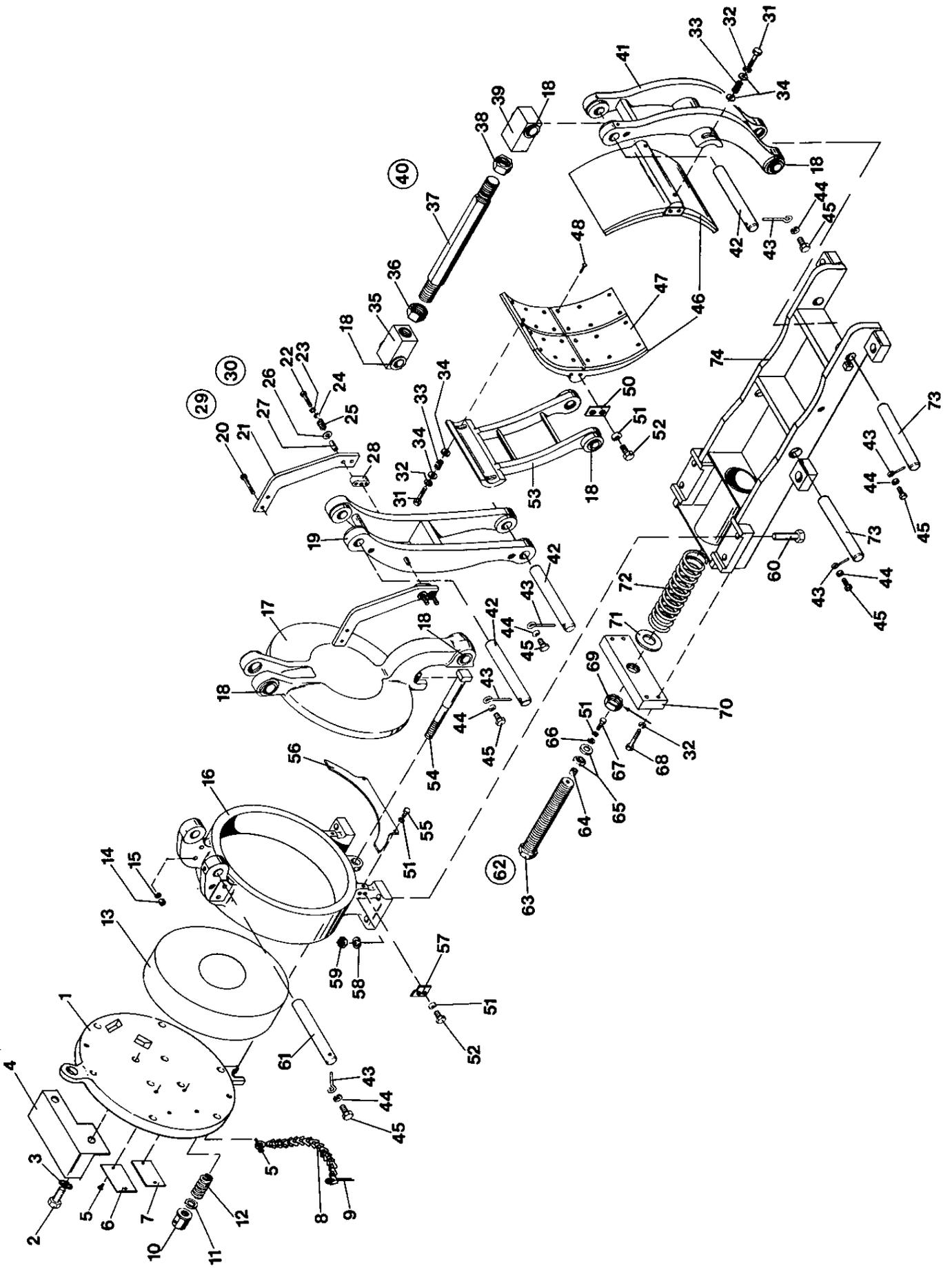
PARTS LIST FOR CLASS 5010 TYPE F-30 30" WB BRAKE SERIES A A5-0909-

Item No.	Part No. ■	Description	Item No.	Part No. ■	Description
1	C50909-013-01	Magnet Case Cover	40	B50909-005-50	Connecting Rod Assembly (Includes Items 35-39)
2		3/8" - 11 x 3 3/8" Hex Head Screw, (12 Req'd.)	41	C50909-008-50	Shoe Lever Assembly, Outboard, Complete with Bearings
3	B50909-020-01	Terminal Shield	42	B50903-401-20	Pin (Connecting Rod and Inner Lever), (3 Req'd.)
4		#6 x 3/8" Drive Screw, (5 Req'd.)	43	B50903-402-04	Locking Pin, (6 Req'd.)
5	A51139-094-01	Engr. N.P. (per spec)	44		3/8" Lock Washer, (6 Req'd.)
6	A51139-040-04	Calibration Plate	45		3/8" - 11 x 1 1/4" Hex Head Screw, (6 Req'd.)
7		Sash Chain, 1 ft.	146	C50909-004-50	Brake Shoe Assembly, (2 Req'd.) (Without Brake Blocks)
8		3/16 x 2 1/2" Cotter Pin	47	B50903-808-57	Brake Block Kit (Includes Linings and Rivets for 2 Shoes)
9	B51001-067-06	Manual Release Nut	48		3/16" - 18 x 1" Brass Nylok Flat Head Machine Screw, (48 Req'd.)
10	B50502-003-32	Washer (Manual Release Screw)	149	B50909-003-50	Brake Shoe Assembly (Includes Items 46-48), (2 Req'd.)
11	B50502-601-12	Spring (Manual Release Screw)	50	A50909-001-01	Lining Wear Indicator, (2 Req'd.)
12		Coil Assembly	51		3/8" Lock Washer, (9 Req'd.)
13	C50909-016	3/8" - 11 Jam Nut, (4 Req'd.)	52		3/8" - 16 x 3/8" Hex Head Screw, (6 Req'd.)
14		3/8" Lock Washer, (4 Req'd.)	53	C50909-010-50	Shoe Support Lever Assembly, Includes Bearings
15		Magnet Case	54	A51007-021-01	Manual Release Screw
16	C50909-014-01	Magnet Case	55		3/8" - 16 x 1/2" Hex Head Screw, (2 Req'd.)
17	C50909-011-51	Armature Assembly, Complete with Bearing, Item 18.	56	A51007-035-01	Non-magnetic Spacer
18	29005-80830	Bearing, (12 Req'd.)	57	A50909-015-01	Armature Cap Indicator
19	C50909-009-50	Shoe Lever Assembly, Inner	58		1" Lock Washer, (4 Req'd.)
20		3/8" - 11 x 3 3/8" Hex Head Screw, (4 Req'd.)	59		1" - 8 Nut, (4 Req'd.)
21	B51007-094-01	Bracket, (2 Req'd.)	60		1" - 8 x 5" Hex Head Screw, (4 Req'd.)
22		3/8" - 13 x 3" H. St. Nylon Cap Screw, (4 Req'd.)	61	B50903-401-13	Armature Pin
23		3/8" Lock Washer, (4 Req'd.)	62	A51007-027-51	Torque Screw Assembly (Includes Items 63-67 & 51)
24		3/8" Flat Washer, (4 Req'd.)	63	A51007-027-02	Torque Screw
25	B50502-601-13	Spring, (4 Req'd.)	64	B50502-051-28	Spacer
26		3/8" Flat Washer, (4 Req'd.)	65	23690-01580	Thrust Washer (Spherical, 2 pc set)
27	B50502-052-16	Spacer, (4 Req'd.)	66	B50502-003-30	Washer
28	A51007-046-01	Bearing, (2 Req'd.)	67		3/8" - 10 x 1 1/4" Hex Head Screw, (4 Req'd.)
29	A51007-030-50	Virtual Center Assembly, Right Hand (Including Parts 21-28)	68		3/8" - 10 x 3 3/8" Hex Head Screw, (4 Req'd.)
30	A51007-030-51	Virtual Center Assembly, Left Hand (Including Parts 21-28)	69	B50502-551-03	2 1/4" - 8 Lock Nut
31	B50502-526-17	3/8" - 16 x 4 1/4" Special Cap Screw, (4 Req'd.)	70	A51007-027-01	Torque Screw Plate
32		3/8" Lock Washer, (8 Req'd.)	71	B50502-003-31	Spring Thrust Plate
33	B50502-601-38	Shoe Spring, (4 Req'd.)	72	A51007-040-01	Operating Spring
34		3/8" Flat Washer, (8 Req'd.)	73	B50903-401-21	Outer Lever & Support Lever Pin, (2 Req'd.)
35	B50909-006-50	Connecting Rod Link, R.H. Thread, Including Bearings	74	C50909-007-50	Frame Assembly
36	23003-00500	1 1/2" - 6 Jam Nut, R.H. Thread			
37	B50909-005-01	Connecting Rod			
38	A50903-427-01	1 1/2" - 6 Jam Nut, L.H. Thread			
39	B50909-006-51	Connecting Rod Link, L.H. Thread, Including Bearings			

■ Standard hardware, listed without a Square D part number, should be obtained from a local hardware supplier.

★ Advise coil part number or nameplate data.

† Parts Recommended for General Maintenance.



MAINTENANCE

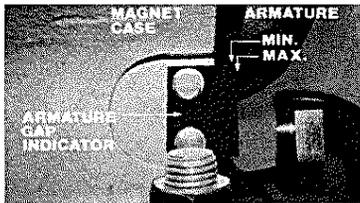
LUBRICATION

As standard these brakes include grease fittings. To extend service life on cranes with severe service environments, the brakes should be lubricated periodically as needed, or once per year at minimum.

SHOE LINING WEAR

As linings wear, armature gap increases. With the brake set, the armature gap is correct when the inside of the armature aligns with the slotted step of the armature gap indicator (L). The maximum allowable gap is indicated by the end of the armature gap indicator (L) (Fig. 1).

A Lining Wear Indicator (50) mounted on the shoe assembly is used to indicate shoe lining wear. When the edge of this indicator aligns with the shoe lining surface, the linings must be replaced.



ARMATURE GAP INDICATOR

Figure 1

BRAKE SHOE AND LINING REPLACEMENT

1. Manually release brake by removing cotter pin (A) from manual release nut (B) and tightening the manual release nut (B) until armature is completely closed.
2. For each shoe, remove two hex head cap screws (31) and springs (33).
3. Slide shoes (D) out from either side of brake. Linings are riveted on. Replacement lining kits are available. Refer to Parts List in this Service Bulletin for part number of kit.
4. Replace shoes, springs and hex head cap screws. Tighten hex head cap screws firmly.
5. Readjust the armature air gap as explained under ADJUSTMENT—Shoe Clearance.
6. Back off manual release nut (B) to original position and secure with cotter pin (A).
7. The torque setting is not affected by brake shoe removal.

COIL REPLACEMENT

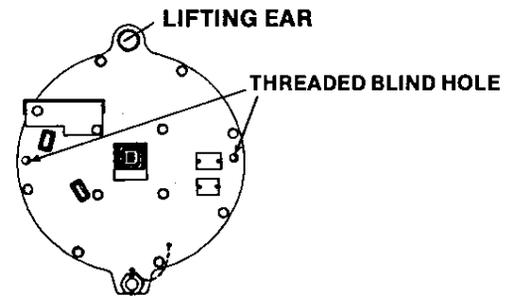
The coil and coil core are encapsulated. The operating coil is removable from the rear of the magnet case. The brake need not be released and the brake settings are not changed when the coil is removed. Normally, it is not necessary to remove the brake to change the coil. If necessary, the magnet case can be removed from the brake to change the coil.

To remove the magnet case from the brake, remove the bolts (20) and nuts (14) and the centering bracket (M). Also remove the locking pin and armature pin (N). The magnet case can be lifted from the brake after removing the four hex head cap screws (60), and disconnecting the coil leads.

To remove the coil in the magnet case, perform the following steps in the order listed:

DANGER
HAZARD OF ELECTRICAL SHOCK OR BURN.
ALL POWER MUST BE REMOVED FROM BRAKE
BEFORE PERFORMING DISASSEMBLY PROCEDURE.

1. Disconnect the coil leads.
2. Remove the eight hex head cap screws (2) and lock washer around the outer edge of the magnet case cover (1).
3. Screw hex head cap screws (2) into the two threaded blind holes in the magnet case cover (1) to break the magnet case cover and coil and coil core assembly (13) loose from the magnet case (16) (Fig. 2).



REAR OF MAGNET CASE

Figure 2

CAUTION
THE COIL ASSEMBLY FOR THIS BRAKE WEIGHS 560 LBS.

4. A lifting ear (C), located on the magnet case cover aids in removing the coil assembly. Slide coil and core assembly (13) out of the magnet case.
5. Remove the four hex head cap screws (2) in center of magnet case cover. Remove terminal shield (4) and magnet case cover (1).
6. Check that part number of new coil is correct. Refer to Brake Coil Application Table.
7. Place the coil and coil core (13) so that the back of the coil is horizontal with the coil leads extending vertically (Fig. 3).



COIL AND CORE ASSEMBLY

Figure 3

8. Position the magnet case cover (1) on top of the coil assembly.
9. Replace terminal shield (4) and secure with four hex head cap screws (2).
10. Replace magnet case cover and coil and core assembly into magnet case using eight hex head cap screws (2) and lock washers (3).
11. Reassemble magnet case (16) on brake.

BRAKE WHEEL REPLACEMENT

To remove the brake wheel from the motor shaft, the brake must be released. Manually release brake by removing cotter pin (A) from manual release nut (B) and tightening the manual release nut until armature (16) is completely closed.

If the brake wheel and motor armature are to be replaced as a unit, the brake must be disassembled following step 8 in Installation Section.

TROUBLESHOOTING

Refer to brake coil application table for coil rating and shunt brake resistor data.
 Refer to the brake torque rating table for brake application data.

TROUBLE	POSSIBLE CAUSE	REMEDY
Brake will not release.	<ol style="list-style-type: none"> 1) Improper or defective coil 2) Brake out of adjustment 3) Mechanical interference 4) Improper application 	<ol style="list-style-type: none"> 1) Check coil part number and resistance to determine if coil is defective. 2) Check armature gap setting and insure that foreign material is not preventing armature from closing. 3) Check for mechanical binding of armature, shoe lever assemblies. 4) Check motor rating to verify coil selection.
Brake releases and then sets.	<ol style="list-style-type: none"> 1) Improper or defective coil 2) Improper application 	<ol style="list-style-type: none"> 1) Check coil part number and resistance to determine if coil is defective. 2) Check motor rating to verify coil selection.
Sluggish Operation	<ol style="list-style-type: none"> 1) Improper or defective coil 2) Brake out of adjustment 3) Mechanical interference 	<ol style="list-style-type: none"> 1) Check coil part number and resistance to determine if coil is defective. 2) Check armature gap setting and insure that foreign material is not preventing armature from closing. 3) Check for mechanical binding of armature, shoe lever assemblies.
Brake Wheel Overheats or Cracks	<ol style="list-style-type: none"> 1) Brake out of adjustment 2) High Duty Cycle 3) Mechanical interference 	<ol style="list-style-type: none"> 1) Check armature gap setting and insure that foreign material is not preventing armature from closing. 2) Check motor torque rating to verify brake selection. 3) Check for mechanical binding of armature, shoe lever assemblies.
Operating Coil Overheats	<ol style="list-style-type: none"> 1) Improper coil 2) Defective coil 3) High Duty Cycle 4) Incorrect or omitted shunt brake resistor 	<ol style="list-style-type: none"> 1) Check coil part number and motor rating to verify coil selection. 2) Check coil resistance to determine if coil is defective. 3) Check motor torque rating to verify brake selection. Check duty rating of brake coil. 4) Check that shunt brake coil is connected in series with shunt brake resistor. Check shunt brake resistor part number and application.
Excessive Lining Wear	<ol style="list-style-type: none"> 1) Brake out of adjustment 2) High Duty Cycle 3) Mechanical interference 	<ol style="list-style-type: none"> 1) Check armature gap setting and insure that foreign material is not preventing armature from closing. 2) Check motor torque rating to verify brake selection. 3) Check for mechanical binding of armature, shoe lever assemblies.