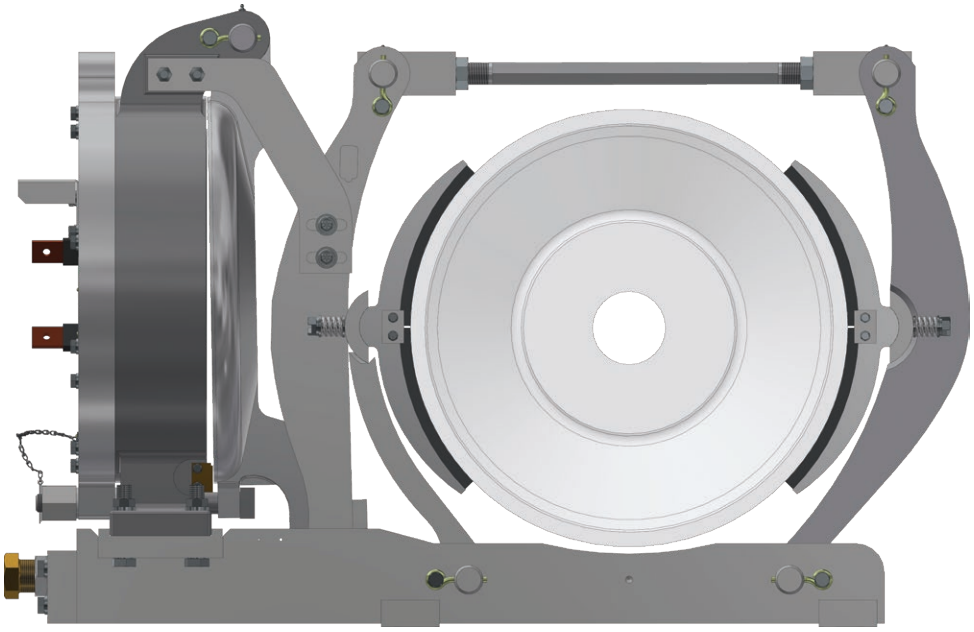
Drum Brakes
Class 5010, Type F

30-Inch WB Brake, Series A

5010-17 Effective February 2025 Supersedes 5010-17, dated June 1983



Introduction

5010-17 Effective February 2025
Supersedes 5010-17, dated June 1983

The Class 5010 WB brake is a spring-set, electrically released, shoe-type friction brake. It is designed to meet AIST Standard No. 11 and NEMA Standard ICS 9 Part 1 for torque rating, wheel diameter, mounting dimensions, and electrical operating characteristics.

⚠ DANGER ⚠

HAZARDOUS VOLTAGE

Disconnect all power before servicing this equipment.

Failure to follow this instruction will result in death, serious injury, or equipment damage.

⚠ WARNING ⚠

STORED ENERGY HAZARD

- The torque spring is under compression.
- Perform the disassembly and assembly steps in the exact order listed.

Failure to follow these instructions can result in death or serious injury.

Specifications

Table 1: Maximum Brake Torque Rating (lb-ft.)

Brake Size (in.)	Series-Wound Brakes		Shunt-Wound Brakes		
	1/2-Hour Rating	1-Hour Rating	1-Hour Rating	8-Hour Rating	High-Speed and Rectifier Operated
30	9000	6000	9000	6750	9000

Table 1 shows the maximum brake torque ratings. The torque setting for the standard brake can be adjusted down to 50% of the 9000 lb-ft maximum rating.

The Class 5010 WB brake, when used with either AC or DC motors, 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 connection of a shunt brake resistor in series with the brake coil. AC applications require a rectifier control panel.

DC series-wound 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 coils are designed to release the brake at 80% of rated voltage and operate continuously at 110% of rated voltage. For application information see Tables 2 through 4.

Table 2: Application Table for Shunt Brake Coils

Brake	Coil	Resistance @ 20°C (Ω)	DC Voltage Rating (Vdc)*		Shunt Brake Resistors and Relay for High-Speed Shunt Brake Service, 230 Vdc	
			1 Hour	8 Hour	High-Speed Service Resistor	High-Speed Service Relay / Contactor
F3051	HCE50909-017-52	1.463	55	31	HCE51283-411	Class 7001 Type KIO-11 F30 & 7004MXDO1230V

**Consult factory for standard Shunt Brake coils*

Table 3: Application Table for Rectifier-Operated Brake Coils

Brake Size (inches)	Brake	Coil	Resistance @ 20°C (Ω)	DC Voltage Rating (Vdc)		Rectifier-Operated Application
				1 Hour	8 Hour	
30	F3052	HCE50909-017-53	2.371	70	40	Single brake coil
	F3050	HCE50909-017-51	0.922	43	25	Dual Brakes, two brake coils connected in series

Table 4: Application Table for Series Brake Coils

Brake Size (inches)	Brake	Coil	Resistance @ 20°C (Ω)	1/2-Hour Service @ 230 Vdc		1-Hour Service @ 230 Vdc	
				Ampere Rating	Horsepower Rating	Ampere Rating	Horsepower Rating
30	F3002	HCE50909-016-58	0.000778	1815	505	1400	390
	F3003	HCE50909-016-57	0.00117	1475	410	1138	315
	F3004	HCE50909-016-56	0.00136	1371	380	1058	290
	F3005	HCE50909-016-55	0.00220	1077	300	831	230
	F3006	HCE50909-016-54	0.00381	818	230	631	175
	F3007	HCE50909-016-53	0.00511	707	200	545	150

Note: Contact Factory for additional coils.

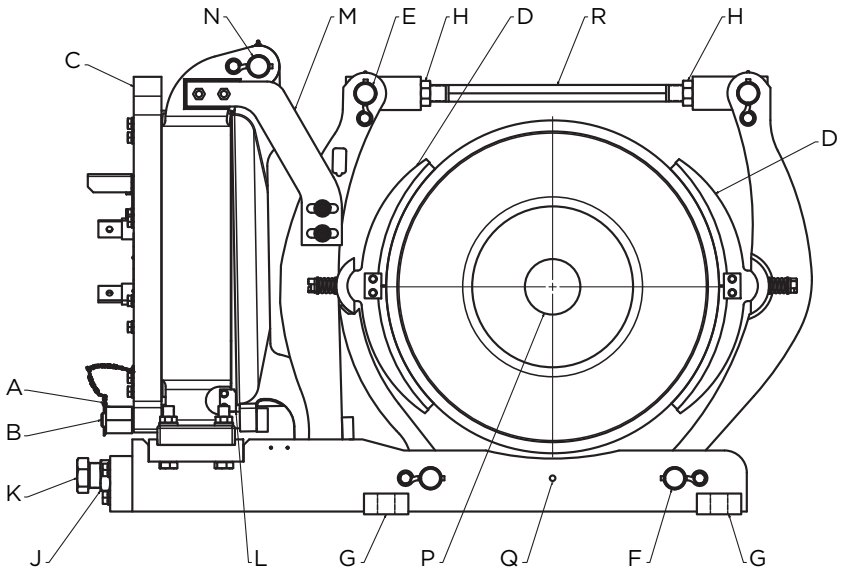


Figure 1: Brake Installation

⚠ CAUTION ⚠

LIFTING HAZARD

Use lifting ear (C) or lifting point on Armature per Fig 1A below. Do not lift the brake by the overlever / connecting rod assembly.

Failure to follow this instruction can result in serious injury or permanent equipment damage.

⚠ WARNING ⚠

STORED ENERGY HAZARD

- The torque spring is under compression.
- Perform the disassembly and assembly steps in the exact order listed.

Failure to follow these instructions can result in death or serious injury.

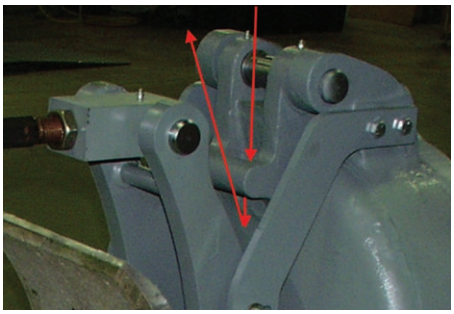
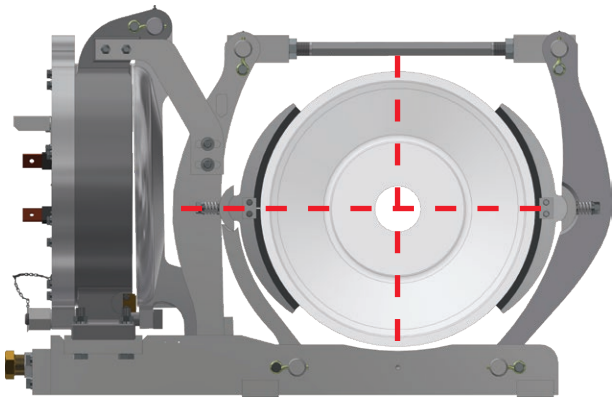


Figure 1A: Preferred Rigging Position

To locate parts during installation:

- See Figure 1 for parts identified by a letter, e.g., “(G)”
- See **PARTS LIST** page 9 for any parts referenced by number, e.g., (50) and not referenced by letters.

1. Unpack the brake carefully.
2. Check nameplate data for correct equipment. Verify that the brake coil is correct. Refer to Tables 2–4.
3. Verify that all parts are undamaged and secure.
4. Check that the brake wheel size and dimensions are correct. (If the brake wheel is supplied by Hubbell / EC&M, the part number is stamped on the face of the hub).
5. Check that the brake has been manually released by removing the Cotter Pin (A) from the Manual Release Nut (B) and tightening the manual release nut (B) until the armature is **completely closed. SEE WARNING!**
6. Lifting to be from Lifting Ear (C) or lifting point on Armature per Fig 1A below. Figure 1A indicates a more balanced rigging strap position using a feature on the brake armature. **Any other rigging strap positions will damage the brake.**
7. Mount the brake wheel (P) on the motor shaft and slide the brake into position using lifting ear (C) on the magnet case or lifting point on Armature per Figure 1A. Center the brake wheel (P) between the shoes (D).
8. 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.



The brake automatically adjusts for ±1/8” misalignment with respect to the vertical line. The brake must be accurately positioned with respect to the horizontal line.

Figure 2: Brake Alignment

See Figure 2: 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.

9. If machinery interference prevents the brake from sliding over the end of the wheel, the brake can be partially disassembled and moved into position laterally as follows:
   a. Remove connecting rod pin (E) and shoe lever pin (F) with Locking Pins and hardware, to remove shoe lever, shoe, and connecting rod assembly from brake.
   b. After moving the brake into position, reassemble and insert pins. Replace all Locking Pins (43), Lock Washers (44) and tighten Screws (45).
10. Using customer-supplied hardware, securely fasten the base of the brake using the four mounting holes (G). Additional support is not normally required under the magnet case.
11. Loosen and return manual release nut (B) to its original brake set position and secure with cotter pin (A) through the hole in Manual Release Screw (54) and aligned within the slot in the manual release nut (B).
12. Check wiring diagram before connecting the brake coil leads (refer to the wiring diagram supplied with the brake or brake rectifier).

⚠ CAUTION ⚠

INSTALLATION HAZARD

Shunt-wound brakes require a shunt brake resistor. The correct shunt brake resistor must be connected in series with the appropriate shunt brake coil.

Overheated coil can result in injury or equipment damage.

Relieving Torque Spring Compression

⚠ DANGER ⚠

DROP OR MOTION HAZARD

Remove the complete hoist load or restrain the bridge/trolley from moving before releasing the brake.

Failure to follow this instruction will result in death or serious injury.

⚠ WARNING ⚠

STORED ENERGY HAZARD

- The torque spring is under compression.
- Perform the disassembly and assembly steps in the exact order listed.

Failure to follow these instructions can result in death or serious injury.

To relieve the compression in torque Operating Spring (72), loosen torque adjusting nut (K) until the torque spring is no longer under compression.

This section describes the adjustment of the brake torque, armature gap, and shoe clearance. Letters in parentheses refer to Figure 1 on page 3

⚠ DANGER ⚠

HAZARDOUS VOLTAGE

Disconnect all power before servicing this equipment.

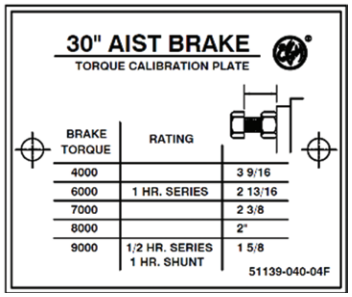
Failure to follow this instruction will result in death or serious injury.

⚠ DANGER ⚠

UNINTENDED EQUIPMENT OPERATION

After performing any adjustment, maintenance, or troubleshooting procedure, visually verify that the manual release nut (B) is returned to the original brake set position and is secured with the cotter pin (A) aligned in the slot in manual release nut (B) and is through the hole in Manual Release Screw (54).

Unexpected brake release can result in death, serious injury, or equipment damage.



Brake Torque Adjustment

The brake torque is adjusted by the Torque Adjusting Screw (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, and reproduced at left.
3. Tighten lock nut (J).

Armature Gap Adjustment

The armature gap indicator (L) indicates the minimum and maximum allowable armature gap setting. It is mounted on the frame near the bottom of the magnet case (see Figure 3).

To adjust the armature gap:

1. Loosen both lock nuts (H), one at each end of connecting rod (R).
2. Turn the connecting rod (R) until the armature is in line with the “minimum gap” notch on the gap indicator plate.
3. Retighten the two locknuts (H).

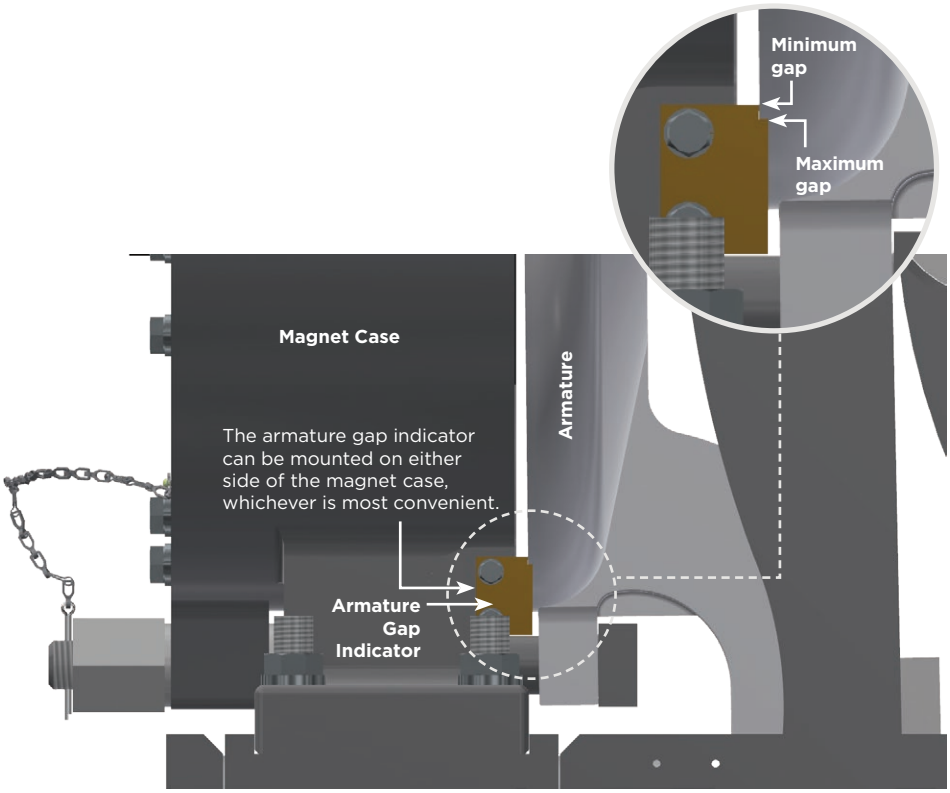


Figure 3: Armature Gap Indicator; armature gap shown set to minimum

Shoe Clearance

Adjusting the armature gap also adjusts the shoe clearance. With the armature gap at the minimum setting, shoe clearance between the wheel and the brake shoe lining is 1/32 in. Brake shoes automatically self-align for a uniform gap between the shoe and the wheel. Operate the brake and check for proper shoe clearance. There may be a slight reduction of gap at the top of each shoe, and a slight increase in gap at the bottom of each shoe.

Maintenance

This section describes items on the brake that may require periodic maintenance. Inspect these items regularly.

Periodic Inspection

The U.S.A. OSHA code requires the inspection of brakes at 1-month to 12-month intervals, depending on activity, severity of service, and environment of the brakes. The code specifically lists the following items for inspection: deformed, cracked, or corroded members; loose bolts; worn, cracked, or distorted parts. (OSHA code of Federal Regulations Part 1910.179 J2 and J3.)

Depending upon the application and environment, wearing parts may require more frequent inspection. It is your responsibility to determine appropriate inspection intervals.

Lubrication

The brake is supplied with oil- impregnated bearings that do not normally require lubrication in most environments. Grease fittings are provided as standard on 30” brakes.

More frequent lubrication service is recommended for brakes used outdoors or in high temperature environments. Initial lubrication should be frequent, until an appropriate inspection interval is determined per each installation, or minimum once per year.

⚠ DANGER ⚠

HAZARDOUS VOLTAGE

Disconnect all power before servicing the equipment.

DROP OR MOTION HAZARD

Remove the hoist load or restrain the bridge/ trolley from moving before releasing the brake.

Failure to follow these instructions will result in death or serious injury.

Brake Shoe and Lining Replacement

As linings wear, the armature gap increases. With the brake set, the armature gap is correct when the inside of the armature aligns with the inside edge of the slotted step of the armature gap indicator (L). The maximum allowable gap is indicated by the outside edge of the slotted step of the armature gap indicator (Figure 3). The armature gap must be readjusted before the armature gap reaches the maximum allowable limit. See Armature Gap Adjustment Section, page 5, above.

A Lining Wear Indicator (50) on the shoe assembly acts as a gauge to indicate shoe lining wear. Replace the lining when its wear surface is even with the top edge of the hex nut (M). Brake shoe replacement does not affect the torque setting. Full torque as adjusted should be restored after the brake is operated enough to reduce high points in the linings, about 6-8 brake operations.

Replace the brake linings using the following procedures (refer to Figure 1):

1. Disconnect power to the brake.
2. Manually release the brake by removing the cotter pin (A) from the manual release nut (B) and tightening the manual release nut (B) until the armature is completely closed.
3. For each shoe, remove items (31) through (34), the two Cap Screws, Shoe Springs, Lock Washers and Flat Washers.
4. Slide the shoes (D) out from either side of the brake.

*NOTE: Brakes produced prior to about 2024, linings are attached by screws. For brake produced on or after 2024, linings are bonded to the brake shoes. Bonded shoes can be used to replace riveted linings. Replacement lining kits are available (refer to **PARTS LIST** page 9).*

5. Replace the shoes, and items (31) through (34). Per each Shoe Assembly, tighten the two Special Cap Screws (31) until the Shoe Springs (33) are fully compressed. THEN:

   Loosen the screws two full turns to obtain proper shoe clearances. Shoes will self-center after operation, if the screws are loosened as required.
6. Readjust the armature air gap as explained in the Shoe Clearance Section on page 6.
7. Loosen and return manual release nut (B) to its original brake set position and secure with cotter pin (A) through the hole in Manual Release Screw (54) and aligned within the slot in the manual release nut (B).

Coil Replacement

The coil and coil core are encapsulated. The operating coil is removed from the rear of the magnet case. When the coil is removed, the brake settings do not change and the brake does not need to be released. Normally, it is not necessary to remove the brake to change the coil.

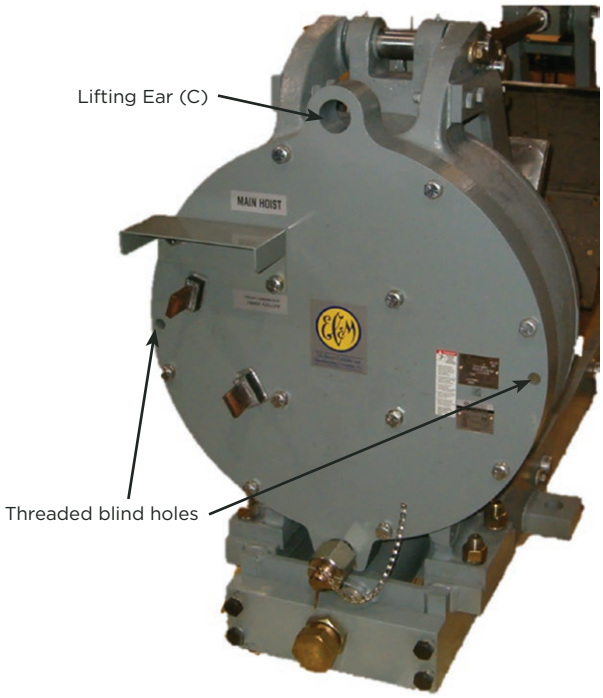


Figure 4: Rear of Magnet Case

⚠ DANGER ⚠

HAZARDOUS VOLTAGE

Disconnect power to the brake before working on the brake coil.

Failure to follow this instruction will result in death, serious injury, or equipment damage.

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

1. Disconnect power to the brake.
2. Disconnect the coil leads.
3. Remove the eight hex-head cap screws (2) from the outer edge of the magnet case cover.
4. Screw two hex-head cap screws (2) into the threaded blind holes in the magnet case cover. This will break loose the magnet case cover and coil core assembly from the magnet case. See Figure 4.
5. A lifting ear (C), located on the magnet case cover, aids in removing the coil assembly. Slide the coil and core assembly out of the magnet case.

⚠ CAUTION ⚠

LIFTING HAZARD

Use lifting hole. Coil for this brake weighs approx. 560lbs / 254kg

Failure to follow this instruction can result in serious injury or equipment damage.

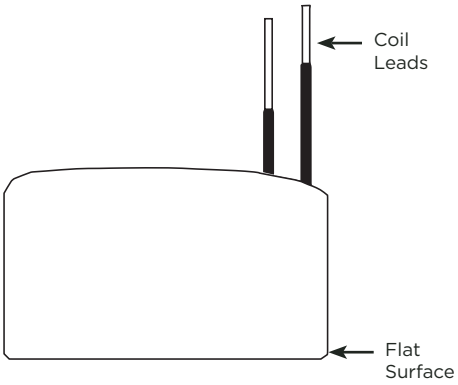


Figure 5: Coil and Core Assembly

6. Lay down the magnet case cover and coil assembly with the flat surface of the coil downward. See Figure 5.
7. Remove the four hex-head cap screws (2) in the center of the magnet case cover. Remove the terminal shield (4) and the magnet case cover.
8. Remove any residue particles from inside the magnet case, and wipe it clean.
9. Verify that the part number of the new coil is correct. See the brake coil application tables on page 2.
10. Place the new coil and coil core so that the back of the coil is horizontal, with the coil leads extending vertically. See Figure 5.
11. Position the magnet case cover on top of the coil assembly.
12. Replace the terminal shield (4) and secure with four hex-head cap screws (2).
13. Seal the space between the coil lead bushing and the magnet case cover, as well as inside the coil lead bushing around the coil lead or busbar with RTV compound, Dow Corning #RTV 732 or equivalent high temperature silicone compound.
14. Using eight hex-head cap screws (2), replace the magnet case cover and the coil assembly into the magnet case.

⚠ DANGER ⚠

DROP OR MOTION HAZARD

Remove the hoist load or restrain the bridge/trolley from moving before releasing the brake.

Failure to follow this instruction will result in death or serious injury.

Brake Wheel Replacement

Perform the following steps to remove the brake wheel (P) from the motor shaft:

1. Disconnect power to the brake.
2. Manually release the brake by removing the Cotter Pin (A) from the Manual Release Nut (B) and tightening the manual release nut until the armature is completely closed.

If replacing the brake wheel and motor armature as a unit, disassemble the brake according to “Relieving Torque Spring Compression” on page 4, and Brake Installation, sections 8 through 12, pages 3 to 4.

Component Bearing Replacement

Replacement of component bearings (18) is recommended during a complete brake overhaul. Remove hoist load or secure the travel motion and remove power to the brake before removing the brake from the crane.

Perform the following steps to replace the frame bushings:

1. Press out the old bearings.
2. Press in new bearings (use of a pilot device is recommended).
3. After bearing replacement, ensure the associated component pin rotates freely.

Table 7: Parts List for Class 5010 Type F30•• 30” WB Brake, Series A

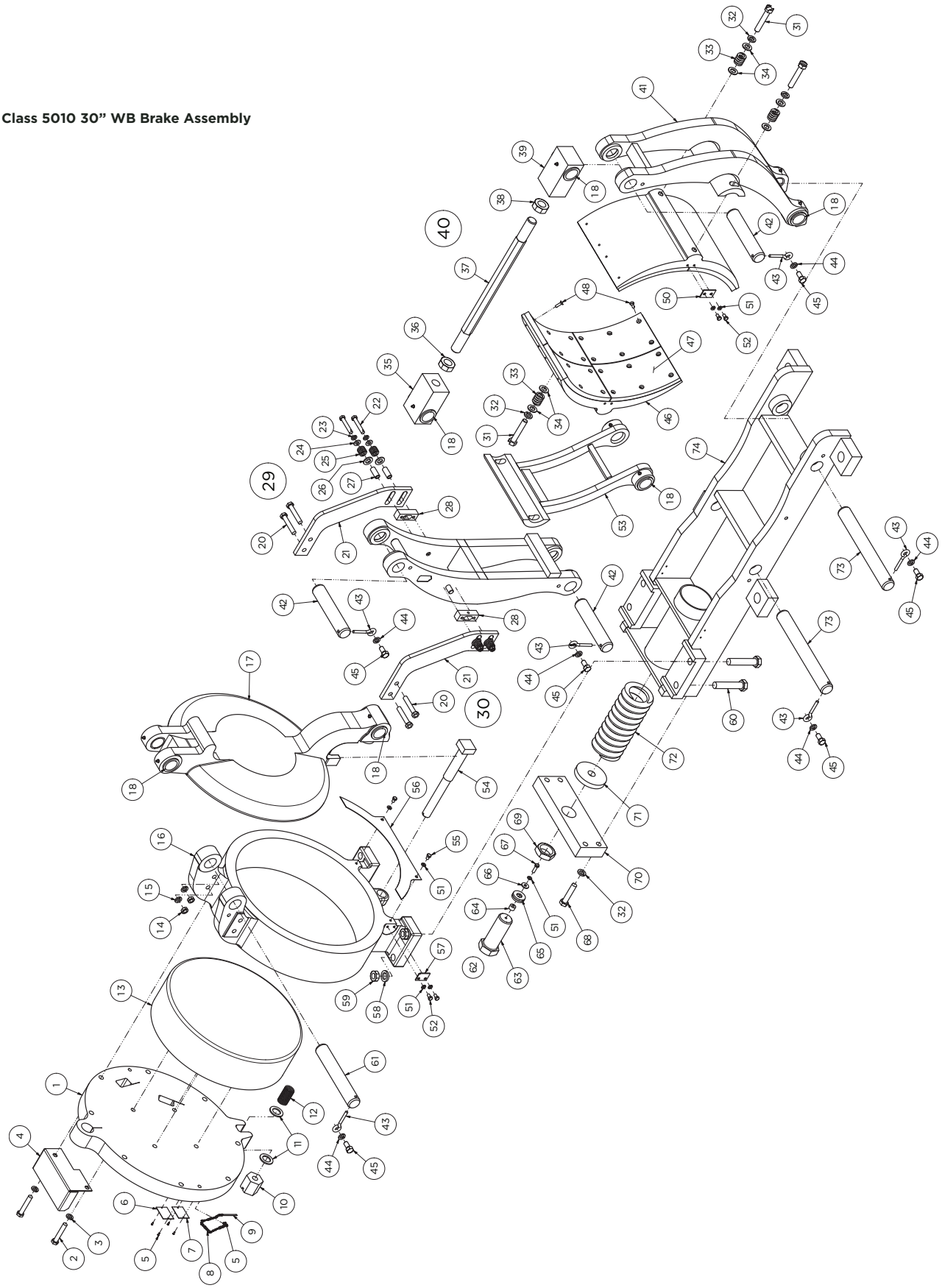
Item	Part Number	Description	QTY
1	50909-013-01	Magnet Case Cover	1
2		5/8-11 X 3-1/2” Lg. Scr.	12
3		5/8 Lock Washer	12
4	50909-020-01	Terminal Shield	1
5		#6 X 3/8” Lg. Drive Screw	5
6	51139-094-01	Nameplate	1
7	51139-040-04	Calibration Plate	1
8		Sash Chain, 1 Ft	1
9		3/16 X 2 1/2” Cotter Pin	1
10	51001-067-06	Manual Release Nut	1
11	50502-003-32	Washer-Manual Release Scr.	2
12	50502-601-12	Spring-Manual Release Scr.	1
13*	50906-01X-5X	Coil Assembly, See Coil or Brake Nameplate	1
14		5/8-11 Jam Nut	4
15		5/8 Lock Washer	4
16	50909-014-01	Magnet Case	1
17	50909-011-51	Armature Assembly	1
18	29005-80830	Bearing	12
19	50909-009-50	Inner Shoe Lever Assy.	1
20		5/8-11 X 3-1/2” Hex Head Scr.	4
21	51007-094-01	Bracket	2
22		1/2-13 X 3” Hex Stc Nylon Cap Scr	4
23		1/2 Split Lock Washer	4
24		1/2 Plain Washer	4
25	50502-601-13	Spring	4
26		3/4 Plain Washer	12
27	50502-052-16	Spacer	4
28	51007-046-01	Bearing	2
29	51007-030-50	Virtual Center Assy. R.H. Includes items 21 to 28	1
30	51007-030-51	Virtual Center Assy. L.H. Includes items 21 to 28	1
31	50502-526-17	3/4-16 X 4 1/4” Lg. Spl. Scr.	4
32		3/4 Lock Washer	8
33	50502-601-38	Shoe Spring	4
34		3/4 Plain Washer	8
35	50909-006-50	Connecting Rod Link - R.H., includes bearings	1
36	23003-00500	1-1/2”-6 Jam Nut, R.H. Thread	1
37	50909-005-01	Connecting Rod	1
38	50903-427-01	1-1/2”-6 Jam Nut, L.H. Thread	1
39	50909-006-51	Connecting Rod Link - L.H. Thread, includes bearings	1
40	50909-005-50	Connecting Rod Assy, includes. it. 35 - 39	1
41	50909-008-50	Outer Shoe Lever Assy., includes bearings	1
42	50903-401-20	Pin, Con. Rod & Inner Lever	3
43	50903-402-04	Locking Pin	6
44		5/8 Lock Washer	6
45		5/8-11 X 1-1/4” Lg. Scr.	6
46	50909-004-50	Brake Shoe Assy w/o Linings	2
47	50909-002-02	Brake Block, Bondable	8
48		5/16-18 X 1” Brass Nylok Fl. Hd Scr.	48
49*	50909-003-51	Brake Shoe Assy. with Bonded Linings, incl It. 46 & 47	2
50	50909-001-01	Lining Wear Indicator	2
51		3/8 Split Lock Washer	9
52		3/8-16 X 5/8” Hex. Hd. Scr.	6
53	50909-010-50	Shoe Support Lever Assy., incl. bearings	1
54	51007-021-01	Manual Release Screw	1
55		3/8-16 X 1/2” Lg. Hex. Hd. Scr.	2
56	51007-035-01	Non-Magnetic Spacer	1
57	50909-015-01	Armature Gap Indicator	1
58		1” Lock Washer	4
59		1-8 Jam Nut	4
60		1-8 X 5” Lg. Hex. Hd. Scr.	4
61	50903-401-13	Pin, Armature	1
62	51007-027-51	Torque Screw Assy. Incl. It. 51, 63-67	1
63	51007-027-02	Torque Screw	1
64	50502-051-28	Spacer	1
65	23690-01580	Thrust Washer (2pc Set)	1
66	50502-003-30	Washer	1
67		3/8-16 X 1-1/4” Hex Head Screw	1
68		3/4-10 X 3 1/2” Lg. Hex. Hd. Scr.	4
69	50502-551-03	Lock Nut, 2 1/4 - 8	1
70	51007-027-01	Torque Screw Plate	1
71	50502-003-31	Spring Thrust Plate	1
72	51007-040-01	Operating Spring	1
73	50903-401-21	Pin, Outer Lever & Support Lever	2
74	50909-007-50	Frame Assembly	1

Standard hardware, listed without a Hubbell part number, can be obtained from a local hardware supplier.

** Parts recommended for general maintenance*

NOTE: Refer to Figure 6 for the assembly drawing.

Figure 6: Class 5010 30” WB Brake Assembly



⚠ DANGER ⚠

HAZARDOUS VOLTAGE

- Disconnect all power before servicing this equipment.
- If power must be turned on to perform some adjustment and maintenance procedures, do not touch live parts. Use electrically insulated tools.

Failure to follow these instructions will result in death, serious injury, or equipment damage.

Refer to Tables 2–4 for coil rating and shunt brake resistor data. Refer to the brake torque rating table on page 3 for brake application data.

Table 13: Troubleshooting

Problem	Possible Causes	Remedy
Brake does not release.	1) Improper or inoperative coil 2) Brake out of adjustment 3) Mechanical interference 4) Improper application	1) Check the coil part number and resistance to determine if the coil is inoperative. 2) Check the armature gap setting. Ensure that the armature gap is not obstructed with dirt or dust. 3) Check for mechanical binding of the armature and shoe lever assemblies. 4) Check the motor rating, resistor assembly or rectifier assembly to verify coil selection.
Brake releases, then sets.	1) Improper or inoperative coil 2) Improper application	1) Check the coil part number and resistance to determine if the coil is inoperative. 2) Check the motor rating, shunt resistor or rectifier assembly to verify coil selection.
Operation is sluggish.	1) Improper or inoperative coil 2) Brake out of adjustment 3) Mechanical interference	1) Check the resistance and compare against the coil part number and resistance to determine if the coil is inoperative. 2) Check the armature gap setting. Ensure that the armature gap is not clogged with dirt. 3) Check for mechanical binding of the armature and shoe lever assemblies.
Brake wheel overheats or cracks.	1) Brake out of adjustment 2) High duty cycle 3) Mechanical interference	1) Check the armature gap setting. Ensure that the armature gap is not clogged with dirt or dust. 2) Check the motor torque rating to verify proper brake selection. 3) Check for mechanical binding of the armature or shoe lever assemblies.
Operating coil overheats.	1) Improper coil 2) Inoperative coil 3) High duty cycle 4) Incorrect or omitted shunt brake resistor	1) Check the coil part number and the motor rating to verify proper coil selection. 2) Check the resistance and compare against the coil part number and resistance to determine if the coil is inoperative. 3) Check the motor torque rating to verify proper brake selection. Check the duty rating of the brake coil. 4) Verify the shunt brake coil is connected in series with the shunt brake resistor. Verify the shunt brake resistor part number against the application.
Lining wears excessively	1) Brake out of adjustment 2) High duty cycle 3) Mechanical interference	1) Check the armature gap setting. Ensure that the armature gap is not clogged with dirt or dust. 2) Check the motor torque rating to verify proper brake selection. 3) Check for mechanical binding of the armature or shoe lever assemblies.

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