

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

# Dayton® Magnetic Disc Brake

## Description

Dayton magnetic disc brake is designed for continuous duty operation on gearmotors. This brake is not rated for more than three stops per minute. Mounting bolts and nuts are included with brake. Brake engages and holds load under power-off condition and automatically releases when power is applied.

**CAUTION** *These brakes are not intended for accurate positioning applications. They are designed for applications that require rapid stopping and holding power such as conveyors, door openers, etc.*

## Specifications

Nominal Static Torque . . . . . 3/4 ft.-lb  
(2 rotating discs)

Rating . . . . . 3/8 ft.-lb  
(1 rotating disc)

### Inertia of Brake

Rotating Parts (Wk<sup>2</sup>) . . . . . 0.001 lb-ft<sup>2</sup>

Enclosure . . . . . Standard Dripproof

Input Speed . . . . . 3600 RPM (Max)

Duty Cycle . . . . . Continuous

Service Factor . . . . . 1.0

Maximum Ambient . . . . . 40°C

Electrical\* { Voltage . . . . . 115V  
Hertz . . . . . 60  
Holding Amps . . . . . 0.16  
Inrush Amps . . . . . 0.36

(\*) Rated for operation on 115V, 60 Hz single phase power supply only.

## Unpacking

When unpacking unit, inspect carefully for any damage that may have occurred during transit.

## General Safety Information

**CAUTION** *These brakes are not intended for accurate position applications. They are designed for applications that require rapid stopping and holding power such as conveyors, door openers, etc.*

1. For hoist applications use a brake with a minimum service factor of 2 or higher, depending on application.
2. For applications containing high inertia-type loads or rapid cycling, service

factor of brake must be increased depending upon application.

3. Observe all local electrical and safety codes, as well as the United States National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
4. Brake motors and brake gearmotors must be securely and adequately grounded. This can be accomplished by wiring with a grounded metal-clad raceway system; by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means. Refer to NEC article 250 (grounding) for additional information. All wiring should be done by a qualified electrician.

**WARNING** *Always disconnect power before working on or near a brake motor, a brake gearmotor or its connected load. If the power disconnect point is out of sight, lock it in the open position and tag to prevent unexpected application of power.*

5. When working on brake, be sure load is completely removed, secured or blocked so as not to cause injury to surrounding personnel or damage to property.
6. Guard all moving parts.
7. Be careful when touching the exterior of an operating motor, gearmotor or brake. It may be hot enough to



Figure 1

cause injury or pain. This condition is normal with modern motors which are designed to operate at higher temperatures when running at rated load and voltage.

8. Protect all electrical lead wires and power cables from coming in contact with sharp objects or moving parts.
9. Do not kink electrical lead wires and power cables, and never allow them to come in contact with oil, grease, hot surfaces or chemicals.

**WARNING** *Do not install in an explosive atmosphere.*

## Installation

Before installing, refer to section on Torque Selection, use Figures 2 thru 5 as reference.

This brake is designed so it can be mounted in all positions.

1. Remove plastic cap cover over the motor shaft extension. (Snap-off and discard, and remove screw holding cap.)
2. Position hub (Ref. No. 8) on motor shaft 1/32" from mounting surface of motor fan guard and securely tighten both set screws. Bore in hub (See Figure 2) is designed to give minimum clearance between hub and motor shaft. If hub is tight on shaft, use emery cloth on motor shaft so that hub slides on freely. Loctite or similar adhesive may be used on motor shaft extension.

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## Installation (Continued)

- Remove cover pan head screws (Ref. No. 17) and cover (Ref. No. 16).
- Place brake on motor, guiding rotating discs (Ref. No. 9) on hub. Mount brake so that grommet (Ref. No. 7) is on the wire connection box side of motor. Depress operator assembly lever (Ref. No. 18) and align discs if needed. Attach brake securely to motor mounting surface using fillister screws (Ref. No. 5), lockwasher (Ref. No. 4) and spacers (Ref. No. 2). Use of needlenose pliers to guide and hold spacer may be helpful. Brake bracket (Ref. No. 3) to be concentric with motor shaft within 0.010 T.I.R. and square within 0.010.
- Brake is connected in parallel with motor line leads, therefore brake is energized when power is applied to motor (115V, 60 Hz).
- Energize brake and motor briefly to insure proper action.
- Bring solenoid lead wires thru grommet (Ref. No. 7) to make the electrical connection. Replace cover and cover screws.

## Operation

The units are spring set devices with an electrical (solenoid) release containing one or two rotating discs; driven by a hub which is mounted on the motor shaft. When energized, the solenoid release mechanism compresses a spring removing the force on the pressure plate, and permits free rotation of the shaft.

**CAUTION** *High start-stop rates may damage motor and/or brake. Consult motor manufacturer whenever high cycling rates are involved.*

The following precautions should be followed concerning operation of unit:

- Do not operate unit above nominal static torque capacity.
- For hoist applications use a brake with a minimum service factor of 2 or higher, depending on application.
- For applications containing high inertia type loads or rapid cycling, service factor of brake must be increased depending on application.
- Exercise proper safety procedures when an application involves a holding or overhauling load operation. Keep personnel away from load area.
- Be sure power supply conforms to electrical rating of brake.

## Maintenance

### FRICION DISC REPLACEMENT

**CAUTION** *Load to be removed or blocked. Brake will be inoperative during this procedure.*

Use Figures 3 and 4 for reference. When total wear on rotating discs (Ref. No. 9) reaches 0.04", replace discs as follows:

- Disconnect solenoid (Ref. No. 24) from circuit and remove cover (Ref. No. 16).
- Remove locknuts (Ref. No. 15); washers (Ref. No. 14); operator assembly (Ref. No. 13); pressure plate (Ref. No. 12); stationary disc (Ref. No. 11); rotating disc (Ref. No. 9); stationary disc (Ref. No. 10); and rotating disc (Ref. No. 9).
- Replace worn discs and assemble in reverse order. Discs must slide freely on hub (Ref. No. 8).

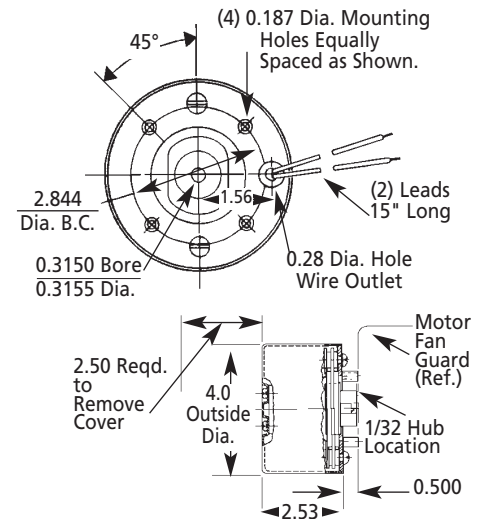


Figure 2 – Dimensions

**NOTE:** Stationary disc (Ref. No. 10) is 0.060 in. thick, and must be in the location shown in Figure 4. Stationary disc (Ref. No. 11) is 0.030 in. thick, and must be located as shown.

- Before installing operator assembly (Ref. No. 13) turn set screw (Ref. No. 22) counterclockwise 4 or 5 turns to allow operator to be bolted down without interference.
- Readjust air gap "A" (See Wear Adjustment).

### SOLENOID REPLACEMENT

**CAUTION** *Load to be removed or blocked. Brake will be inoperative during this procedure.*

Use Figure 3 for reference.

- Disconnect solenoid (Ref. No. 24) from circuit, and remove cover (Ref. No. 16).
- Remove solenoid assembly (Ref. No. 24) and torque spring (Ref. No. 20) by removing fillister head screws (Ref. No. 27) and split lockwashers (Ref. No. 26).

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## Maintenance (Continued)

3. Insert new solenoid assembly by sliding plunger (Ref. No. 19) into slot of operator assembly lever (Ref. No. 18), keeping torque spring around plunger.
4. Fasten solenoid assembly to mounting bracket (Ref. No. 25) with fillister head screws (Ref. No. 27) and split lockwashers (Ref. No. 26).
5. Adjust air gap "A" (See Wear Adjustment).

## TORQUE SELECTION

The brake is designed so that the torque can be changed from 3/4 ft.-lb. to 3/8 ft.-lb.

Before installing, select the proper torque for your gearmotor, in the following manner:

Torque Rating	Input Speed	Max. HP
3/4 ft.-lb.	1750 RPM	1/4 HP
	3450 RPM	1/2 HP
3/8 ft.-lb.	1750 RPM	1/8 HP
	3450 RPM	1/4 HP

The brake as furnished has two rotating discs (Ref. No. 9), and will have a nominal static torque rating of 3/4 ft.-lb. To reduce torque to 3/8 ft.-lb. a rotating disc must be removed and the solenoid air gap has to be readjusted.

Proceed as follows:

Depress solenoid plunger and remove the rotating disc (Ref. No. 9) which is closest to the solenoid. Release plunger. Set air gap "A" at 3/8" by turning set screw (Ref. No. 22) clockwise. Depress solenoid plunger several times and recheck air gap "A".

## WEAR ADJUSTMENT

Use Figure 3 for reference.

As friction discs wear, magnet air gap "A" increases, thereby increasing stopping time of brake. Before air gap "A" reaches 7/16" maximum (measured on center line of plunger) adjustment for wear is required. Any delay in adjusting air gap will result in a loss of torque and/or coil burn out.

To adjust brake proceed as follows:

1. Remove cover (Ref. No. 16).
2. Insert allen wrench into set screw (Ref. No. 22) and turn clockwise until solenoid air gap is approximately 3/8. Gap is measured between operator assembly lever (Ref. No. 18) and solenoid (Ref. No. 24) "C" frame, at center line of plunger (Ref. No. 19).

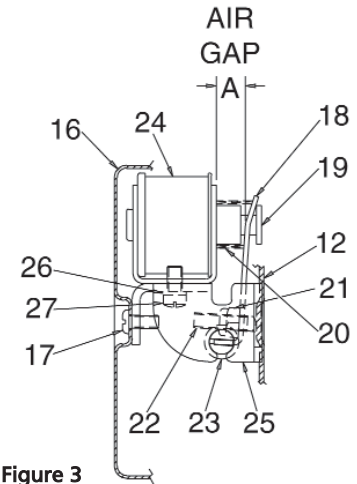


Figure 3

**NOTE:** The 3/8" dimension for the air gap is a nominal position. On low horsepower units, the gap may have to be slightly larger. Observe motor starting characteristics after adjusting gap. Motor should start quickly. If not, increase air gap by turning adjusting set screw (Ref. No. 22) 1/8 turn counter-clockwise.

# For Repair Parts, call 1-800-323-0620

24 hours a day - 365 days a year

Please provide following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

Address parts correspondence to:

Grainger Parts  
 P.O. Box 3074  
 1657 Shermer Road  
 Northbrook, IL 60065-3074 U.S.A.

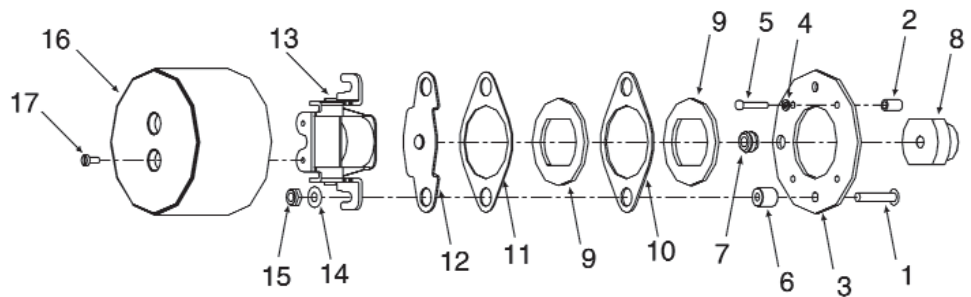


Figure 4 – Repair Parts Illustration

## Replacement Parts for Brake Assembly

Reference Number	Description	Part Number	Quantity
1	Round head screw	W001002-105	2
2	• Spacer	G040032-001	4
3	Bracket	G040029-001	1
4	• Lockwasher	W004006-003	4
5	• Fillister head screw	W001009-026	4
6	Spacer	G040040-001	2
7	Grommet	W027001-002	1
8	Hub w/set screws	G040046-001	1
9	Rotating disc	G040041-001	2
10	Stationary disc (inner)	G040044-001	1
11	Stationary disc (outer)	G040042-001	1
12	Pressure plate	H040024-001	1
13	† Operator assembly (115V, 60 Hz)	K040049-001	1
14	Washer	W004003-022	2
15	Locknut	W003001-013	2
16	Cover	H040025-001	1
17	Screw, Slotted Hex Washer Head	W001046-042	2

(•) Included in hardware package (H060237-029)

(†) Optional operator assemblies:  
 230V, 60 Hz — order Part No. K040049-002  
 230V, 50 Hz — order Part No. K040049-004

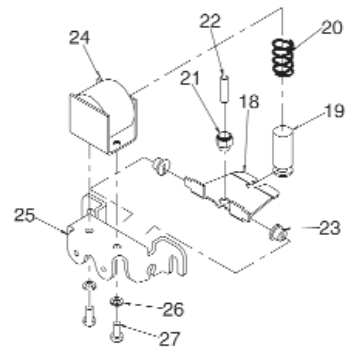


Figure 5 – Operator Assembly Components

Reference only — order operator assembly (Ref. No. 13).

## Replacement Parts for Operator Assembly

(For reference only — See Ref. No. 13)

Reference Number	Description	Part Number	Quantity
18	Lever assembly — includes Clinch nut (Ref. No. 21)		1
19	Solenoid plunger		1
20	Torque spring	For reference only. Must order complete	1
21	#10-32 Clinch nut		1
22	#10-32 x 3/4" Set screw		1
23	Nylon bushing		2
24	Solenoid — includes plunger Ref. No. 19. (115V-60 Hz)	Operator Assembly (Ref. No. 13)	1
25	Mounting bracket		1
26	#10 Lockwasher		2
27	#10-32 x 0.375 fillister head screw		2

# Model 5X400A

## Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Brake does not release	<ol style="list-style-type: none"> <li>1. Broken or damaged parts</li> <li>2. Wrong voltage</li> <li>3. Burned out coil</li> <li>4. Incorrect wiring connections or broken wires</li> <li>5. Plunger binding due to worn parts</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace</li> <li>2. Check voltage, voltage must not vary more than <math>\pm 10\%</math> rated voltage</li> <li>3. Replace solenoid assembly (Ref. No. 24)</li> <li>4. Check for bad electrical or incorrect connections or broken wires</li> <li>5. De-burr plunger (Ref. No. 19) or replace solenoid (Ref. No. 24)</li> </ol>
Brake does not stop properly	<ol style="list-style-type: none"> <li>1. Broken or damaged parts</li> <li>2. Worn friction discs</li> <li>3. Hub positioned incorrectly</li> <li>4. Incorrect alignment between brake and motor shaft</li> <li>5. Air gap excessive</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace</li> <li>2. Replace if worn. Refer to section on Friction Disc Replacement</li> <li>3. Refer to section on Installation</li> <li>4. Correct alignment. Refer to section on Installation Procedures</li> <li>5. Refer to section on Wear Adjustment</li> </ol>
Brake chatters or hums	<ol style="list-style-type: none"> <li>1. Wrong voltage supply for coil</li> <li>2. Solenoid air gap excessive</li> <li>3. Loose or broken shading pole. Part of solenoid assembly</li> <li>4. Wrong size lead wires</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace coil with correct voltage rating</li> <li>2. Adjust air gap. Refer to section on Wear Adjustment</li> <li>3. Clean or replace solenoid assembly (Ref. No. 24)</li> <li>4. Disconnect or rewire source voltage to brake</li> </ol>

### LIMITED WARRANTY

**DAYTON ONE-YEAR LIMITED WARRANTY.** Dayton® Magnetic Disc Brake, Models covered in this manual, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.

**LIMITATION OF LIABILITY.** To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.

**WARRANTY DISCLAIMER.** Dayton has made a diligent effort to provide product information and illustrate the products in this literature accurately; however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABILITY, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

**PRODUCT SUITABILITY.** Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

**PROMPT DISPOSITION.** Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714 U.S.A.