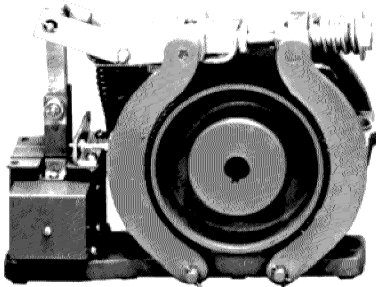


**Contents**

|                                       |             |
|---------------------------------------|-------------|
| <i>Description</i>                    | <i>Page</i> |
| <b>AC and DC Magnetic Shoe Brakes</b> |             |
| Product Description . . . . .         | 33-218      |
| Application Description . . . . .     | 33-218      |
| Features . . . . .                    | 33-218      |
| Brake Selection . . . . .             | 33-218      |
| Shipping Weights . . . . .            | 33-219      |
| Dimensions . . . . .                  | 33-219      |
| Product Selection . . . . .           | 33-220      |

**33**



*Size S-7 Brake and Wheel*

**Product Description**

Cutler-Hammer® Type S Brakes from Eaton’s electrical business are electrically released and spring applied providing “fail-safe” operation. The retarding torque developed is directly proportional to the spring pressure.

**Application Description**

- Conveyors
- Machine tools
- Printing presses
- Small cranes
- Overhead doors
- Dumb waiters
- Vacuum molding machines
- Carnival rides

**Features**

The brake wheel is of relatively large size in relation to the torque developed by the brake. This permits use of a larger brake shoe lining and lower shoe pressures. Low shoe pressure, equally distributed over a large lining area, results in even wear of the friction surfaces and even braking torque. The oversize wheel type construction also permits use of a smaller operating solenoid that requires less current for a given torque rating.

**Brake Selection**

The method most generally used to determine required braking torque is to calculate the full load motor torque by the following formula:

$$T = \frac{5252 \times \text{hp}}{\text{rpm}}$$

T = Full load motor torque in lb-ft  
 hp = Motor horsepower  
 rpm = Speed of shaft on which brake wheel is mounted

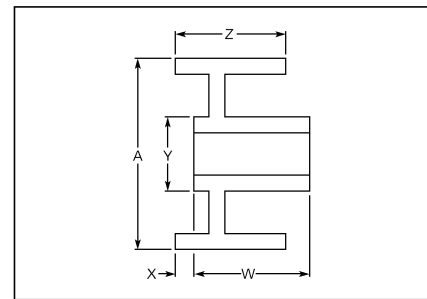
The torque rating of the brake selected should be at least equal to the full load motor torque for the duty considered.

**DC Brakes**

Standard DC brakes are equipped with shunt coils. The magnet coil circuit on DC brakes consists of two separate windings and a protective switch.

**Mounting**

Type S brakes are designed and recommended for use and mounting only in the horizontal position. Side or vertical mountings are not recommended because the solenoid loading is altered, resulting in accelerated wear and premature coil failure.



**Figure 33-78. Standard Brake Wheels — Approximate Dimensions**

**Table 33-305. Standard Brake Wheel Dimensions**

| Approximate Dimensions in Inches (mm) |              |             |             |              | Bore        |             |
|---------------------------------------|--------------|-------------|-------------|--------------|-------------|-------------|
| A                                     | Z            | W ①         | X           | Y            | Max.        | Min.        |
| 4.00 (101.6)                          | 2.75 (69.9)  | 1.63 (41.4) | 1.38 (35.1) | 2.50 (63.5)  | 1.38 (35.1) | .50 (12.7)  |
| 5.50 (139.7)                          | 3.25 (82.6)  | 2.00 (50.8) | 1.63 (41.4) | 3.25 (82.6)  | 2.00 (50.8) | .75 (19.1)  |
| 7.00 (177.8)                          | 4.25 (108.0) | 3.00 (76.2) | 1.25 (31.8) | 4.00 (101.6) | 2.25 (57.2) | 1.00 (25.4) |
| 10.00 (254.0)                         | 4.25 (108.0) | 3.25 (82.6) | 1.25 (31.8) | 4.88 (124.0) | 2.88 (73.2) | 1.38 (35.1) |

① Hub lengths other than standard are not available.

**Shipping Weights**

**Table 33-306. Approximate Shipping Weights**

| Brake Size | Torque Rating ft-lb | Weight in Lbs. (kg)    |                  |                          |
|------------|---------------------|------------------------|------------------|--------------------------|
|            |                     | Net — Brake with Wheel | Net — Wheel Only | Boxed — Brake with Wheel |

**Type “S” AC Shoe Brakes**

|         |          |              |             |               |
|---------|----------|--------------|-------------|---------------|
| S-4     | 3        | 15.8 (7.2)   | 3.4 (1.5)   | 17.0 (7.7)    |
| S-4     | 10       | 15.8 (7.2)   | 3.4 (1.5)   | 17.0 (7.7)    |
| S-4     | 15       | 15.8 (7.2)   | 3.4 (1.5)   | 17.0 (7.7)    |
| S-5-1/2 | 25       | 33.2 (15.1)  | 7.5 (3.4)   | 36.0 (16.3)   |
| S-5-1/2 | 35       | 33.2 (15.1)  | 7.5 (3.4)   | 36.0 (16.3)   |
| S-7     | 50       | 52.1 (23.7)  | 18.8 (8.5)  | 55.0 (25.0)   |
| S-7     | 75       | 52.1 (23.7)  | 18.8 (8.5)  | 55.0 (25.0)   |
| S-10    | 125, 160 | 200.0 (90.8) | 38.5 (17.3) | 225.0 (102.2) |

**Type “S” DC Shoe Brakes**

|         |     |             |            |             |
|---------|-----|-------------|------------|-------------|
| S-4     | 3   | 18.0 (8.2)  | 3.4 (1.5)  | 20.0 (9.1)  |
| S-4     | 10  | 18.0 (8.2)  | 3.4 (1.5)  | 20.0 (9.1)  |
| S-4     | 15  | 18.0 (8.2)  | 3.4 (1.5)  | 20.0 (9.1)  |
| S-5-1/2 | 25  | 35.0 (15.9) | 7.5 (3.4)  | 38.0 (17.3) |
| S-5-1/2 | 35  | 35.0 (15.9) | 7.5 (3.4)  | 38.0 (17.3) |
| S-7     | 50  | 54.0 (24.5) | 18.8 (8.5) | 58.0 (26.3) |
| S-7     | 75  | 54.0 (24.5) | 18.8 (8.5) | 58.0 (26.3) |
| S-7     | 85  | 54.0 (24.5) | 18.8 (8.5) | 58.0 (26.3) |
| S-7     | 110 | 54.0 (24.5) | 18.8 (8.5) | 58.0 (26.3) |

Dimensions

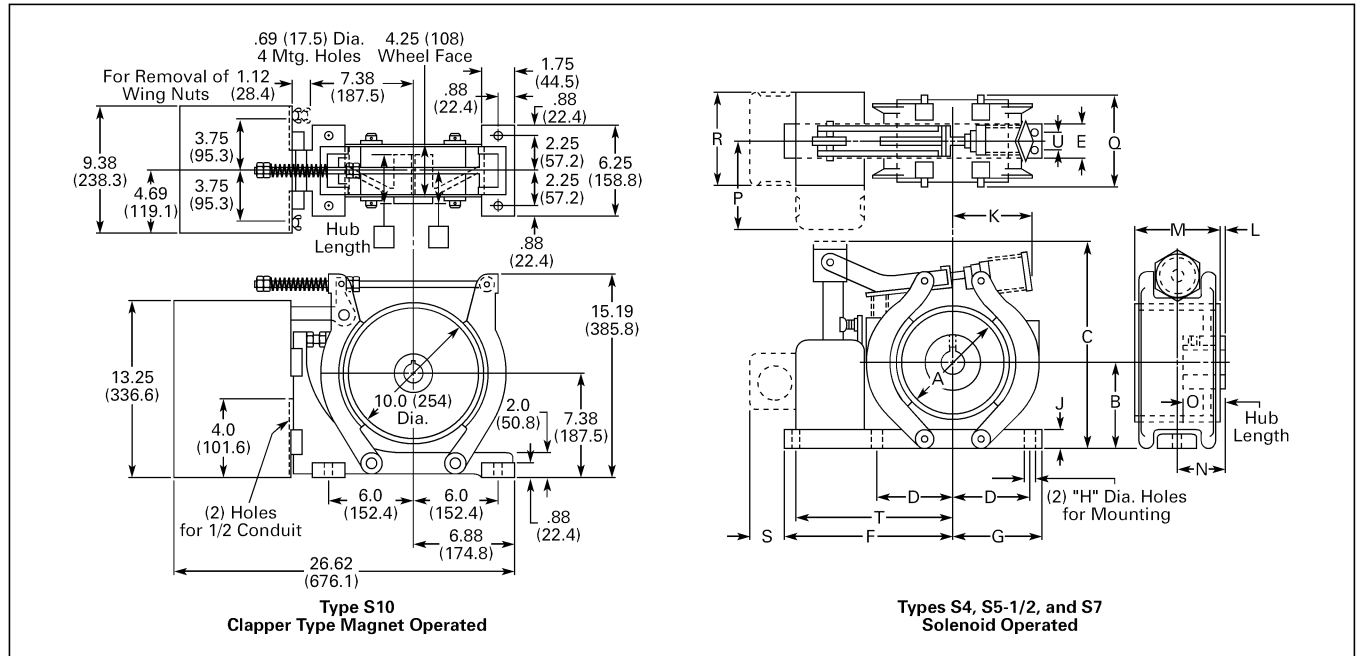


Figure 33-79. Approximate Dimensions in Inches (mm)

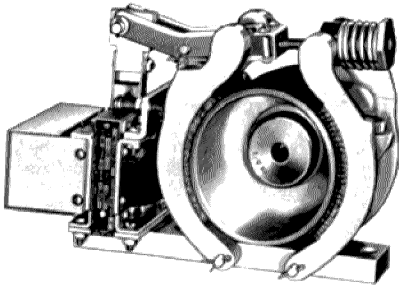
Table 33-307. Approximate Dimensions

| Brake Size              | Torque Rating ft-lb | Dimensions in Inches (mm) |              |               |              |             |              |              |            |             |              |           |              |             |             |             |              |              |
|-------------------------|---------------------|---------------------------|--------------|---------------|--------------|-------------|--------------|--------------|------------|-------------|--------------|-----------|--------------|-------------|-------------|-------------|--------------|--------------|
|                         |                     | A                         | B ①          | C             | D            | E           | F            | G            | H          | J           | K            | L         | M            | N           | O           | P           | Q            | R            |
| Type "S" AC Shoe Brakes |                     |                           |              |               |              |             |              |              |            |             |              |           |              |             |             |             |              |              |
| S-4                     | 3                   | 4.00 (101.6)              | 2.88 (73.2)  | 7.50 (190.5)  | 2.63 (66.8)  | 1.25 (31.8) | 7.50 (190.5) | 3.13 (79.5)  | .38 (9.7)  | .63 (16.0)  | 2.88 (73.2)  | .25 (6.4) | 2.75 (69.9)  | 1.63 (41.4) | 1.63 (41.4) | 2.88 (73.2) | 3.00 (76.2)  | 3.13 (79.5)  |
| S-4                     | 10                  | 4.00 (101.6)              | 2.88 (73.2)  | 7.50 (190.5)  | 2.63 (66.8)  | 1.25 (31.8) | 7.50 (190.5) | 3.13 (79.5)  | .38 (9.7)  | .63 (16.0)  | 2.88 (73.2)  | .25 (6.4) | 2.75 (69.9)  | 1.63 (41.4) | 1.63 (41.4) | 2.88 (73.2) | 3.00 (76.2)  | 3.13 (79.5)  |
| S-4                     | 15                  | 4.00 (101.6)              | 2.88 (73.2)  | 7.50 (190.5)  | 2.63 (66.8)  | 1.25 (31.8) | 7.50 (190.5) | 3.13 (79.5)  | .38 (9.7)  | .63 (16.0)  | 2.88 (73.2)  | .25 (6.4) | 2.75 (69.9)  | 1.63 (41.4) | 1.63 (41.4) | 2.88 (73.2) | 3.00 (76.2)  | 3.13 (79.5)  |
| S-5-1/2                 | 25                  | 5.50 (139.7)              | 4.00 (101.6) | 9.50 (241.3)  | 3.50 (88.9)  | 2.00 (50.8) | 8.38 (212.9) | 4.13 (104.9) | .44 (11.2) | 1.00 (25.4) | 4.88 (124.0) | .38 (9.7) | 3.25 (82.6)  | 2.00 (50.8) | 2.00 (50.8) | 3.13 (79.5) | 3.75 (95.3)  | 3.13 (79.5)  |
| S-5-1/2                 | 35                  | 5.50 (139.7)              | 4.00 (101.6) | 9.50 (241.3)  | 3.50 (88.9)  | 2.00 (50.8) | 8.38 (212.9) | 4.13 (104.9) | .44 (11.2) | 1.00 (25.4) | 7.88 (200.2) | .38 (9.7) | 3.25 (82.6)  | 2.00 (50.8) | 2.00 (50.8) | 3.13 (79.5) | 3.75 (95.3)  | 3.13 (79.5)  |
| S-7                     | 50                  | 7.00 (177.8)              | 5.00 (127.0) | 11.50 (292.1) | 4.38 (111.3) | 2.50 (63.5) | 9.50 (241.3) | 5.00 (127.0) | .56 (14.2) | 1.00 (25.4) | 6.00 (152.4) | —         | 4.25 (108.0) | 2.13 (54.1) | 3.00 (76.2) | 3.13 (79.5) | 4.75 (120.7) | 3.13 (79.5)  |
| S-7                     | 75                  | 7.00 (177.8)              | 5.00 (127.0) | 11.50 (292.1) | 4.38 (111.3) | 2.50 (63.5) | 9.50 (241.3) | 5.00 (127.0) | .56 (14.2) | 1.00 (25.4) | 6.00 (152.4) | —         | 4.25 (108.0) | 2.13 (54.1) | 3.00 (76.2) | 3.13 (79.5) | 4.75 (120.7) | 3.13 (79.5)  |
| S-10                    | 125, 160            | Refer to above drawing.   |              |               |              |             |              |              |            |             |              |           |              |             |             |             |              |              |
| Type "S" DC Shoe Brakes |                     |                           |              |               |              |             |              |              |            |             |              |           |              |             |             |             |              |              |
| S-4                     | 3                   | 4.00 (101.6)              | 3.50 (88.9)  | 8.00 (203.2)  | 2.63 (66.8)  | 1.25 (31.8) | 7.56 (192.0) | 3.25 (82.6)  | .38 (9.7)  | .75 (19.1)  | 2.88 (73.2)  | .25 (6.4) | 2.75 (69.9)  | 1.63 (41.4) | 1.63 (41.4) | 2.63 (66.8) | 3.00 (76.2)  | 4.06 (103.1) |
| S-4                     | 10                  | 4.00 (101.6)              | 3.50 (88.9)  | 8.00 (203.2)  | 2.63 (66.8)  | 1.25 (31.8) | 7.56 (192.0) | 3.25 (82.6)  | .38 (9.7)  | .75 (19.1)  | 2.88 (73.2)  | .25 (6.4) | 2.75 (69.9)  | 1.63 (41.4) | 1.63 (41.4) | 2.63 (66.8) | 3.00 (76.2)  | 4.06 (103.1) |
| S-4                     | 15                  | 4.00 (101.6)              | 3.50 (88.9)  | 8.00 (203.2)  | 2.63 (66.8)  | 1.25 (31.8) | 7.56 (192.0) | 3.25 (82.6)  | .38 (9.7)  | .75 (19.1)  | 2.88 (73.2)  | .25 (6.4) | 2.75 (69.9)  | 1.63 (41.4) | 1.63 (41.4) | 2.63 (66.8) | 3.00 (76.2)  | 4.06 (103.1) |
| S-5-1/2                 | 25                  | 5.50 (139.7)              | 4.00 (101.6) | 9.50 (241.3)  | 3.50 (88.9)  | 2.00 (50.8) | 8.38 (212.9) | 4.13 (104.9) | .44 (11.2) | 1.00 (25.4) | 4.88 (124.0) | .38 (9.7) | 3.25 (82.6)  | 2.00 (50.8) | 2.00 (50.8) | 2.88 (73.2) | 3.75 (95.3)  | 4.06 (103.1) |
| S-5-1/2                 | 35                  | 5.50 (139.7)              | 4.00 (101.6) | 9.50 (241.3)  | 3.50 (88.9)  | 2.00 (50.8) | 8.38 (212.9) | 4.13 (104.9) | .44 (11.2) | 1.00 (25.4) | 7.88 (200.2) | .38 (9.7) | 3.25 (82.6)  | 2.00 (50.8) | 2.00 (50.8) | 2.88 (73.2) | 3.75 (95.3)  | 4.06 (103.1) |
| S-7                     | 50                  | 7.00 (177.8)              | 5.00 (127.0) | 11.50 (292.1) | 4.38 (111.3) | 2.50 (63.5) | 9.50 (241.3) | 5.00 (127.0) | .56 (14.2) | 1.00 (25.4) | 6.00 (152.4) | —         | 4.25 (108.0) | 2.13 (54.1) | 3.00 (76.2) | 2.88 (73.2) | 4.88 (124.0) | 4.06 (103.1) |
| S-7                     | 75                  | 7.00 (177.8)              | 5.00 (127.0) | 11.50 (292.1) | 4.38 (111.3) | 2.50 (63.5) | 9.50 (241.3) | 5.00 (127.0) | .56 (14.2) | 1.00 (25.4) | 6.00 (152.4) | —         | 4.25 (108.0) | 2.13 (54.1) | 3.00 (76.2) | 2.88 (73.2) | 4.88 (124.0) | 4.06 (103.1) |
| S-7                     | 85                  | 7.00 (177.8)              | 5.00 (127.0) | 11.50 (292.1) | 4.38 (111.3) | 2.50 (63.5) | 9.50 (241.3) | 5.00 (127.0) | .56 (14.2) | 1.00 (25.4) | 6.00 (152.4) | —         | 4.25 (108.0) | 2.13 (54.1) | 3.00 (76.2) | 2.88 (73.2) | 4.88 (124.0) | 4.06 (103.1) |
| S-7                     | 110                 | 7.00 (177.8)              | 5.00 (127.0) | 11.50 (292.1) | 4.38 (111.3) | 2.50 (63.5) | 9.50 (241.3) | 5.00 (127.0) | .56 (14.2) | 1.00 (25.4) | 6.00 (152.4) | —         | 4.25 (108.0) | 2.13 (54.1) | 3.00 (76.2) | 2.88 (73.2) | 4.88 (124.0) | 4.06 (103.1) |

① Open type brake only.

**511 Series**

**33**



*Size S-4 Brake and Wheel*

**Product Selection**

**When Ordering Specify**

- Brake
  - Catalog Number plus Suffix Number for coil
  - Example: 511H1193-41
- Wheel
  - Catalog Number plus Suffix Number for bore size
  - Example: 511H1150-3

- Enclosure
  - Catalog Number
  - Example: 511ED50

**Table 33-308. Type S Brakes — Floor Mounting**

| Torque — lb-ft |                | Brake Size | AC                     |               |                              |                        | DC            |              |               |     |
|----------------|----------------|------------|------------------------|---------------|------------------------------|------------------------|---------------|--------------|---------------|-----|
| Continuous     | Intermittent ① |            | Base Catalog Number ②③ | Price U.S. \$ | For Type S4, S5-1/2, S7, S10 | Base Catalog Number ②③ | Price U.S. \$ | Coil Voltage | Coil Suffix ② |     |
|                |                |            |                        |               | Coil Volts and Hertz         |                        |               |              |               |     |
| 3              | 3              | S-4        | 511H1194               | *             | 120V 60 Hz                   | -39                    | 511H955       | *            | 120V DC       | -97 |
| 10             | 10             | S-4        | 511H1193               | *             | 208V 60 Hz                   | -45                    | 511H956       | *            | 240V DC       | -98 |
| —              | 15             | S-4        | 511H1192               | *             | 240V 60 Hz                   | -40                    | 511H957       | *            |               |     |
| 25             | 25             | S-5-1/2    | 511H992                | *             | 480V 60 Hz                   | -41                    | 511H994       | *            |               |     |
| —              | 35             | S-5-1/2    | 511H993                | *             | 600V 60 Hz                   | -58                    | 511H995       | *            |               |     |
| 50             | 50             | S-7        | 511H970                | *             | 110V 50 Hz                   | -5                     | 511H975       | *            |               |     |
| —              | 75             | S-7        | 511H971                | *             | 220V 50 Hz                   | -6                     | 511H976       | *            |               |     |
| 85             | 85             | S-7        | 511H1195               | *             | 380V 50 Hz                   | -7                     | 511H1197      | *            |               |     |
| —              | 110            | S-7        | 511H1196               | *             | 400V 50 Hz                   | -8                     | 511H1197      | *            |               |     |
| 125            | 125            | S-10       | 511H996                | *             | 550V 50 Hz                   | -9                     | 511H1198      | *            |               |     |
| —              | 160            | S-10       | 511H997                | *             |                              |                        | —             |              |               |     |

① Intermittent duty indicates that the coil can be placed across the line continuously for one hour maximum without excessive heating. It is equivalent to 1/2 time ON and 1/2 time OFF.  
 ② Add Suffix Number for coil voltage to Base Catalog Number.  
 ③ Does not include Wheel.

**Table 33-309. Enclosures Only**

| Brake Size | NEMA 2 – 3R ④<br>Dripproof, Rainproof and Sleet Resistant |               |
|------------|---|---------------|
|            | Catalog Number  | Price U.S. \$ |
| S-4        | 511ED50   | 850.          |
| S-5-1/2    | 511ED51   | 910.          |
| S-7        | 511ED52   | 985.          |

④ Can be mounted either right or left hand.  
 \*Please contact your local Eaton sales office.

Discount Symbol ..... **1CD1C**

**Table 33-310. Brake Wheels**

| Wheel Size in Inches | Min. Bore in Inches (mm) | Max. Bore in Inches (mm) | Pilot Bore in Inches (mm) | WK <sup>2</sup> | Straight Bore <sup>③</sup>       |               |                 | Tapered Bore <sup>①</sup>        |               |                 |
|----------------------|--------------------------|--------------------------|---------------------------|-----------------|----------------------------------|---------------|-----------------|----------------------------------|---------------|-----------------|
|                      |                          |                          |                           |                 | Base <sup>②</sup> Catalog Number | Finished Bore | Pilot Bore Only | Base <sup>②</sup> Catalog Number | Finished Bore | Pilot Bore Only |
|                      |                          |                          |                           |                 |                                  | Price U.S. \$ | Price U.S. \$   |                                  | Price U.S. \$ | Price U.S. \$   |
| 4.0                  | .50 (12.7)               | 1.38 (35.1)              | .50 (12.7)                | .06             | 511H1150                         | *             | 235.00          | 511H1151                         | *             | 472.00          |
| 5.5                  | .75 (19.1)               | 2.00 (50.8)              | .75 (19.1)                | .26             | 511H1160                         | *             | 383.00          | 511H1161                         | *             | 650.00          |
| 7.0                  | 1.00 (25.4)              | 2.25 (57.2)              | .75 (19.1)                | .77             | 511H1170                         | *             | 570.00          | 511H1171                         | *             | 860.00          |
| 10.0                 | 1.38 (35.1)              | 2.88 (73.2)              | 1.13 (28.7)               | 3.10            | 511H1190                         | *             | 1,245.00        | 511H1191                         | *             | 1,685.00        |

- ① Taper is at rate of 1.25 inches per foot on diameter. In bore size selection, use diameter of tapered shaft. Bore tolerance: +.000 -.005 inches.
- ② Add Suffix Number for bore size to Base Catalog Number.
- ③ Bore tolerance: +.000 -.001 inches.

**Table 33-311. Brake Wheel Suffix Numbers**

| Bore Size Suffix Number — Add to Base Catalog Number                        |                  |               |                                  |                       |               |
|---|------------------|---------------|----------------------------------|-----------------------|---------------|
| Bore <sup>④</sup> in Inches (mm)  | Keyway in Inches | Suffix Number | Bore <sup>④</sup> in Inches (mm) | Keyway in Inches (mm) | Suffix Number |
| <b>Standard Bore Sizes — No Price Addition</b>                              |                  |               |                                  |                       |               |
| Pilot Bore  | None             | -1            | 1.625 (41.28)                    | 3/38 x 3/16           | -9            |
| .625 (15.88)  | 3/16 x 3/32      | -2            | 1.875 (47.63)                    | 1/2 x 1/4             | -10           |
| .750 (19.05)  | 3/16 x 3/32      | -3            | 2.125 (53.98)                    | 1/2 x 1/4             | -11           |
| .875 (22.23)  | 3/16 x 3/32      | -4            | 2.375 (60.33)                    | 5/8 x 5/16            | -12           |
| 1.000 (25.40)   | 1/4 x 1/8        | -5            | 2.500 (63.50)                    | 5/8 x 5/16            | -63           |
| 1.125 (28.58)   | 1/4 x 1/8        | -6            | 2.625 (66.68)                    | 5/8 x 5/16            | -13           |
| 1.250 (31.75)   | 1/4 x 1/8        | -7            | 2.750 (69.85)                    | 5/8 x 5/16            | -18           |
| 1.375 (34.93)   | 5/16 x 5/32      | -8            | 2.875 (73.03)                    | 3/4 x 3/8             | -14           |
| <b>Non-standard Bore Sizes — Make Necessary Price Addition <sup>⑤</sup></b> |                  |               |                                  |                       |               |
| .500 (12.70)  | 1/8 x 1/16       | -50           | 1.687 (42.85)                    | 3/8 x 3/16            | -58           |
| .750 (19.05)  | 1/4 x 1/8        | -51           | 1.750 (44.45)                    | 3/8 x 3/16            | -59           |
| .875 (22.23)  | 1/4 x 1/8        | -52           | 1.937 (49.20)                    | 1/2 x 1/4             | -60           |
| 1.000 (25.40)   | 5/16 x 5/32      | -53           | 2.000 (50.80)                    | 1/2 x 1/4             | -61           |
| 1.187 (30.15)   | 1/4 x 1/8        | -54           | 2.250 (57.15)                    | 1/2 x 1/4             | -62           |
| 1.375 (34.93)   | 3/8 x 3/16       | -55           | —                                | —                     | —             |
| 1.437 (36.50)   | 3/8 x 3/16       | -56           | —                                | —                     | —             |
| 1.500 (38.10)   | 3/8 x 3/16       | -57           | —                                | —                     | —             |

- ④ Bore size selected must be between minimum and maximum dimensions listed in brake wheel selection table.
- ⑤ Price Additions

| Description          | Adder U.S. \$ |
|----------------------|---------------|
| 4.0 Inch (101.6 mm)  | 70.50         |
| 5.5 Inch (139.7 mm)  | 92.50         |
| 7.0 Inch (177.8 mm)  | 123.00        |
| 10.0 Inch (254.0 mm) | 189.00        |

\*Please contact your local Eaton sales office.