Introduction to Armature Actuated Brakes (AAB)

The Armature Actuated Brakes are spring-set, electrically released, friction devices, which develop holding and braking torque in the absence of electrical power. This type of brake can decelerate and hold a rotational load or can be ordered to provide a holding function only, where the motor is used as the dynamic brake.

AAB's are available to meet a wide range of braking requirements. Available sizes range from 3 lb-in up to 300 lb-ft static torque, in a variety of mounting options. A short hub is available for face mounting or to provide for maximum space efficiency. Features include Class H magnet wire coils, corrosion resistance, and optional manual release lever. Custom designs and modifications are possible; consult the factory for more information.
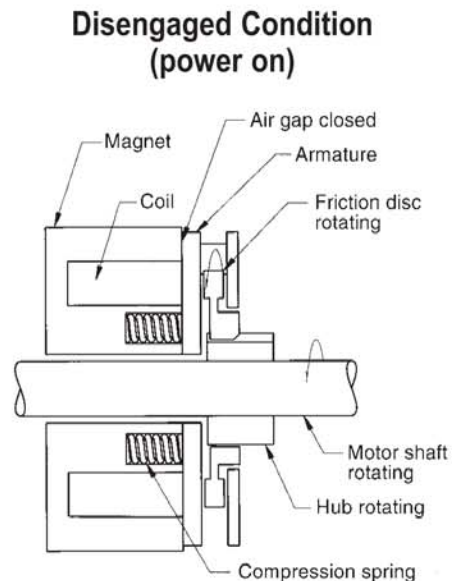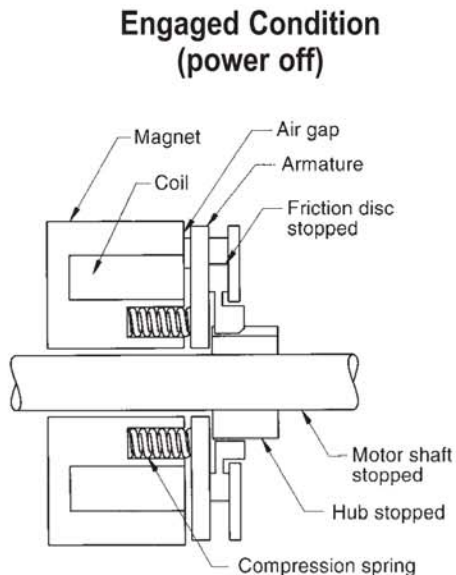
Operating Principle

A hub which is attached to the shaft supports the rotatable friction disc. Brake torque is developed when springs apply a clamping force between the brake armature, friction disc and pressure plate. When electrical power is applied, the armature is pulled by the electromagnetic force in the magnet body assembly which overcomes spring action allowing the friction disc to rotate freely. When electrical power is interrupted, the electromagnetic force is removed and the pressure spring will mechanically force the armature plate to clamp the friction disc between itself and the pressure plate, thereby torque is developed.

Engaged Condition
(power off)

- Magnet
- Air gap
- Coil
- Armature
- Friction disc stopped
- Motor shaft stopped
- Hub stopped
- Compression spring

Disengaged Condition
(power on)

- Magnet
- Air gap closed
- Coil
- Armature
- Friction disc rotating
- Motor shaft rotating
- Hub rotating
- Compression spring

Product Overview

Series 310 & 311

Delivers high torque in a compact package for servo and stepper motor applications

Sizes ranging from 8 to 400 lb-in, (.9 to 45.2 Nm) of torque

Series 331 & 333 NEMA C-Face

• Adaptors for NEMA frame sizes 48C through 405TC/UC
• Enclosed version available in NEMA 48C through 215TC

Series 320

Commercial duty, for small gear motors

Sizes ranging from 3 to 50 lb-in (.34 to 5.6 Nm) of torque

Series 350

Pressure plate mounted, IP56 enclosure, ideal for Portal Crane applications.

Torque sizes ranging from 75-300 lb-ft (102-400 Nm).

Series 321 Totally - Enclosed Non-ventilated (TENV) & Series 322 IP54 Enclosure

Sizes from 3 to 72 lb-in (.34 to 8.1 Nm) of torque

Series 360

Magnet-body mounted brake in an IP-56 enclosure. Ideal for Portal Crane applications.

Torque sizes ranging from 60-300 lb-ft (80-400 Nm).

Series 321 NEMA C TENV

Direct mounting to 48C and 56C motors

Sizes from 1.5 to 25 lb-ft (2 to 34 Nm) of torque

Proving Switches and AC Rectifiers

For use with AAB Series 333, 350, and 360

Series 331 & 333

High performance brake for metric/IEC applications.

Direct drop-in for Kebco, Lenze, and Binder.

Sizes ranging from 3 to 300 lb-ft, (4 to 400 Nm) of torque

Distributed By

McLaughlin Hoist & Crane

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Armature Actuated Brakes (AAB) Torque Selection

Select the proper torque rating based on horsepower and rpm (speed at the clutch or brake) using the *Torque Selection Chart* below. Based on 1.4 service factor.

For other service factors and speeds, use the formulas shown below.

Formula for TABLE 1

$$T = \frac{63,025 \times P}{N} \times SF$$

T = Static torque, lb-in.

P = Horsepower, hp

N = Shaft speed at brake, rpm

SF = Service Factor

63,025 = Constant

Formula for TABLE 2

$$T = \frac{5,252 \times P}{N} \times SF$$

T = Static torque, lb-ft.

P = Horsepower, hp

N = Shaft speed at brake, rpm

SF = Service Factor

5,252 = Constant

Caution: Do not use Table 1 to select brakes for overhauling or high inertial loads, or where a stop in specified time or distance is required. For these applications the total inertia of the load and power transmission system must be determined to make a brake selection. Refer to sections on torque and thermal ratings and determination.

NOTE: Series 310 and 311 for holding applications only.

TABLE 1
Series 320, 321, 322 Static Torque in lb-in. *(Nm)*

Motor hp	rpm									
	600	800	1000	1200	1500	1800	2000	2400	3000	3600
	Static Torque lb-in *(Nm)*									
1/20	18 (2.03)	7 (.79)	7 (.79)	7 (.79)	3 (.34)	3 (.34)	3 (.34)	3 (.34)	3 (.34)	3 (.34)
1/12	18 (2.03)	18 (2.03)	7 (.79)	7 (.79)	7 (.79)	7 (.79)	7 (.79)	3 (.34)	3 (.34)	3 (.34)
1/8	35 (3.95)	18 (2.03)	18 (2.03)	18 (2.03)	18 (2.03)	7 (.79)	7 (.79)	7 (.79)	7 (.79)	3 (.34)
1/6	35 (3.95)	35 (3.95)	18 (2.03)	18 (2.03)	18 (2.03)	18 (2.03)	18 (2.03)	7 (.79)	7 (.79)	7 (.79)
1/4	—	35 (3.95)	35 (3.95)	35 (3.95)	18 (2.03)	18 (2.03)	18 (2.03)	18 (2.03)	18 (2.03)	7 (.79)
1/3	—	—	35 (3.95)	35 (3.95)	35 (3.95)	18 (2.03)	18 (2.03)	18 (2.03)	18 (2.03)	18 (2.03)
1/2	—	—	—	—	35 (3.95)	35 (3.95)	35 (3.95)	35 (3.95)	18 (2.03)	18 (2.03)
3/4	—	—	—	—	—	—	35 (3.95)	35 (3.95)	35 (3.95)	35 (3.95)
1	—	—	—	—	—	—	—	—	—	35 (3.95)

TABLE 2
Series 333/350/360 Static Torque in lb-ft. *(Nm)*

Motor hp *(kw)*	rpm									
	600	800	1000	1200	1500	1800	2000	2400	3000	3600
	Static Torque lb-ft *(Nm)*									
1/3 (.25)	6 (8)	6 (8)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)
1/2 (.37)	12 (16)	6 (8)	6 (8)	6 (8)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)
3/4 (.55)	12 (16)	12 (16)	6 (8)	6 (8)	6 (8)	6 (8)	3 (4)	3 (4)	3 (4)	3 (4)
1 (.75)	25 (34)	12 (16)	12 (16)	12 (16)	6 (8)	6 (8)	6 (8)	6 (8)	6 (8)	3 (4)
1-1/2 (1.1)	25 (34)	25 (34)	12 (16)	12 (16)	12 (16)	12 (16)	6 (8)	6 (8)	6 (8)	6 (8)
2 (1.5)	25 (34)	25 (34)	25 (34)	25 (34)	12 (16)	12 (16)	12 (16)	6 (8)	6 (8)	6 (8)
3 (2.2)	45 (60)	45 (60)	25 (34)	25 (34)	25 (34)	25 (34)	12 (16)	12 (16)	12 (16)	12 (16)
5 (3.7)	60 (80)	60 (80)	45 (60)	45 (60)	25 (34)	25 (34)	25 (34)	25 (34)	25 (34)	12 (16)
7-1/2 (5.6)	110 (150)	110 (150)	60 (80)	60 (60)	45 (60)	45 (60)	45 (60)	25 (34)	25 (34)	25 (34)
10 (7.5)	180 (240)	110 (150)	110 (150)	110 (150)	60 (80)	45 (60)	45 (60)	45 (60)	25 (34)	25 (34)
15 (11.2)	300 (400)	180 (240)	110 (150)	110 (150)	110 (150)	60 (80)	60 (80)	60 (80)	45 (60)	45 (60)
20 (14.9)	300 (400)	180 (240)	180 (240)	180 (240)	110 (150)	110 (150)	110 (150)	60 (80)	60 (80)	60 (80)
25 (18.6)	—	300 (400)	180 (240)	180 (240)	180 (240)	110 (150)	*	*	*	*
30 (22.4)	—	300 (400)	300 (400)	300 (400)	180 (240)	180 (240)	*	*	*	*
40 (29.8)	—	—	300 (400)	300 (400)	300 (400)	180 (240)	*	*	*	*
50 (37.3)	—	—	—	—	300 (400)	300 (400)	*	*	*	*
60 (44.7)	—	—	—	—	300 (400)	300 (400)	*	*	*	*

* Exceeds maximum speed rating.