Caliper Disc Brakes

for applications requiring static and/or dynamic braking

Spring Apply, Hydraulic Apply, and Mechanical Apply Brakes
Why choose MICO?

MICO, Inc. designs, manufactures and markets hydraulic components, controls, and brake systems primarily for off-road markets. We have manufacturing facilities in:

- North Mankato, Minnesota U.S.A.
- Ontario, California U.S.A.
- Empalme, Sonora, Mexico

Many of the world’s largest off-highway OEMs value the knowledgeable staff at MICO and work with us to make their products better. Our custom-engineered products are designed with the customer requirements as the primary driver. It is our intent to help customers build their systems with our expertise in hydraulic components, braking systems and controls.

Our goal is to meet or exceed our customers' expectations in every aspect of our business.

Product lines we specialize in include:

- Actuators
- Brake Locks
- Brakes
- Controls
- Cylinders
- Electrohydraulics
- Master Cylinders
- Valves

MICO is proud to be ISO 9001 and ISO 14001 certified and continuously strive for improvement while remaining a quality leader in our field. We have been a successful business for over 60 years. Privately owned, customer driven. We look forward to working with you!

Caliper Disc Brakes

MICO® Caliper Disc Brakes are extensively tested to assure that our customers are receiving a high quality product. MICO uses only high grade materials in the construction of caliper disc brakes. Computer technology is employed in the analysis and selection of component parts.

The MICO® Caliper Disc Brake line is divided into the following series:

**515 Series** are a floating caliper type and are available in spring apply, hydraulic apply or mechanical apply models.

**520 Series** are fixed caliper disc brakes, hydraulic apply with opposed piston.

**530 Series** are a floating caliper type and are available in spring apply or hydraulic apply models.

The 515 Series caliper brakes can be used for limited dynamic or service braking as well as static or parking brake applications. The Spring Apply/Hydraulic Release designs use a stack of belleville springs to apply the brake and hydraulic pressure from a source such as a master cylinder to release the brake. The Mechanical Apply designs use a mechanical lever and cam system to apply and release the brake.

The 520 Series caliper brakes are used in service braking applications. The Hydraulic Apply Caliper Brakes use a modulated hydraulic pressure source, such as a master cylinder, to control brake torque. These brakes are available with various diameter actuation pistons. The larger the piston the greater the capacity for clamping force.

The 530 Series Spring Apply/Hydraulic Release Caliper Brakes are used in parking brake applications. They use a stack of belleville springs to apply the brake and hydraulic pressure to release the brake. Designed to be either on-or-off, conventional master cylinder actuation is not recommended to hydraulically release the brake. For hydraulic release actuation, refer to the MICO Hydraulic Remote Actuators catalog (Form No. 84-460-001). The 530 Series Hydraulic Apply Caliper Brakes are designed for use in dynamic or service braking and use a modulated hydraulic pressure source, such as a master cylinder.

Most types of MICO® Caliper Disc Brakes are available with seals and rubber components for use with automotive brake fluids, mineral base hydraulic oil, or special fluids. Consult MICO, Inc. for recommendations. All lining material used in the MICO® Caliper Disc Brakes is non-asbestos and lead free.

Complete the appropriate Application Data Sheet online, www.mico.com. The MICO Applications Department will analyze your specifications and based on your input recommend a caliper disc brake suitable for your requirements.
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NOTE
Torque curves and torque formulas in this catalog are based on static and dynamic lining coefficients of friction under properly adjusted, fully burnished, lining conditions and are theoretical in nature. Maximum torque will be achieved only after the brake has been properly burnished. Consult MICO, Inc. for Technical Notice (Form No. 81-950-016).

Recommended Disc Material

High quality brake discs should be used in conjunction with MICO Caliper Disc Brakes. Depending on strength and performance requirements, low to medium carbon steel is generally recommended. Fabrication procedures are as follows:

1. Flame cut or machined to required outside diameter with inside diameter machined to size.
2. Stress relieved after all machining operations.
3. Blanchard ground to a surface finish of 54 Ra to 72 Ra with a visible crosshatch pattern.
4. Surfaces to be parallel within 0.002 inch.
5. Surfaces to be flat within 0.005 inch.

This document is intended to provide general information about MICO Products. MICO, Inc. has attempted to present accurate information about MICO Products in its catalogs, brochures, and other printed materials. MICO, Inc. is not responsible for errors, inaccuracies, or inconsistencies that may exist in any catalog brochure or other printed materials or any damages arising from or related to reliance on information in them. Materials and specifications for MICO Products set forth in catalogs, brochures, and other printed materials are subject to change without notice or obligation. Refer to www.mico.com for the most recent versions of our literature. If you have any questions concerning MICO Products, please contact MICO, Inc. All MICO Products and service are sold and provided subject to the MICO Warranty at www.mico.com in effect on the date of sale or supply.
DESCRIPTION
Floating caliper type brake, spring applied, hydraulic release. Spring apply brakes are independent of outside energy sources such as air, hydraulic or mechanical forces. The stored energy is provided by a series of belleville springs.

Under normal conditions, the brake is installed independent of the service brake system. Ideal for industrial machines and mobile equipment applications.

These brakes are designed to operate as parking and/or emergency brakes. If your application requires rapid cycling consult MICO, Inc. for recommendations.

Consult MICO Applications Department for other models. See page 5 for disc diameter-vs-brake torque ratio charts.

Model Numbers

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<td>* 02-515-012</td>
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<td>** 03-515-014</td>
<td>** 03-515-016</td>
</tr>
<tr>
<td>** 03-515-018</td>
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</tr>
</tbody>
</table>

* Includes a rubber boot
** Includes a rubber boot and no. 4 SAE o-ring boss swivel fitting.

SPECIFICATIONS

- Disc diameter: 6 inch to unlimited
- Disc thickness: 0.50 inch - for other disc thicknesses contact MICO, Inc.
- Total lining contact area: 6.36 inch²
- Continuous duty pressure: 2000 PSI
- Intermittent duty pressure: 2500 PSI
- Full retraction volume: 0.20 inch³ maximum
- Caliper material: ductile iron
- Caliper finish: zinc chromate yellow
- Lining thickness: 0.22 inch
- Usable lining thickness: 0.22 inch
- Lining material: non-asbestos, lead free
- Porting: No. 4 SAE o-ring port per SAE J1926/1: 7/16-20
- Approximate weight: 4.2 lb

NOTES:
1. Model 02-515-002 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min if brake is used dynamically.
3. Mounting bolts not included.
Model: 02-515-002

TORQUE FORMULA \( (B_t = \text{Brake Torque}) \)
\[ B_t = 440 \times (\text{Disc Radius} - 1.00) \]
Complete Retraction Pressure: 600 PSI

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

Models: 02-515-004, 03-515-014

TORQUE FORMULA \( (B_t = \text{Brake Torque}) \)
\[ B_t = 250 \times (\text{Disc Radius} - 1.00) \]
Complete Retraction Pressure: 300 PSI

Models: 02-515-012, 02-515-119

TORQUE FORMULA \( (B_t = \text{Brake Torque}) \)
\[ B_t = 680 \times (\text{Disc Radius} - 1.00) \]
Complete Retraction Pressure: 700 PSI

Models: 02-515-008, 03-515-020, 03-515-018

TORQUE FORMULA \( (B_t = \text{Brake Torque}) \)
\[ B_t = 900 \times (\text{Disc Radius} - 1.00) \]
Complete Retraction Pressure: 1200 PSI

Models: 02-515-005, 02-515-006, 03-515-016

TORQUE FORMULA \( (B_t = \text{Brake Torque}) \)
\[ B_t = 1150 \times (\text{Disc Radius} - 1.00) \]
Complete Retraction Pressure: 1700 PSI
515 Series
Caliper
Disc Brake
(mechanical apply)

DESCRIPTION
Floating caliper type brake, mechanically applied. One piece carrier. Once brake is adjusted, the lever can be mounted in any position. Ideal for secondary, emergency, and industrial applications.
Consult MICO Applications Department for other models.

Model Numbers
02-515-148
02-515-150

SPECIFICATIONS
- Disc diameter: 6 inch to unlimited
- Disc thickness: 0.50 inch - for other disc thicknesses contact MICO, Inc.
- Total lining contact area: 6.36 inch²
- Caliper material: ductile iron
- Caliper finish: zinc chromate yellow
- Lining thickness: 0.22 inch
- Usable lining thickness: 0.22 inch
- Lining material: non-asbestos, lead free
- Lever movement: 40° either direction
- Lever pull: limited to 330 lb at hole
  limited to 420 lb at hole
- Approximate weight: 4.7 lb

Chart is based on using hole

![Chart](chart.png)

TORQUE FORMULA (Bt = Brake Torque)

\[
Bt = 10.69 \times \text{Lever Pull} \times (\text{Disc Radius} - 1.00)
\]

\[
Bt = 13.61 \times \text{Lever Pull} \times (\text{Disc Radius} - 1.00)
\]

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

NOTE:
1. Model 02-515-150 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min if brake is used dynamically.
3. Mounting bolts not included.
DESCRIPTION
Floating caliper, hydraulic apply type. Designed to provide braking for applications in the agricultural, construction, mining, and logging industries. High strength aluminum piston and module assembly.
Consult MICO Applications Department for other models.

Model Numbers
- Brake Fluid: 02-515-025
- Hydraulic Oil: 02-515-030

SPECIFICATIONS
- Disc diameter: 6 inch to unlimited
- Disc thickness: 0.50 inch - for other disc thicknesses contact MICO, Inc.
- Total lining contact area: 6.36 inch²
- Continuous duty pressure: 1500 PSI
- Intermittent duty pressure: 2000 PSI
- Actuating volume: 0.05 inch³ nominal
- Caliper material: ductile iron
- Caliper finish: zinc chromate yellow
- Lining thickness: 0.22 inch
- Usable lining thickness: 0.22 inch
- Lining material: non-asbestos, lead free
- Piston diameter: 1.50 inch
- Approximate weight: 3.8 lb
- Porting: 1/8-27NPTF

TORQUE FORMULA (Bt = Brake Torque)
Bt = PSI x 1.23 x (Disc Radius – 1.00)

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

NOTES:
1. Model 02-515-025 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min if brake is used dynamically.
3. Mounting bolts not included.

*"A" dimension = Disc Radius + 0.7/0.36
520 Series Caliper Disc Brake

DESCRIPTION
Fixed caliper disc brake, hydraulic apply with opposed hardcoat anodized aluminum pistons. The split caliper disc brakes are mounted using a spacer or torque member between the caliper halves. These brakes can also be purchased as a single caliper half assembly. In either case, the customer supplies fittings, tubing assembly, hardware, and spacer.

Designed for medium torque, drive line mounted, and stationary equipment applications.

Consult MICO Applications Department for other models.

SPECIFICATIONS
- Disc diameter: 9 inch to unlimited
- Disc thickness: 0.25 inch minimum
- Total lining contact area: 8.88 inch²
- Continuous duty pressure: 1500 PSI
- Intermittent duty pressure: 2000 PSI
- Actuating volume: 0.30 inch³ nominal
- Caliper material: ductile iron
- Caliper finish: zinc chromate
- Lining thickness: 0.56 inch
- Usable lining thickness: 0.48 inch
- Lining material: non-asbestos, lead free
- Piston diameter: 2.50 inch
- Approximate weight: 16 lb
- Porting: 1/8-27NPTF

NOTES:
1. Model 02-520-151 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min.
3. Mounting bolts not included.
520 Series Caliper Disc Brake

DESCRIPTION
Fixed caliper disc brake, hydraulic apply with opposed pistons. Split calipers with one piston per caliper half.

Brake torque is transmitted directly to the housing protecting the piston from side loads. Dust boot and o-ring seal protects hardcoat anodized aluminum piston from contaminants. Features quick-change type linings and internal porting.

Applications include pivotal steering assists, winch clutches, drivelines, various vehicles, and equipment requiring fade-free braking.

Consult MICO Applications Department for other models.

Model Numbers

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<thead>
<tr>
<th>Brake Fluid</th>
<th>Hydraulic Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-520-201</td>
<td>02-520-202</td>
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</table>

SPECIFICATIONS
- Disc diameter: 10 to 24 inches
- Disc thickness: 0.50 inch
- Total lining contact area: 15.74 inch²
- Continuous duty pressure: 1500 PSI
- Intermittent duty pressure: 2000 PSI
- Actuating volume:
  - 500 PSI / 0.32 inch³
  - 1000 PSI / 0.37 inch³
  - 1500 PSI / 0.45 inch³
  - 2000 PSI / 0.54 inch³
- Caliper material: aluminum
- Caliper finish: clear anodized
- Lining thickness: 0.37 inch
- Usable lining thickness: 0.37 inch
- Lining material: non-asbestos, lead free
- Piston diameter: 2.50 inch
- Approximate weight: 10 lb
- Porting: No. 4 SAE o-ring port per SAE J1926/1: 7/16-20

TORQUE FORMULA (Bt = Brake Torque)

\[
Bt = PSI \times 3.43 \times (\text{Disc Radius} - 1.25)
\]

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

NOTES:
1. Model 02-520-201 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min.
3. Mounting bolts not included.

"A" dimension = Disc Radius (Disc Diameter 10 to 12 inch)
"A" dimension = Disc Radius + 0.33 (Disc Diameter greater than 12 to 18 inch)
"A" dimension = Disc Radius + 0.48 (Disc Diameter greater than 18 to 24 inch)
DESCRIPTION
Fixed caliper, hydraulic apply with opposed pistons.

Flexibility of the split caliper design makes it possible to use a variety of disc thicknesses. This design also allows the brake to be mounted with the torque member between the caliper halves. In this case the torque member serves as the spacer.

Designed for use with vehicles or stationary equipment requiring fade-free braking. Also available as caliper half assembly, contact MICO, Inc.

Consult MICO Applications Department for other models.

Model Numbers

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<tbody>
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<td>02-520-261</td>
<td>02-520-260</td>
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<tr>
<td>02-520-265</td>
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</tbody>
</table>

SPECIFICATIONS

- Disc diameter: 12 to 36 inch (consult MICO, Inc. for larger sizes)
- Disc thickness: 0.50 inch 02-520-260
  0.50 inch 02-520-261
  1.00 inch 02-520-265
- Total lining contact area: 33.63 inch²
- Continuous duty pressure: 2000 PSI
- Intermittent duty pressure: 2500 PSI
- Actuating volume:
  500 PSI / 0.38 inch³
  1000 PSI / 0.49 inch³
  1500 PSI / 0.59 inch³
  2000 PSI / 0.68 inch³
  2500 PSI / 0.79 inch³
- Caliper material: ductile iron
- Caliper finish: electroless nickel
- Lining thickness: 0.37 inch
- Usable lining thickness: 0.37 inch
- Lining material: non-asbestos, lead free
- Piston diameter: 3.50 inch
- Porting: No. 4 SAE o-ring port per SAE J1926/1: 7/16-20
- Approximate weight: 22 lb

NOTES:
1. Model 02-520-260 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min.
3. Mounting bolts not included.

TORQUE FORMULA (Bt = Brake Torque)

\[ Bt = PSI \times 6.72 \times (Disc \ Radius - 2.00) \]

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).
**DESCRIPTION**

Fixed caliper, hydraulic apply with opposed pistons. One piece single caliper with internally ported fluid passages to both hardcoat anodized aluminum pistons.

Consult MICO Applications Department for other models.

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**SPECIFICATIONS**

- **Disc diameter:** 9 to 36 inch
- **Disc thickness:** 0.50 inch
- **Total lining contact area:** 7.82 inch²
- **Continuous duty pressure:** 1500 PSI
- **Intermittent duty pressure:** 2000 PSI
- **Actuating volume:**
  - 500 PSI / 0.30 inch³
  - 1000 PSI / 0.40 inch³
  - 1500 PSI / 0.43 inch³
  - 2000 PSI / 0.48 inch³
- **Caliper material:** ductile iron
- **Caliper finish:** zinc chromate yellow
- **Lining thickness:** 0.50 inch
- **Usable lining thickness:** 0.44 inch
- **Lining material:** non-asbestos, lead free
- **Piston diameter:** 2.37 inch
- **Porting:** No. 4 SAE o-ring port per SAE J1926/1: 7/16-20
- **Approximate weight:** 14 lb

**TORQUE FORMULA** (Bt = Brake Torque)

\[ Bt = \text{PSI} \times 3.09 \times (\text{Disc Radius} - 1.187) \]

**NOTE:** Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).
DESCRIPTION
This 520 Series MICO Brake is used in service braking applications. It uses a modulated hydraulic pressure source, such as a master cylinder, to control brake torque. The brake can also be mounted in virtually any position. The cross-over tube allows hydraulic pressure to the two caliper halves to actuate the piston in each half. This brake has a lining retractor mechanism which reduces unnecessary lining wear by maintaining a constant lining to rotor disc clearance distance while the brake is not applied.

Consult MICO Applications Department for other models.

SPECIFICATIONS
- Disc diameter: 10 inch to unlimited
- Disc thickness: 1.00 inch
- Total lining contact area: 12.4 inch²
- Continuous duty pressure: 1000 PSI
- Intermittent duty pressure: 1500 PSI
- Actuating volume: 0.25 in²
- Caliper material: ductile iron
- Caliper finish: vinyl primer
- Lining thickness: 0.66 inch
- Usable lining thickness: 0.32 inch
- Lining material: non-asbestos, lead free
- Piston diameter: 2.25 inch
- Porting: #4 SAE o-ring port per SAE J1926/1: 7/16-20
- Approximate weight: 17 lb

TORQUE FORMULA (Bt = Brake Torque)

\[ Bt = \text{PSI} \times 2.78 \times (\text{Disc Radius} - 1.20) \]

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).
530 Series
Caliper
Disc Brake
(3000 lb)

DESCRIPTION
Floating caliper, spring apply, hydraulic release design. Caliper can be reversed on mounting bracket.

The brakes shown are designed to operate as parking and/or emergency brakes. If your application requires rapid cycling please consult MICO, Incorporated for recommendations.

Consult MICO Applications Department for other models.

Model Numbers

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</table>

* No mounting bracket, contact MICO for mounting information.

SPECIFICATIONS

- Disc diameter: 9 inch to unlimited
- Disc thickness: 0.31 to 0.50 inch
- Total lining contact area: 7.82 inch²
- Continuous duty pressure: 2000 PSI
- Intermittent duty pressure: 2500 PSI
- Full retraction volume: 0.80 inch³ maximum
- Caliper material: ductile iron
- Caliper finish: zinc chromate yellow
- Lining thickness: 0.37 inch
- Usable lining thickness: 0.28 inch
- Lining material: non-asbestos, lead free
- Piston diameter: 3.50 inch
- Porting: No. 4 SAE o-ring port per SAE J1926/1: 7/16-20
- Approximate weight: 20 lb

MOUNTING STYLES

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(See page 14 for dimensions)

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

TORQUE FORMULA (Bt = Brake Torque)

\[ Bt = 1920 \times (\text{Disc Radius} - 1.18) \]

Complete Retraction Pressure: 1000 PSI

NOTES:
1. Model 02-530-306 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min if brake is used dynamically.
3. Mounting bolts not included.

TRIANGULAR MOUNT

\[ "A" \text{ dimension} = \text{Disc Radius} + \frac{3.1}{0.12} \]

RECTANGULAR MOUNT

\[ "A" \text{ dimension} = \text{Disc Radius} + \frac{41.2}{1.66} \] (for 9 to 15 inch Diameter Discs)

\[ "A" \text{ dimension} = \text{Disc Radius} + \frac{44.5}{1.75} \] (for greater than 15 inch to unlimited Diameter Discs)
DESCRIPTION

Floating caliper, spring apply, hydraulic release design. Caliper can be reversed on mounting bracket.

The brakes shown are designed to operate as parking and/or emergency brakes. If your application requires rapid cycling please consult MICO, Inc. for recommendations.

Consult MICO Applications Department for other models.

SPECIFICATIONS

- Disc diameter: 9 inch to unlimited
- Disc thickness: 0.31 to 0.50 inch
- Total lining contact area: 7.82 inch²
- Continuous duty pressure: 2000 PSI
- Intermittent duty pressure: 2500 PSI
- Full retraction volume: 0.80 inch³ maximum
- Caliper material: ductile iron
- Caliper finish: zinc chromate yellow
- Lining thickness: 0.37 inch
- Usable lining thickness: 0.28 inch
- Lining material: non-asbestos, lead free
- Porting: No. 4 SAE o-ring port per SAE J1926/1: 7/16-20
- Approximate weight: 20 lb

MOUNTING STYLES

<table>
<thead>
<tr>
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<td>03-530-629</td>
<td>03-530-628</td>
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</tbody>
</table>

* No mounting bracket, contact MICO for mounting information.

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

TORQUE FORMULA (Bt = Brake Torque)

\[ Bt = 3840 \times (\text{Disc Radius} - 1.18) \]

Complete Retraction Pressure: 1500 PSI

NOTES:

1. Model 03-530-628 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min if brake is used dynamically.
3. Mounting bolts not included.
**DESCRIPTION**

Floating caliper, spring apply, hydraulic release design. The brake shown is designed to operate as parking and/or emergency brake. If your application requires rapid cycling please consult MICO, Inc. for recommendations. Consult MICO Applications Department for other models.

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**SPECIFICATIONS**

- **Disc diameter:** 9 inch to unlimited
- **Disc thickness:** 0.50 inch
- **Total lining contact area:** 9.40 inch²
- **Continuous duty pressure:** 2000 PSI
- **Intermittent duty pressure:** 2500 PSI
- **Full retraction volume:** 4.53 inch³ maximum
- **Caliper material:** ductile iron
- **Caliper finish:** zinc chromate yellow
- **Usable lining thickness:** 0.15 inch
- **Lining material:** non-asbestos, lead free
- **Porting:** No. 4 SAE o-ring port per SAE J1926/1: 7/16-20
- **Approximate weight:** 37 lb

**TORQUE FORMULA** (Bt = Brake Torque)

- Bt (new) = 6225 x (Disc Radius – 1.31)
- Bt (worn) = 4895 (Disc Radius – 1.31)

Complete Retraction Pressure: 1000 PSI

**NOTE:** Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

**NOTES:**

1. Model 03-530-904 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min if brake is used dynamically.
3. Mounting bolts not included.
530 Series
Caliper
Disc Brake

DESCRIPTION
Floating caliper, hydraulic apply design. Caliper may be reversed on mounting bracket.
Consult MICO Applications Department for other models.

SPECIFICATIONS
- Disc diameter: 9 inch to unlimited
- Disc thickness: 0.50 inch
- Total lining contact area: 7.82 inch²
- Continuous duty pressure: 1500 PSI
- Intermittent duty pressure: 2000 PSI
- Caliper material: ductile iron
- Caliper finish: zinc chromate yellow
- Lining thickness: 0.37 inch
- Usable lining thickness: 0.30 inch
- Lining material: non-asbestos, lead free
- Piston diameter: 2.37 inch
- Porting: No. 4 SAE o-ring port per SAE J1926/1: 7/16-20
- Approximate weight: 16 lb

MOUNTING STYLES
02-530-040
02-530-045
03-530-040
03-530-045
(See page 14 for dimensions)

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</tbody>
</table>
* No mounting bracket, contact MICO for mounting information.

TORQUE FORMULA (Bt = Brake Torque)
Bt = PSI x 2.72 x (Disc Radius – 1.18)

NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

NOTES:
1. Model 03-530-045 shown, dimensions will vary slightly between units and are to be used for reference purposes only.
2. Disc rubbing speed not to exceed 5000 ft/min if brake is used dynamically.
3. Mounting bolts not included.
USEFUL FORMULAS
See page 18 for conversion factors.

NOTES:

1. To convert a known percent of grade into the sine of the angle of the grade, see table on page 19.

2. The formulas shown on this page estimate torque and energy requirements and may be helpful with brake selection, however, many factors affect brake performance and are not considered in the equations. Some of these factors are:
   - road conditions
   - tire performance
   - engine drag
   - vehicle inertia
   - duty cycle
   - disc speed
   - lining wear
   - environment

Contact MICO, Inc. for a basic recommendation.

Vehicle Application

Torque Required to Hold a Vehicle on an Incline

\[ T = WR \sin \theta \]

Where:
- \( T \) = Total torque required (lb \cdot in)
- \( W \) = Gross vehicle weight (lb)
- \( R \) = Rolling radius (in)
- \( \sin \theta \) = Sine of the angle of the grade (See Note 1)

Torque Required to Stop a Moving Vehicle

\[ T = WR \left( \frac{d}{g} + \sin \theta \right) \]

Where:
- \( T \) = Total torque required (lb \cdot in)
- \( W \) = Gross vehicle weight (lb)
- \( R \) = Rolling radius (in)
- \( \sin \theta \) = Sine of the angle of the grade (See Note 1)
- \( g \) = Acceleration due to gravity (32.2 ft/sec\(^2\))
- \( d \) = Deceleration rate (ft/sec\(^2\))

And:
\[ d = \frac{V^2}{2s} = \frac{V}{t} \]

Where:
- \( V \) = Vehicle velocity at instant of brake application (ft/sec)
- \( s \) = Stopping distance (ft)
- \( t \) = Stopping time (sec)

Torque Required per Brake

\[ Bt = \frac{T}{NB} \]

Where:
- \( Bt \) = Torque required per brake (lb \cdot in)
- \( T \) = Total torque required (lb \cdot in)
- \( NB \) = Number of brakes

Torque Required if Gear Reduction is Used

\[ Bt = \frac{T}{GR} \]

Where:
- \( Bt \) = Brake torque required (lb \cdot in)
- \( T \) = Total torque required (lb \cdot in)
- \( GR \) = Gear reduction ratio

Kinetic Energy Required to Stop a Moving Vehicle

\[ KE = \frac{WV^2}{2g} \]

Where:
- \( KE \) = Kinetic energy (ft \cdot lb)
- \( W \) = Gross vehicle weight (lb)
- \( V \) = Vehicle speed (ft/sec)
- \( g \) = Acceleration due to gravity (32.2 ft/sec\(^2\))

Stationary Equipment Application

Torque Required to Stop a Rotating Mass

\[ T = \frac{0.039WK^2N}{t} \]

Where:
- \( T \) = Torque (lb \cdot in)
- \( W \) = Weight of rotating members (lb)
- \( K \) = Radius of gyration of rotating members (ft)
- \( N \) = RPM
- \( t \) = Stopping time required (sec)

Kinetic Energy Required to Stop a Rotating Mass

\[ KE = \frac{WK^2N^2}{5872} \]

Where:
- \( KE \) = Kinetic energy (ft \cdot lb)
- \( W \) = Weight of rotating member (lb)
- \( K \) = Radius of gyration of rotating member (ft)
- \( N \) = RPM

Constant Drag Application

\[ T = \frac{63.025\text{ hp}}{N} \]

Where:
- \( T \) = Total torque required (lb \cdot in)
- \( \text{hp} \) = Horsepower
- \( N \) = RPM
# Conversion Factors

## Torque

<table>
<thead>
<tr>
<th>lb·ft</th>
<th>lb·in</th>
<th>daN·m</th>
<th>N·m</th>
<th>kg·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>0.1356</td>
<td>1.365</td>
<td>0.1382</td>
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<tr>
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<td>9.806</td>
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## Pressure

<table>
<thead>
<tr>
<th>PSI</th>
<th>MPa</th>
<th>bar</th>
<th>kPa</th>
<th>kg/mm²</th>
<th>kg/cm²</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.06895</td>
<td>6.895</td>
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<td>145</td>
<td>1</td>
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<td>1000</td>
<td>0.102</td>
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<td>14.50</td>
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<td>1.02</td>
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<td>98.07</td>
<td>9807</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>14.22</td>
<td>0.09807</td>
<td>0.9807</td>
<td>98.07</td>
<td>0.01</td>
<td>1</td>
</tr>
</tbody>
</table>

1 Atmosphere = 14.7 lb/in²  
1 Atmosphere = 29.92 inches of Mercury  
1 Atmosphere = 33.96 ft of water  
1 inch of Mercury = 0.491 lb/in² = 13.6 inches of water  
1 PSI = 2.0416 inches of Mercury at 62 °F

## Energy

<table>
<thead>
<tr>
<th>ft·lb</th>
<th>kgf·m</th>
<th>kW·hr</th>
<th>hp·hr</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1383</td>
<td>3.766e-7</td>
<td>5.051e-7</td>
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<tr>
<td>7.233</td>
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<td>1980000</td>
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<td>0.7376</td>
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<td>2.778e-7</td>
<td>3.725e-7</td>
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</tbody>
</table>

1 BTU = British thermal unit = heat required to raise temperature of 1 lb of water 1 °F  
1 BTU = 778.17 ft·lb

## Velocity

<table>
<thead>
<tr>
<th>m/sec</th>
<th>ft/s</th>
<th>km/hr</th>
<th>MPH</th>
<th>ft/min</th>
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</thead>
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<td>3.6</td>
<td>2.237</td>
<td>196.85</td>
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<td>1</td>
<td>1.097</td>
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<td>0.2778</td>
<td>0.9113</td>
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<td>0.4470</td>
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<tr>
<td>0.00508</td>
<td>0.01667</td>
<td>0.01829</td>
<td>0.01136</td>
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## Area

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<th>in²</th>
<th>cm²</th>
<th>mm²</th>
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</thead>
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<td>6.452</td>
<td>645.2</td>
</tr>
<tr>
<td>0.1550</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>0.001550</td>
<td>0.01</td>
<td>1</td>
</tr>
</tbody>
</table>

## Power

<table>
<thead>
<tr>
<th>hp</th>
<th>kW</th>
<th>met·hp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.7457</td>
<td>1.014</td>
</tr>
<tr>
<td>1.341</td>
<td>1</td>
<td>1.360</td>
</tr>
<tr>
<td>0.9863</td>
<td>0.7355</td>
<td>1</td>
</tr>
</tbody>
</table>

1 hp = 550 ft·lb/s  
1 hp = 33,000 ft·lb/min  
1 hp = 42.44 BTU/min

## Temperature

°F = (°C x 1.8) + 32  
°C = (°F - 32) ÷ 1.8

---

continued . . .
## GRADE

<table>
<thead>
<tr>
<th>Percent of Grade</th>
<th>θ (Degrees)</th>
<th>sin θ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0° 34'</td>
<td>0.0100</td>
</tr>
<tr>
<td>2</td>
<td>1° 09'</td>
<td>0.0200</td>
</tr>
<tr>
<td>3</td>
<td>1° 43'</td>
<td>0.0300</td>
</tr>
<tr>
<td>4</td>
<td>2° 17'</td>
<td>0.0400</td>
</tr>
<tr>
<td>5</td>
<td>2° 52'</td>
<td>0.0499</td>
</tr>
<tr>
<td>6</td>
<td>3° 26'</td>
<td>0.0599</td>
</tr>
<tr>
<td>7</td>
<td>4° 00'</td>
<td>0.0698</td>
</tr>
<tr>
<td>8</td>
<td>4° 34'</td>
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<tr>
<td>9</td>
<td>5° 09'</td>
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<td>10</td>
<td>5° 43'</td>
<td>0.0995</td>
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<tr>
<td>11</td>
<td>6° 17'</td>
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<td>12</td>
<td>6° 51'</td>
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<td>7° 24'</td>
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<td>15</td>
<td>8° 32'</td>
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<tr>
<td>16</td>
<td>9° 05'</td>
<td>0.1580</td>
</tr>
<tr>
<td>17</td>
<td>9° 39'</td>
<td>0.1676</td>
</tr>
<tr>
<td>18</td>
<td>10° 12'</td>
<td>0.1772</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent of Grade</th>
<th>θ (Degrees)</th>
<th>sin θ</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>10° 45'</td>
<td>0.1867</td>
</tr>
<tr>
<td>20</td>
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<tr>
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<tr>
<td>22</td>
<td>12° 24'</td>
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<tr>
<td>23</td>
<td>12° 57'</td>
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<td>13° 30'</td>
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<tr>
<td>25</td>
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</tr>
<tr>
<td>26</td>
<td>14° 34'</td>
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</tr>
<tr>
<td>27</td>
<td>15° 07'</td>
<td>0.2607</td>
</tr>
<tr>
<td>28</td>
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<td>0.2696</td>
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<tr>
<td>29</td>
<td>16° 10'</td>
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<td>35</td>
<td>19° 17'</td>
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<tr>
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<td>21° 48'</td>
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<tr>
<td>45</td>
<td>24° 14'</td>
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<td>26° 34'</td>
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</tr>
<tr>
<td>60</td>
<td>30° 58'</td>
<td>0.5145</td>
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</table>
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North Mankato, MN, U.S.A. 56003-2507
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