



Caliper Disc Brakes

for applications requiring
static and/or dynamic braking



*Spring Apply, Hydraulic Apply,
and Mechanical Apply Brakes*

Why choose MICO?

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

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

Many of the world's largest off-highway OEMs trust 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 braking systems and components.

With this level of attention, our customers are assured they are getting the most appropriate product for their system.

Product lines we specialize in include:

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

MICO is proud to be ISO 9001:2000 certified and we 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, Incorporated for recommendations. All lining material used in the MICO Caliper Disc Brakes is non-asbestos and lead free.

How to use this Catalog

This catalog is designed to introduce you to a selection of MICO Caliper Disc Brakes that may best suit your application. Complete the Application Data Sheet (page 21) and mail or fax it to us. The Application Data Sheet (Form No. 80-950-022) is also online at www.mico.com. The MICO Applications Department will analyze your specifications and recommend a caliper brake most suitable to the requirements.

Separate sections for each type of disc brake we manufacture are presented. Each section contains a description,

specifications, mounting styles, torque formula, section drawing and exterior dimensional drawing.

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, Incorporated for Technical Notice Form No. 81-950-016).

Catalog Index

Why choose MICO	Page 2
How to use this Catalog	Page 3
Recommended Disc Material	Page 3
515 Series Brakes	
Spring Apply	Pages 4 & 5
Mechanical Apply	Page 6
Hydraulic Apply	Page 7
520 Series Brakes	Pages 8 - 11
530 Series Brakes	
Spring Apply (3000 lb)	Page 12
Spring Apply (6000 lb)	Page 13
Spring Apply (9000 lb)	Page 14
Hydraulic Apply	Page 15
Useful Formulas	Page 16
Conversion Factors	Page 17 & 18
520 & 530 Series	
Cross Reference	Page 19
Application Data Sheet	Pages 21 & 22

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 R_a to 72 R_a with a visible crosshatch pattern.
4. Surfaces to be parallel within 0.002 inch.
5. Surfaces to be flat within 0.005 inch.

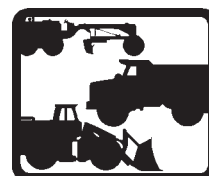
Applications



Swing Boom Equipment



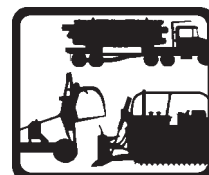
Agricultural Equipment



Heavy Construction Equipment



Mining Equipment



Forestry Equipment



In-Plant & Warehouse Equipment



Airport Support Vehicles



515 SERIES CALIPER DISC BRAKE

(Spring Apply)

Model Numbers

Brake Fluid

02-515-005
* 02-515-119

Hydraulic Oil

02-515-002
02-515-004
02-515-006
02-515-008
* 02-515-012
* 02-515-020
** 03-515-014
** 03-515-016
** 03-515-018

* Includes a rubber boot

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

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.

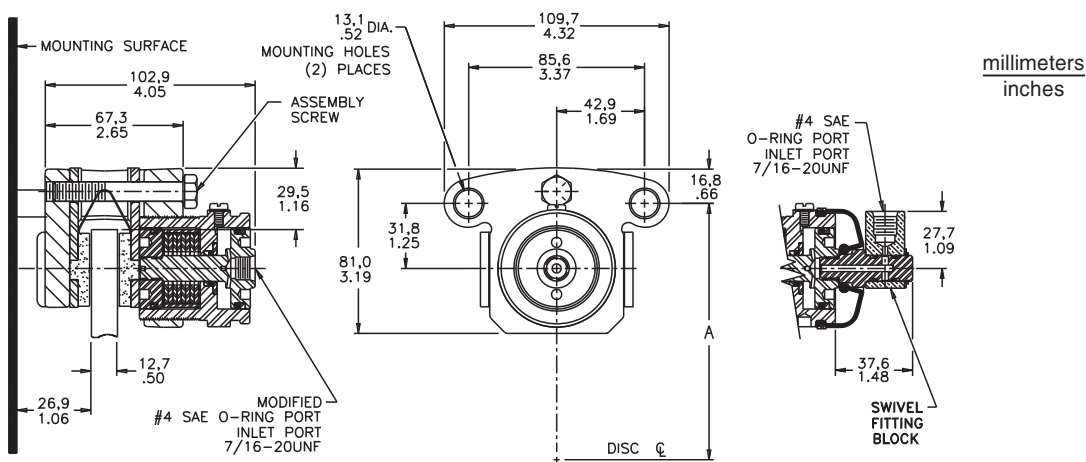
These brakes are designed to operate as parking and/or emergency brakes. If your application requires rapid cycling consult MICO, Incorporated for recommendations.

Consult MICO Applications Department for other models.

See page 5 for disc diameter-vs-brake torque ratio charts.

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 boss
- **Approximate weight:** 4.2 lb

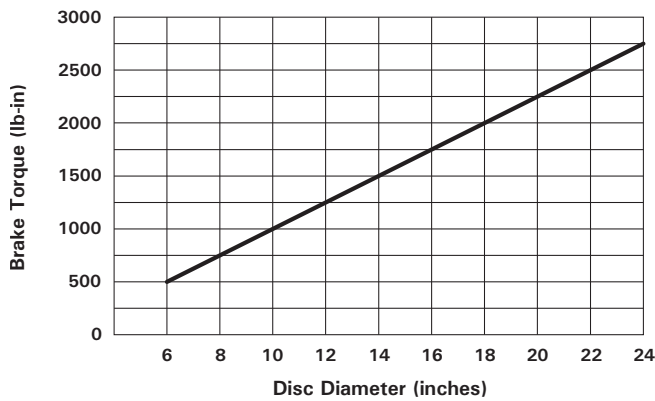


NOTES:

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.

A dimension = Disc Radius + $\frac{9.7}{.38}$

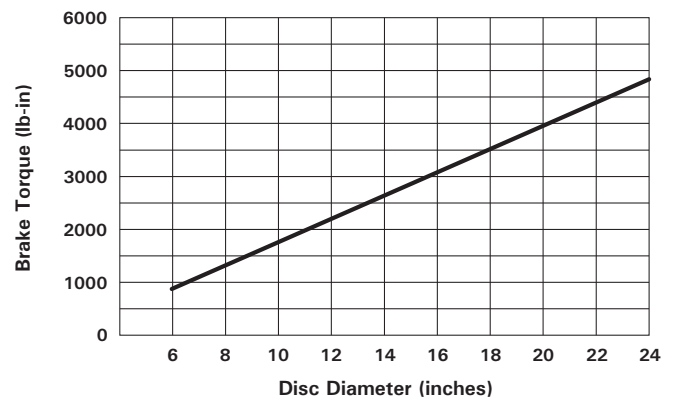
Model: 02-515-002



TORQUE FORMULA (Bt = Brake Torque)

$Bt = 250 \times (\text{Disc Radius} - 1.00)$
Complete Retraction Pressure - 300 PSI

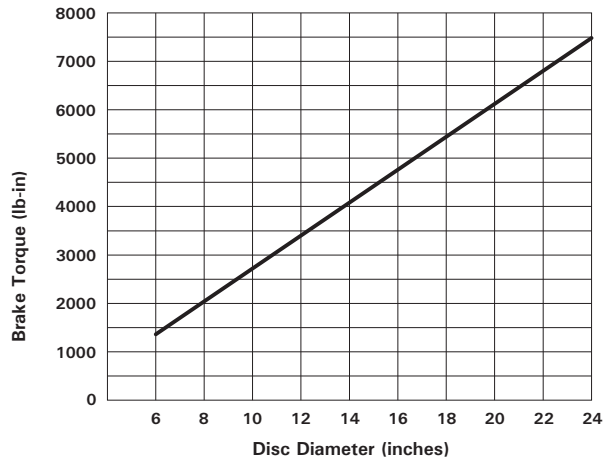
Models: 02-515-004, 03-515-014



TORQUE FORMULA (Bt = Brake Torque)

$Bt = 440 \times (\text{Disc Radius} - 1.00)$
Complete Retraction Pressure - 600 PSI

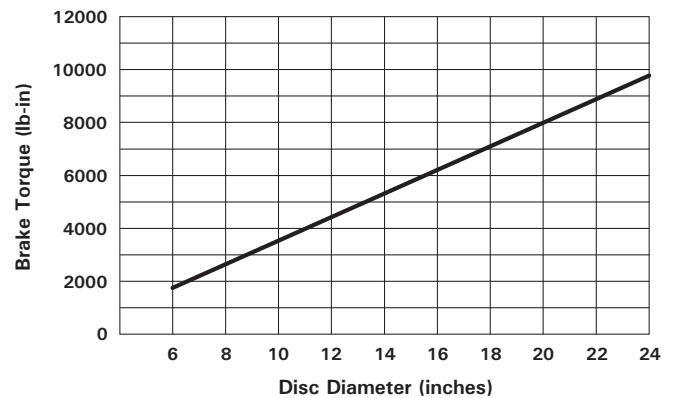
Models: 02-515-012, 03-515-119



TORQUE FORMULA (Bt = Brake Torque)

$Bt = 680 \times (\text{Disc Radius} - 1.00)$
Complete Retraction Pressure - 700 PSI

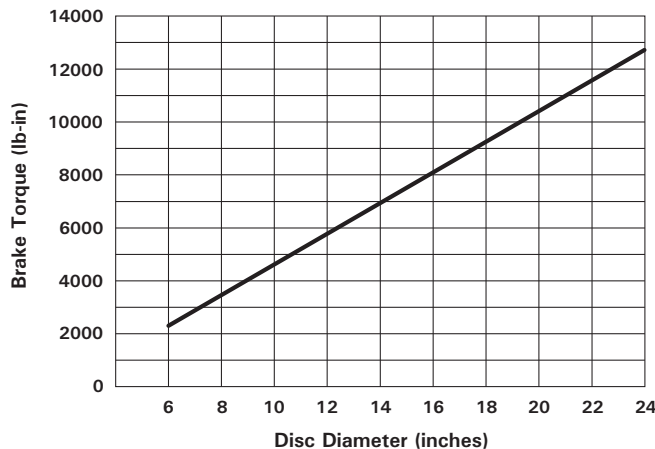
Models: 02-515-008, 02-515-020, 03-515-018



TORQUE FORMULA (Bt = Brake Torque)

$Bt = 900 \times (\text{Disc Radius} - 1.00)$
Complete Retraction Pressure - 1200 PSI

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



TORQUE FORMULA (Bt = Brake Torque)

$Bt = 1150 \times (\text{Disc Radius} - 1.00)$
Complete Retraction Pressure - 1700 PSI

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



515 SERIES CALIPER DISC BRAKE

(Mechanical Apply)

MODEL NUMBERS

02-515-148

02-515-150

SPECIFICATIONS

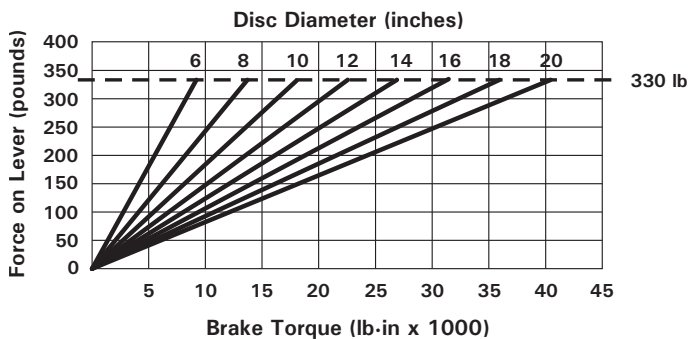
- **Disc range:** 6 inch to unlimited
- **Disc thickness:** 0.50 inch - for other disc thicknesses contact MICO, Inc.
- **Total lining contact area:** 6.36 inch²
- **Caliper material:** ductile iron
- **Caliper finish:** zinc chromate yellow
- **Lining thickness:** 0.22 inch
- **Usable lining thickness:** 0.22 inch
- **Lining material:** non-asbestos, lead free
- **Lever movement:** 40° either direction
- **Lever pull:** limited to 330 lb at hole ②
limited to 420 lb at hole ①
- **Approximate weight:** 4.7 lb

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.

Chart is based on using hole ②

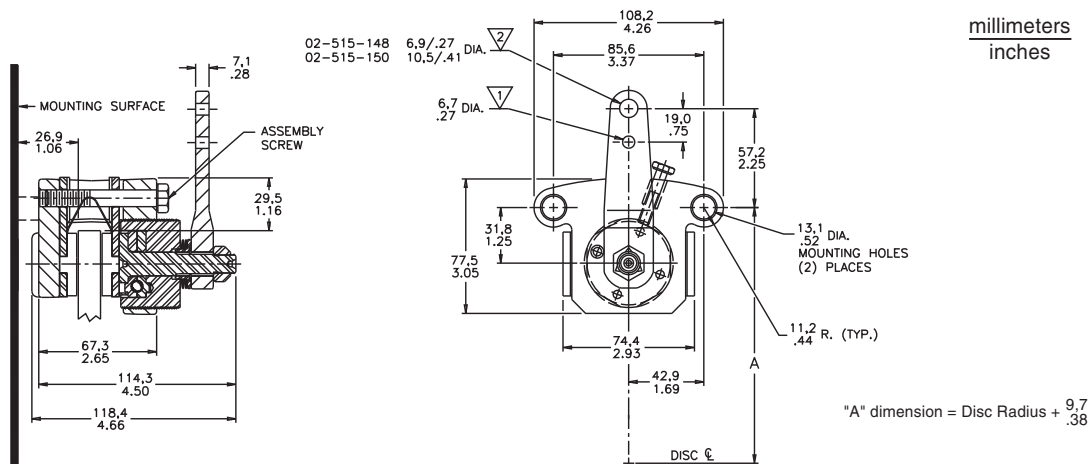


TORQUE FORMULA (Bt = Brake Torque)

$Bt = 10.69 \times \text{Lever Pull} \times (\text{Disc Radius} - 1.00)$ for hole ①

$Bt = 13.61 \times \text{Lever Pull} \times (\text{Disc Radius} - 1.00)$ for hole ②

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





515 SERIES CALIPER DISC BRAKE

(Hydraulic Apply)

MODEL NUMBERS

Brake Fluid
02-515-025

Hydraulic Oil
02-515-030

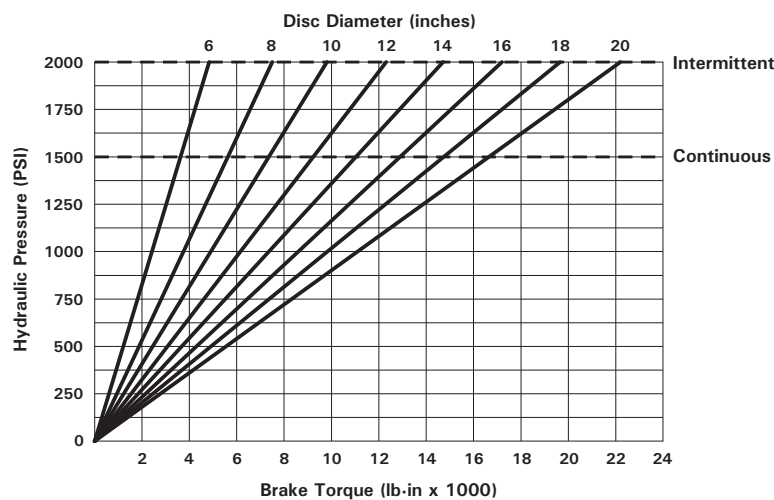
SPECIFICATIONS

- **Disc range:** 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

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.

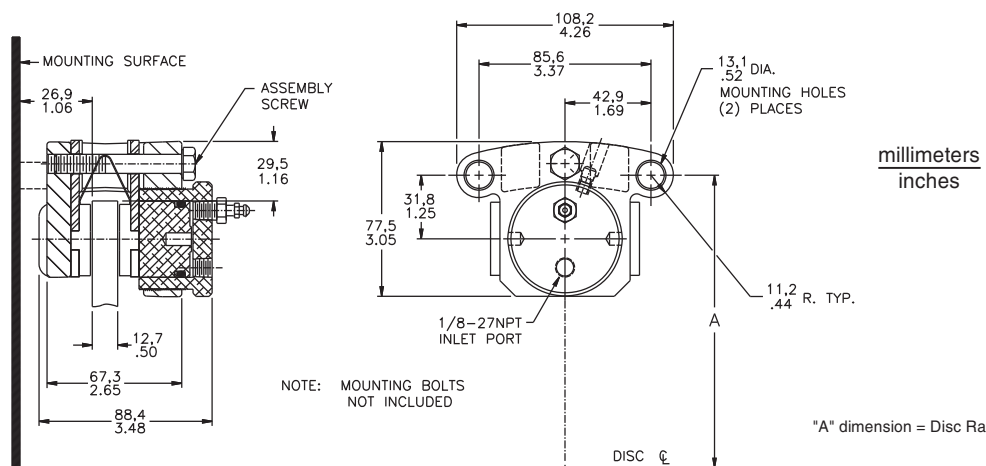
Consult MICO Applications Department for other models.



TORQUE FORMULA (Bt = Brake Torque)

$$Bt = \text{PSI} \times 1.23 \times (\text{Disc Radius} - 1.00)$$

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



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.



520 SERIES CALIPER DISC BRAKE

MODEL NUMBERS

Brake Fluid
02-520-151

Hydraulic Oil
02-520-152

SPECIFICATIONS

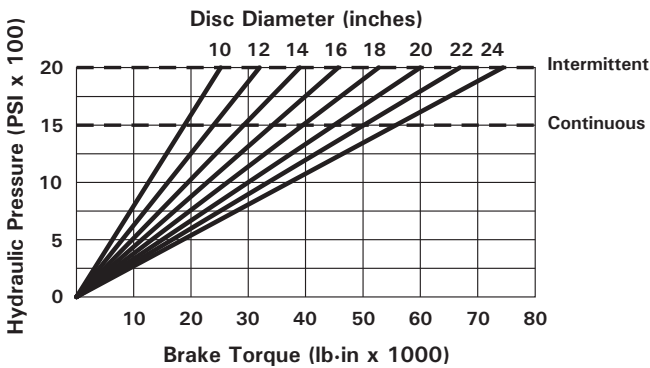
- **Disc range:** 9 inch to unlimited
- **Disc thickness:** 0.25 inch minimum
- **Total lining contact area:** 8.88 inch²
- **Continuous duty pressure:** 1500 PSI
- **Intermittent duty pressure:** 2000 PSI
- **Actuating volume:** 0.30 inch³ nominal
- **Caliper material:** ductile iron
- **Caliper finish:** 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

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.

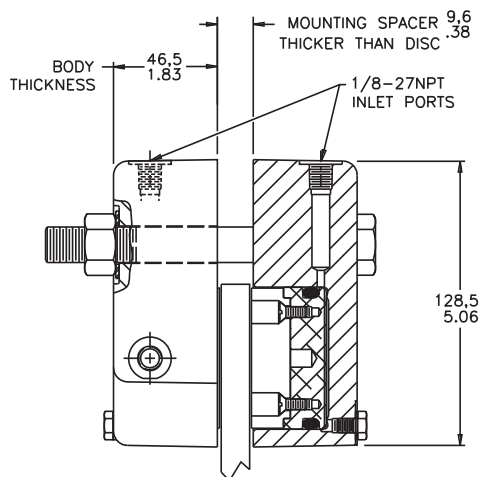
Consult MICO Applications Department for other models.



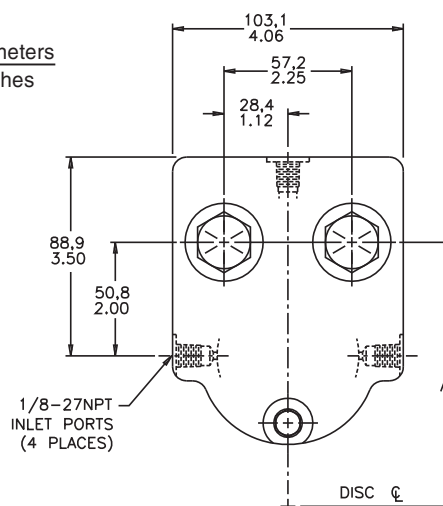
TORQUE FORMULA (Bt = Brake Torque)

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

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



millimeters
inches



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.

$$^{\circ}A^{\circ} \text{ dimension} = \text{Disc Radius} + \frac{16.0}{.63}$$



520 SERIES CALIPER DISC BRAKE

MODEL NUMBERS

Brake Fluid

02-520-201

Hydraulic Oil

02-520-202

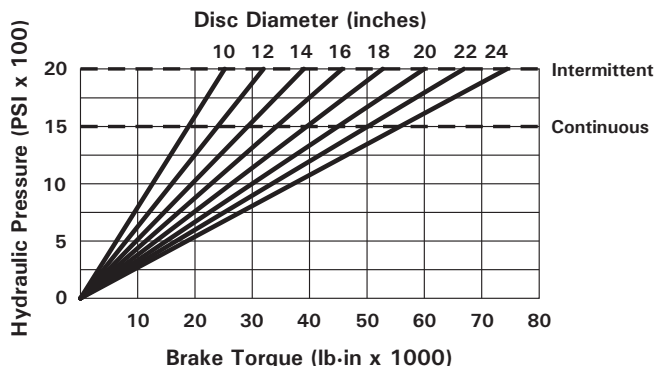
DESCRIPTION

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.



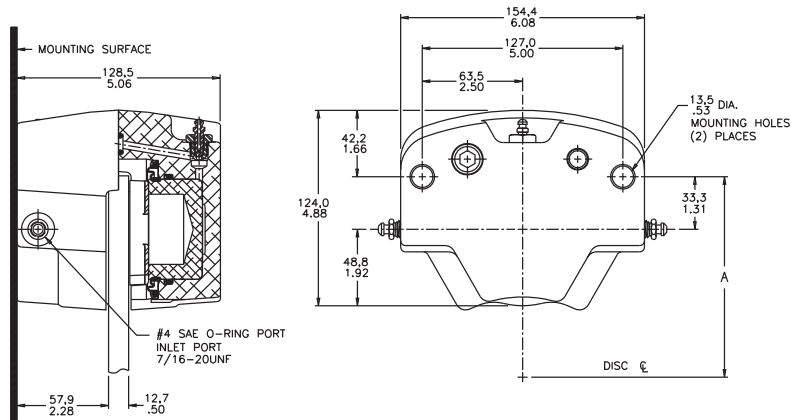
SPECIFICATIONS

- **Disc range:** 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:** anodized - clear
- **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 boss

TORQUE FORMULA (Bt = Brake Torque)

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

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



millimeters
inches

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 + $\frac{3.3}{.13}$ (Disc Diameter greater than 12 to 18 inch)

"A" dimension = Disc Radius + $\frac{4.8}{.19}$ (Disc Diameter greater than 18 to 24 inch)



520 SERIES CALIPER DISC BRAKE

MODEL NUMBERS

Brake Fluid
02-520-261
02-520-265

Hydraulic Oil
02-520-260

SPECIFICATIONS

- **Disc range:** 12 - 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 boss
- **Approximate weight:** 22 lb

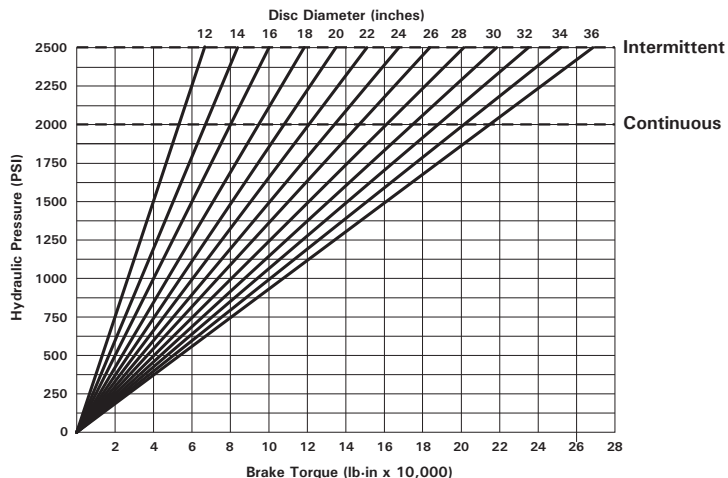
DESCRIPTION

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, Incorporated.

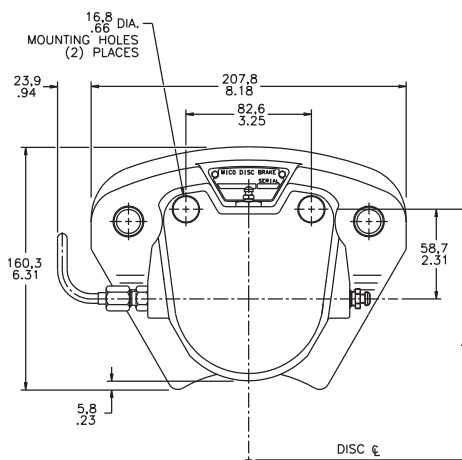
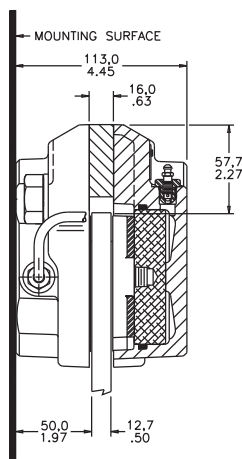
Consult MICO Applications Department for other models.



TORQUE FORMULA (Bt = Brake Torque)

$$Bt = \text{PSI} \times 6.72 \times (\text{Disc Radius} - 2.00)$$

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



millimeters
inches

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.

"A" dimension = Disc Radius + .62



520 SERIES CALIPER DISC BRAKE

MODEL NUMBERS

Brake Fluid

03-520-069

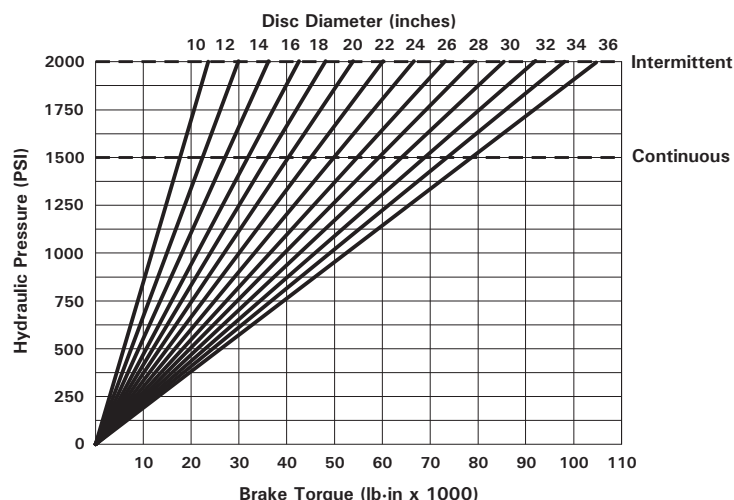
Hydraulic Oil

03-520-072

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.



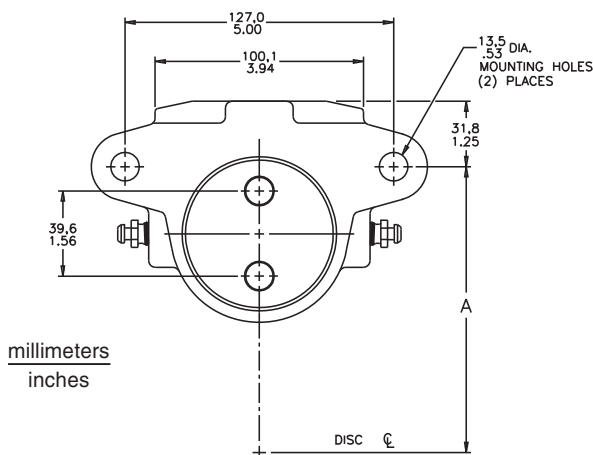
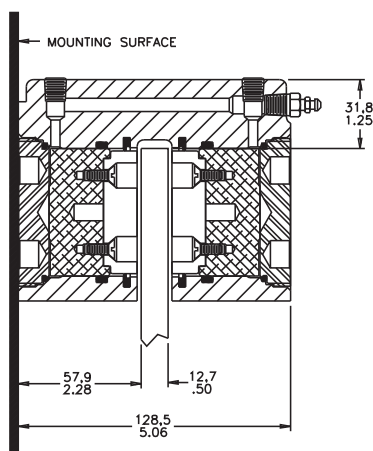
SPECIFICATIONS

- **Disc range:** 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 boss
- **Approximate weight:** 14 lb

TORQUE FORMULA (Bt = Brake Torque)

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

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



NOTES:

1. Model 03-520-069 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



530 SERIES CALIPER DISC BRAKE

(3000 lb)

MODEL NUMBERS

Brake Fluid	Hydraulic Oil
* 01-530-307	* 01-530-306
02-530-307	02-530-306
03-530-307	03-530-306

* No mounting bracket, contact MICO for mounting information.

SPECIFICATIONS

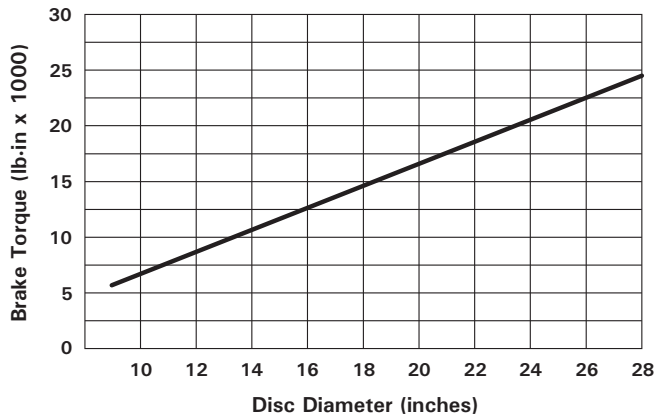
- **Disc range:** 9 inch to unlimited
- **Disc thickness:** 0.31 to 0.50 inch
- **Total lining contact area:** 7.82 inch²
- **Continuous duty pressure:** 2000 PSI
- **Intermittent duty pressure:** 2500 PSI
- **Full retraction volume:** 0.80 inch³ maximum
- **Caliper material:** ductile iron
- **Caliper 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 boss
- **Approximate weight:** 20 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.



MOUNTING STYLES

02-530-306
02-530-307



03-530-306
03-530-307



(See page 13 for dimensions)

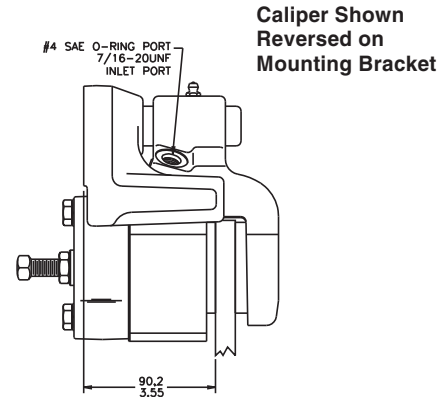
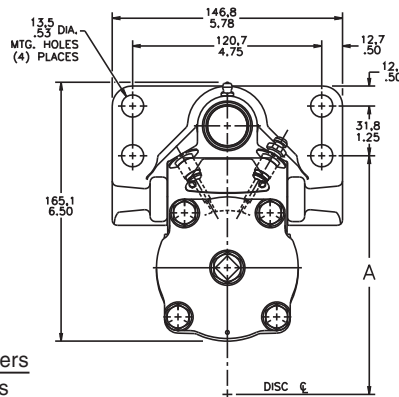
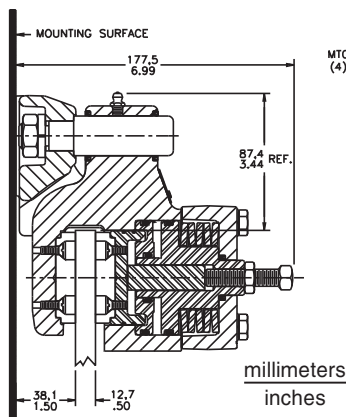
TORQUE FORMULA

(Bt is Brake Torque)

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

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 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

$$^{\circ}A^{\circ} \text{ dimension} = \text{Disc Radius} + \frac{3.1}{.12}$$

RECTANGULAR MOUNT

$$^{\circ}A^{\circ} \text{ dimension} = \text{Disc Radius} + \frac{41.2}{1.62} \quad (\text{For 9 to 15 inch Diameter Discs})$$

$$^{\circ}A^{\circ} \text{ dimension} = \text{Disc Radius} + \frac{44.5}{1.75} \quad (\text{For greater than 15 inch to unlimited Diameter Discs})$$



530 SERIES CALIPER DISC BRAKE

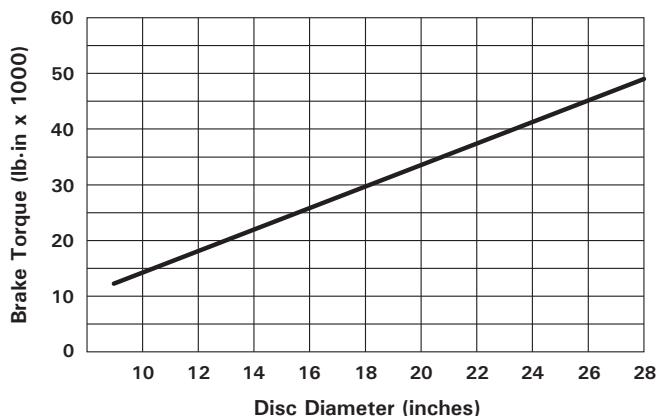
(6000 lb)

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

Brake Fluid

* 01-530-629
02-530-629
03-530-629

Hydraulic Oil

* 01-530-628
02-530-628
03-530-628

* No mounting bracket, contact MICO for mounting information.

SPECIFICATIONS

- **Disc range:** 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 boss
- **Approximate weight:** 20 lb

MOUNTING STYLES

02-530-628
02-530-629

(See page 12 for dimensions)



03-530-628
03-530-629



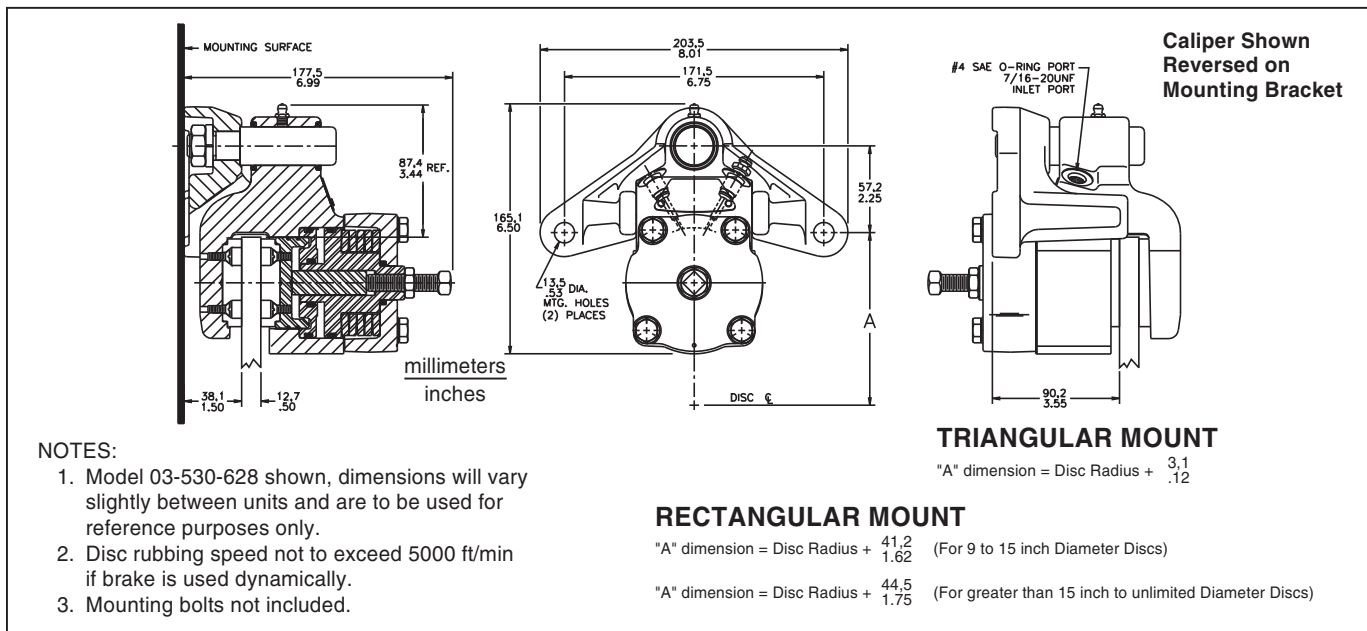
TORQUE FORMULA

(Bt is Brake Torque)

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

Complete Retraction Pressure: 1500 PSI

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





mico

530 SERIES CALIPER DISC BRAKE

(9000 lb)

MODEL NUMBERS

Hydraulic Oil

* 01-530-904

03-530-904

* No mounting bracket, contact MICO for mounting information.

SPECIFICATIONS

- **Disc range:** 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 boss
- **Approximate weight:** 37 lb

TORQUE FORMULA

(Bt = Brake Torque)

Bt (new) = 6225 (Disc Radius - 1.31)

Bt (worn) = 4895 (Disc Radius - 1.31)

Complete Retraction Pressure: 1000 PSI

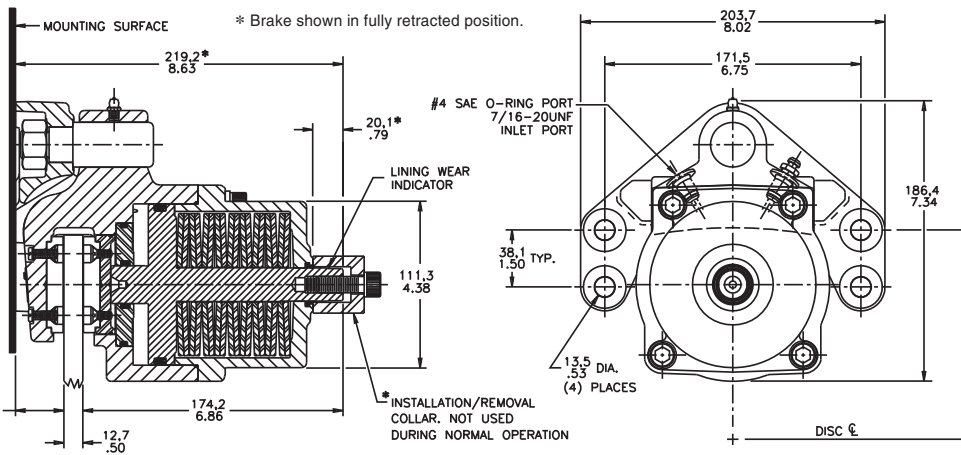
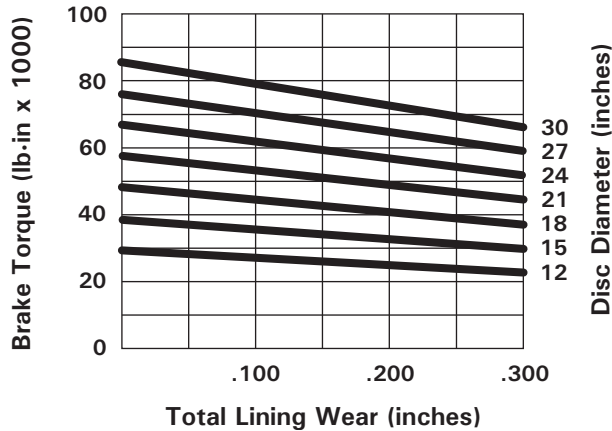
NOTE: Maximum torque achieved only after brake has been properly adjusted and burnished, see Technical Notice (Form No. 81-950-016).

DESCRIPTION

Floating caliper, spring apply, hydraulic release design.

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

Consult MICO Applications Department for other models.



millimeters
inches

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

MODEL NUMBERS

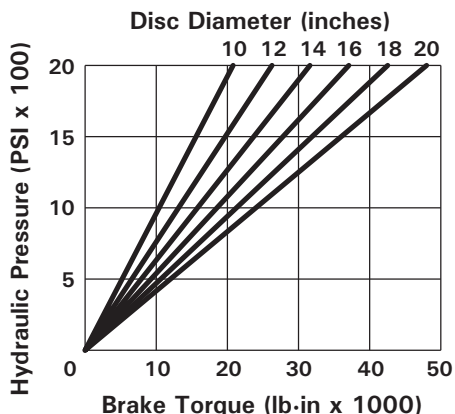
Brake Fluid	Hydraulic Oil
* 01-530-045	* 01-530-040
02-530-045	02-530-040
03-530-045	03-530-040

* No mounting bracket, contact MICO for mounting information.

DESCRIPTION

Floating caliper, hydraulic apply design. Caliper may be reversed on mounting bracket.

Consult MICO Applications Department for other models.



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

SPECIFICATIONS

- **Disc range:** 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 boss
- **Approximate weight:** 16 lb

MOUNTING STYLES

02-530-040
02-530-045



03-530-040
03-530-045



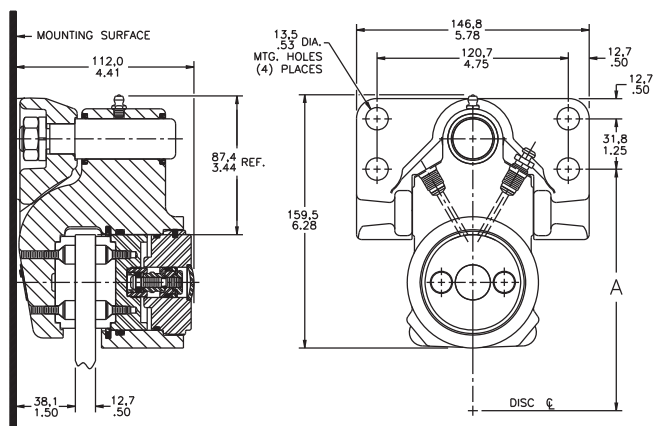
(See page 13 for dimensions.)

TORQUE FORMULA

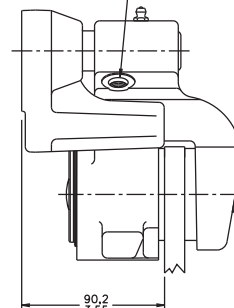
(Bt = Brake Torque)

Bt = PSI x 2.72 x (Disc Radius - 1.18)

millimeters
inches



#4 SAE O-RING PORT
7/16-20UNF
INLET PORT



**Caliper Shown
Reversed on
Mounting Bracket**

NOTES:

1. Model 02-530-045 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.

TRIANGULAR MOUNT

"A" dimension = Disc Radius + $\frac{3.1}{.12}$

RECTANGULAR MOUNT

"A" dimension = Disc Radius + $\frac{41.2}{1.62}$ (For 9 to 15 inch Diameter Discs)

"A" dimension = Disc Radius + $\frac{44.5}{1.75}$ (For greater than 15 inch to unlimited Diameter Discs)

USEFUL FORMULAS

See page 17 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 18.
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, Incorporated 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-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-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/sec²)

d = Deceleration rate (ft/sec²)

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-in)

T = Total torque required (lb-in)

NB = Number of brakes

Torque Required if Gear Reduction is Used

$$Bt = \frac{T}{GR}$$

Where:

Bt = Brake torque required (lb-in)

T = Total torque required (lb-in)

GR = Gear reduction ratio

Kinetic Energy Required to Stop a Moving Vehicle

$$KE = \frac{WV^2}{2g}$$

Where:

KE = Kinetic energy (ft-lb)

W = Gross vehicle weight (lb)

V = Vehicle speed (ft/sec)

g = Acceleration due to gravity (32.2 ft/sec²)

Stationary Equipment Application

Torque Required to Stop a Rotating Mass

$$T = \frac{.039WK^2N}{t}$$

Where:

T = Torque (lb-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-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-in)

hp = Horsepower

N = rpm

CONVERSION FACTORS

TORQUE

lb-ft	lb-in	daN-m	N-m	kg-m
1	12	.13556	1.356	.1382
.08333	1	.01130	.1130	.01152
7.376	88.51	1	10	1.019
.7376	8.851	.1	1	.102
7.2359	86.80	.9806	9.806	1

PRESSURE

PSI	MPa	bar	kPa	kg/mm ²	kg/cm ²
1	.006895	.06895	6.895	.0007031	.07031
145	1	10	1000	.102	10.20
14.50	.1	1	100	.0102	1.02
.145	.001	.01	1	.000102	.0102
1422	9.807	98.07	9807	1	100
14.22	.09807	.9807	98.07	.01	1

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

ft-lb	kgf-m	kW-hr	hp-hr	J
1	.1383	3.766e-7	5.051e-7	1.356
7.233	1	2.724e-6	3.653e-6	9.806
2655224	367098	1	1.341	3600000
1980000	273745	.7457	1	2684520
.7376	.1020	2.778e-7	3.725e-7	1

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

1 BTU = 778.17 ft-lb

VELOCITY

m/sec	ft/sec	km/hr	MPH	ft/min
1	3.281	3.6	2.237	196.85
.3048	1	1.097	.6818	60
.2778	.9113	1	.6214	54.68
.4470	1.467	1.609	1	88
.00508	.01667	.01829	.01136	1

LENGTH

cm	in	ft	m	km	mile
1	.3937	.03281	.01	.00001	.000006
2.54	1	.08333	.0254	.000025	.000017
30.48	12	1	.3048	.0003	.000186
100	39.37	3.281	1	.001	.000621
100,000	39,370	3281	1000	1	.6214
160,934	63,360	5280	1609	1.609	1

VOLUME

in ³	cm ³	L	qt
1	16.39	.01639	.01732
.06102	1	.001	.001057
61.02	1000	1	1.057
57.75	946.4	.9464	1

1 U.S. gallon = 231 in³

1 U.S. gallon = 0.13368 ft³

FLOW

GPM	in ³ /sec	L/min
1	3.850	3.785
.260	1	.983
.264	1.017	1

FORCE

N	lb
1	.2248
4.4482	1

ACCELERATION

ft/sec ²	in/sec ²	m/sec ²	cm/sec ²
1	12	.3048	30.48
.08333	1	.0254	2.54
3.281	39.37	1	100
.03281	3937	.01	1

AREA

in ²	cm ²	mm ²
1	6.452	645.2
.1550	1	100
.001550	.01	1

POWER

hp	kW	met-hp
1	.7457	1.014
1.341	1	1.360
.9863	.7355	1

1 hp = 550 ft-lb/sec

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

PERCENT OF GRADE	θ (DEGREES)	SIN θ
1	0° 34'	0.0100
2	1° 09'	0.0200
3	1° 43'	0.0300
4	2° 17'	0.0400
5	2° 52'	0.0499
6	3° 26'	0.0599
7	4° 00'	0.0698
8	4° 34'	0.0797
9	5° 09'	0.0896
10	5° 43'	0.0995
11	6° 17'	0.1093
12	6° 51'	0.1191
13	7° 24'	0.1289
14	7° 58'	0.1386
15	8° 32'	0.1483
16	9° 05'	0.1580
17	9° 39'	0.1676
18	10° 12'	0.1772

PERCENT OF GRADE	θ (DEGREES)	SIN θ
19	10° 45'	0.1867
20	11° 19'	0.1961
21	11° 52'	0.2055
22	12° 24'	0.2149
23	12° 57'	0.2241
24	13° 30'	0.2334
25	14° 02'	0.2425
26	14° 34'	0.2516
27	15° 07'	0.2607
28	15° 39'	0.2696
29	16° 10'	0.2785
30	16° 42'	0.2873
35	19° 17'	0.3304
40	21° 48'	0.3714
45	24° 14'	0.4104
50	26° 34'	0.4472
55	28° 49'	0.4819
60	30° 58'	0.5145

MICO 520 & 530 Series Caliper Disc Brake Cross Reference

520 Series

Old Model Number	Replaced By	Page	Can Use	Page
02-520-184	02-520-260	10		
02-520-233			02-520-261	10
02-520-238			02-520-260	10
03-520-179	02-520-261	10		
03-520-279	02-520-261	10		
02-520-250	02-520-260	10		
02-520-251	02-520-261	10		
03-520-181	02-520-265	10		

530 Series

Old Model Number	Replaced By	Page	Can Use	Page
01-530-016	01-530-040	15		
01-530-021	01-530-045	15		
*01-530-126			*01-530-306	12
*01-530-128			*01-530-306	12
*01-530-131			*01-530-307	12
*01-530-400			*01-530-628	13
*01-530-401			*01-530-629	13
*01-530-416			*01-530-628	13
*01-530-600	*01-530-628	13		
*01-530-601	*01-530-629	13		
*01-530-616	*01-530-628	13		
02-530-016	02-530-040	15		
02-530-021	02-530-045	15		
02-530-023	02-530-045	15		
02-530-024	02-530-040	15		
02-530-126			02-530-306	12
02-530-128			02-530-306	12
02-530-131			02-530-307	12
02-530-400			02-530-628	13
02-530-401			02-530-629	13
02-530-416			02-530-628	13
02-530-600	02-530-628	13		
02-530-601	02-530-629	13		
02-530-604			02-530-628	13
02-530-616	02-530-628	13		
03-530-016	03-530-040	15		
03-530-021	03-530-045	15		
03-530-024	03-530-040	15		
03-530-126			03-530-306	12
03-530-131			03-530-307	12
03-530-400			03-530-628	13
03-530-401			03-530-629	13
03-530-416			03-530-628	13
03-530-600	03-530-628	13		
03-530-601	03-530-629	13		
03-530-603			03-530-629	13
03-530-604			03-530-628	13
03-530-616	03-530-628	13		
03-530-618			03-530-628	13

* Brake module only. No mounting bracket.

NOTES



Application Data Sheet

Date _____

(for Caliper Disc Brakes)

(confidential)

Name _____ Title _____

Company _____

Address _____ City _____ State _____ Zip _____

Fax _____ Phone _____ Country _____

Email _____

Are you currently working with a MICO Distributor? ☐ Yes ☐ No If yes, which one and who is the contact? _____

Estimated Annual Quantity _____

Is this a military application? ☐ Yes ☐ No If yes, what is the destination country? _____

Is this an underground coal mine application? ☐ Yes ☐ No

VEHICLE SPECIFICATIONS

Type of vehicle or equipment _____ Name & model no. _____

Gross vehicle weight _____ lb Empty vehicle weight _____ lb

Weight distribution loaded: front _____ lb or % loaded rear _____ lb or %

Weight distribution empty: front _____ lb or % empty rear _____ lb or %

Wheelbase: _____ inch Center of gravity (vertical): _____ loaded _____ empty

Rolling radius: front _____ inch rear _____ inch

Maximum loaded speed (level) _____ MPH

Maximum grade in favor of load _____ %

Rate of deceleration desired: Stop in _____ ft from _____ MPH or _____ ft/s²

Coefficient of friction between tire and ground (estimated) _____ Type of road surface _____

Is this application required to conform with recommended practices or standards, if so which ones _____

STATIONARY EQUIPMENT BRAKE REQUIREMENTS

WK² of the rotating parts _____ lb-ft² RPM _____

Rate of deceleration desired: Stop time _____ seconds from _____ RPM or _____ radians/s²

SPECIFICATIONS FOR BOTH MOBILE AND STATIONARY EQUIPMENT

Duty cycle _____

Maximum allowable rotor diameter _____ inch, and thickness _____ inch

Type of Brake Actuation: ☐ Hydraulic ☐ Mechanical ☐ Air ☐ Spring set hydraulic release

Maximum pressure available _____ PSI

System fluid used: ☐ DOT 3 or 4 brake fluid ☐ Mineral base hydraulic oil ☐ Water base ☐ Synthetic base

Fluid manufacturer and brand name _____

Number of brakes per machine _____ Location of brakes: _____

Indicate brake relation within axle to gear train (use diagram):

- ☐ Brake mounted on driveline
- ☐ Brake mounted between differential and planetary ratio
- ☐ Brake wheel end out board of planetary ratio

Drive shaft or wheel hub diameter _____ inch

Desired lining life (number of stops) _____



Continued . . .

Please include any available drawings to show brake location on equipment, space for brake, mounting dimensions and any other pertinent information which you believe would be of assistance to us in understanding your brake application.

You incur no obligation by submitting this data and the information given will be held in strict confidence.

Comments: _____

NOTICE

Component and system recommendations made by MICO, Incorporated are based on information supplied by potential user and/or system designer. The potential user and/or designer must make final acceptance and approval of components and system after testing performance on an actual application for which system was designed.

MICO is a registered trademark of MICO, Incorporated. MICO is registered in the U.S. Patent and Trademark Office as well as in Australia, Canada, Great Britain, Indonesia, Japan, Peoples Republic of China, and South Korea.



Innovative Braking and Controls Worldwide

Form No. 80-950-022

Revised 2008-08-07

MICO, Incorporated

1911 Lee Boulevard / North Mankato, MN U.S.A. 56003-2507

Tel: 507.625.6426 **Fax:** 507.625.3212

www.mico.com

Printed in U.S.A.

MICO has made every attempt to present accurate information in catalogs, brochures, and other printed material. MICO can accept no responsibility for errors from unintentional oversights that may exist. Due to a continuous program of product improvement, both materials and specifications 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 further questions, please call MICO.



Innovative Braking and Controls Worldwide

MICO, Incorporated

1911 Lee Boulevard
North Mankato, MN U.S.A. 56003-2507
Tel: 507.625.6426 **Fax:** 507.625.3212

MICO Europe Ltd.

Goodwood Road / Pershore
Worcestershire Wr10 2RY England
Tel: +44(0) 1386 555 562 **Fax:** +44(0) 1386 553 955

Web Site: www.mico.com

MICO is a registered trademark of MICO, Incorporated. MICO is registered in the U.S. Patent and Trademark Office as well as in Australia, Canada, Great Britain, Indonesia, Japan, Peoples Republic of China, and South Korea.

PRODUCT LINE:

Brakes

Caliper Disc Brakes
Multiple Disc Brakes

Brake Locks

Electric
Mechanical

Controls

Electronic Controls
Hydraulic Throttle Controls
Pedal Controls
Switches
Transducers/Sensors

Cylinders

Drive Axle Brake Actuators
Slave Cylinders
Wheel Cylinders

Master Cylinders

Boosted Cylinders
Hydraulically and Air Actuated
Straight Bore Cylinders
Two-Stage Cylinders

Valves

Accumulator Charging
Electrohydraulic Brake
Park Brake
Pressure Modulating

Miscellaneous Components

In-line Residual Check Valves
Pump with Integrated Valves
Reservoirs