MULTIPLE DISC BRAKES

Posi-torque winch brakes, pressure override brakes, wheel mount brakes, and driveline brakes

Fully enclosed modular brakes for mobile and industrial applications

ZF Off-Highway Solutions Minnesota Inc. designs, manufactures, and markets hydraulic components, controls, and brake systems, primarily for off-highway markets.

Many of the world's largest Off-Highway OEMs value the knowledgeable staff at ZF Off-Highway Solutions Minnesota Inc. 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.

ZF Off-Highway Solutions Minnesota Inc. continuously strives for improvement, while remaining a quality leader in our field. We are a successful, customer driven business. We look forward to working with you!

Spring Apply, Hydraulic Release (SAHR) Multiple Disc Brakes

Safe, sure controlled braking . . . precise control of swing drives or other vehicles and equipment with swivel joints . . . positive load positioning and "run-away" protection for winches . . . virtual elimination of slippage in hydraulic motors . . . These and many other brake related problems have been solved by using a superior, quality built Multiple Disc Brake in the application.

These precisely engineered brakes are totally enclosed units applied by built-in springs and "held-off" by hydraulic pressure. Maximum torque is produced when hydraulic pressure is absent, either intentionally or due to system failure.

Many or our brake designs have features developed specifically to solve problems encountered with other brake designs . . . Such as piston breakage, piston cocking, spring, spline or bearing failure and low torque and high torque pressure drag.

The catalog coding in this catalog describes mounting, shaft, torque and available options. The catalog code system offers considerable versatility and flexibility, enabling you to select the product for your specific application.

Complete the appropriate Application Data Sheet online, www.mico.com, and submit to sh-applications.NMN@ZF.com. The ZF Off-highway Solutions Minnesota Inc. Applications Department will analyze your specifications and based on your input recommend an multiple dics brake suitable for your requirements.

Minimum quantity orders apply to some brake combinations. Not all possible brake combinations are currently in production.

Edition 1

Version 1 (05.2023)

84-500-001 (en)

Catalog Index

*** Pressure Override Brakes provide secondary actuation when used for service braking.**

**** May be ordered with optional pressure override feature.**

Applications

Swing Drive Equipment

Forestry Equipment

Agricultural Equipment

Heavy Construction Equipment

Mining Equipment

In-Plant & Warehouse Equipment

Airport Support Vehicles

Representation and Service

In addition to the numerous design improvements over competitor models, you also get ZF Off-Highway representation and service which is second to none.

Simplified Disassembly and Assembly

Features such as inboard oil seal, one piece piston separators, longer torque pins and modular design concepts on many models help to simplify disassembly and assembly procedures.

Large Diameter Discs

Larger disc diameters on many models give ZF Off-Highway Brakes higher torque, better heat dissipation and fewer operating parts.

Extensive Testing

Testing on ZF Off-Highway Multiple Disc Brakes include high pressure cycle, temperature, horizontal and vertical mount heat generation, spring life and performance, static torque, dynamic torque, and leak testing.

Compact Modular Designs

Compact modular designs reduce problems encountered in many installations. Most models can be installed into restricted space with little or no additional adjustment, alignment or special brackets.

ZF Advantage

Interchangeable with Other Fail-safe Type Brakes

ZF Multiple Disc Brakes are interchangeable with other fail-safe type brakes using SAE and industry standards as a guide. In most cases engineering changes are not required, therefore, these brakes are economical to use.

Unique Balanced Piston Design

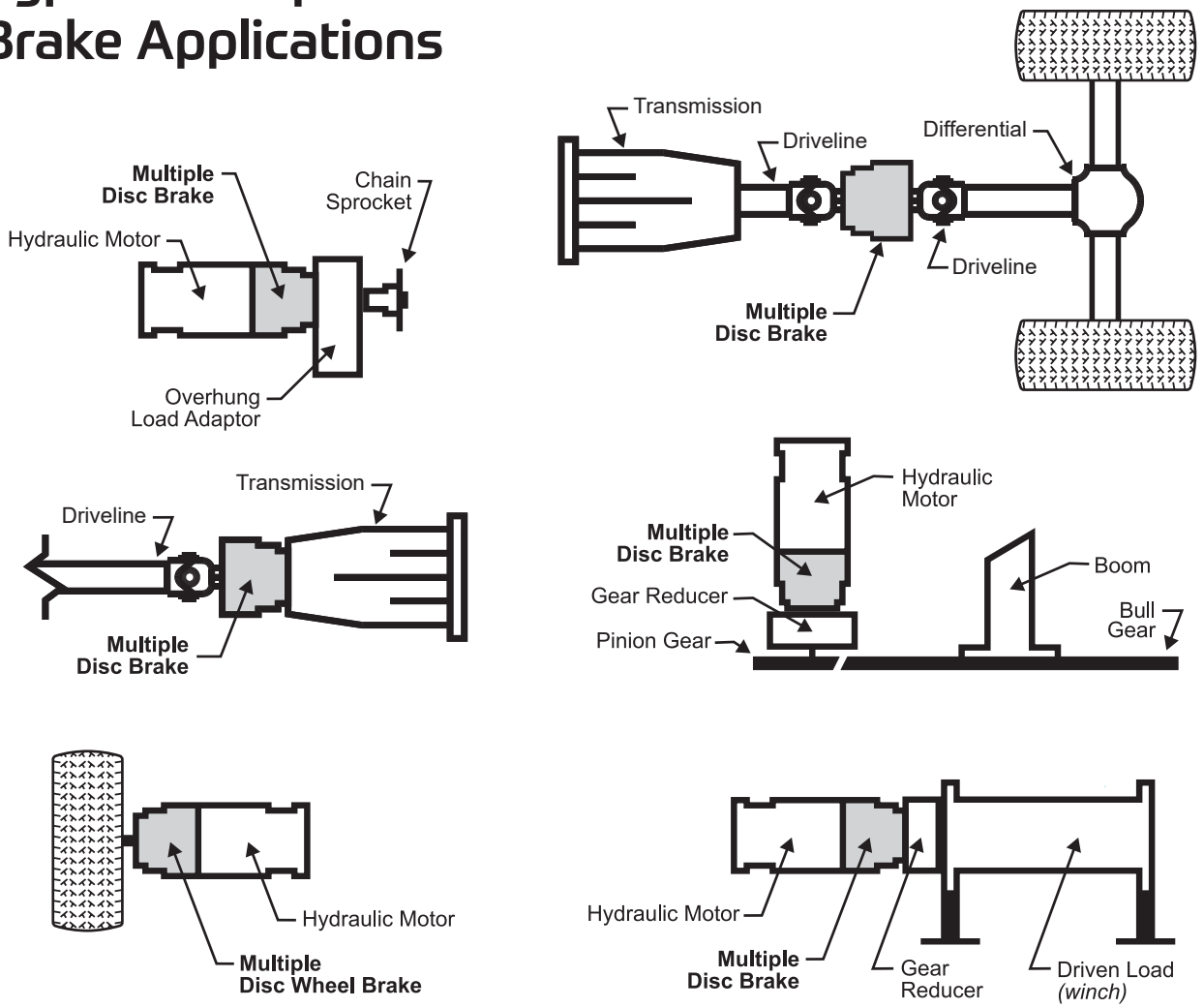
Some models feature a piston design that virtually eliminates areas of localized stress by more uniformly distributing the pressure generated load.

Multiple Disc Brakes
(spring apply, hydraulic release)

Our engineers are innovators in the design of spring apply, hydraulic release multiple disc brakes, wheel brakes, closed-output motor brakes, posi-torque winch brakes and more. The engineers are committed to improving the product while reducing cost. Simple, straight forward designs result in rugged brake products. These products require less maintenance because they are designed with fewer moving parts. They are truly superior in reliability and performance.

ZF Multiple Disc Brakes are designed for use with heavy-duty machinery and off-highway vehicles in the construction, material handling, agriculture, mining, sanitation, utilities, and timber industries. They are also used in a multitude of winching applications. Brakes of this type reduce maintenance and downtime by preventing contaminants, which cause brake lining wear, from entering the brake. They will provide consistent braking torque, positive hold, and long life in rugged environments.

Typical Multiple Disc Brake Applications



Catalog Code Explanation

The catalog code numbering system allows you to construct the brake by combining the variables that meet your needs. **Catalog code number example:** 3A-060618-M.

A production number will be assigned by our Engineering Department upon receipt of your order.

NOTE

For brake combinations that are not currently established, but possible, quotation and assignment of part number must be predicated by receipt, review, and acceptance of applicable multiple disc brake data sheet.

Options Explanation

Z = OIL COOLED OPTION, allows flow-through or sump oil cooling for brakes which may be required to handle limited dynamic inputs. Wet brakes are also used in applications where the package is exposed to severe duty or to adverse environmental conditions such as marine winches or mining vehicles. Products that are to be used strictly wet are noted as such. Oils containing slippery or antiwear additives, such as graphite or molybdenum disulfide or extreme pressure (EP) type lubricants, may allow the brake to slip at torque levels below the rated values and should be avoided.

Specifications (Modular Design)

- Flow through - 3.8 L/min (1.0 GPM) to a maximum of 26.5 L/min (7.0 GPM)
- Case pressure should not exceed 1.03 bar (15 PSI)
- Inlet ports - SAE No. 6, 9/16-18 o-ring boss
- Outlet ports - SAE No. 6, 9/16-18 o-ring boss
- Brakes are shipped dry and the customer is responsible for adding proper type and volume of cooling oil
- Contact ZF Off-Highway Solutions Minnesota Inc. for specific model information such as inlet/outlet port locations and sump oil fluid volume.

P = PRESSURE OVERRIDE OPTION, allows the brake to be used for limited service braking. The pressure override function is operational when the brake is in the retracted postition, where hydraulic pressure is at full release presssure. Due to the brakes inability to dissipate heat, the pressure override feature is normally constrained to providing limited service braking for applications with less than 1000 RPM.

S = SPEED SENSOR OPTION, allows a customer supplied magnetic pickup to simply screw into the brake housing. The magnetic pickup generates an output frequency that is proportional to the rotational speed of the brake shaft.

Specifications

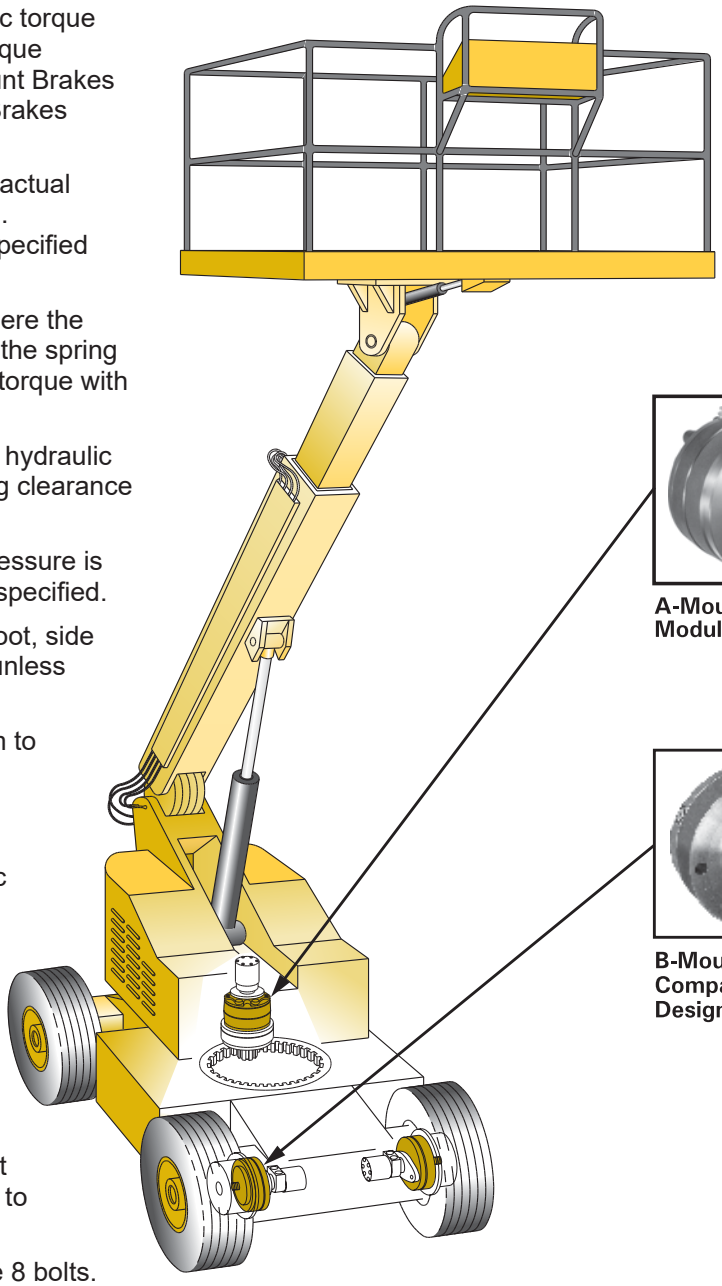
- Direct mounting of Flow-Tech or Motorola[å] Tach Drive Pickup (customer supplied)
- Speed sensing range 0 - 4000 RPM
- Speed sensor ports are 3/8-18 straight thread or 3/4-16UNF (other sizes available upon request, consult ZF Off-Highway Solutions Minnesota Inc.)
- Available number of notched teeth on speed sensor pickup rotor:
  C-Mount Modular: 11, 15, 18, 40, 55 and 70 teeth
  B-Mount Narrow: 40 and 70 teeth
- Contact ZF Off-Highway Solutions Minnesota Inc for specific model information such as speed sensor port locations

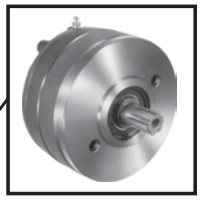
D = DOUBLE BEARING OPTION, is recommended only for special applications. In applications involving overhung loads, such as a sprocket or drum, a double bearing brake usually lacks the load capacity required. In these instances the use of a load adaptor is recommended.

V = VITON® (or equivalent fluorocarbon) SEALS, can be used in applications where standard (nitrile) o-rings and seals are incompatible.

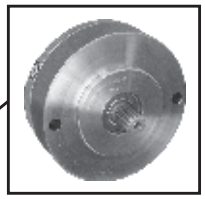
General Brake Information

1. **Brake torque** values listed are dry static torque ratings except for the C-Mount Posi-Torque Brakes (page 26), Compact Wheel Mount Brakes (page 36), and Driveline Multiple Disc Brakes (pages 40-45).
   a. For brakes with Z option (oil-cooled) actual torque is 67% of the dry torque listed.
   b. Static torque may vary ± 10% from specified values.
2. **Initial release pressure** is the point where the amount of hydraulic pressure to relieve the spring force on the rotor stack has zero brake torque with no running clearance.
3. **Full release pressure** is the amount of hydraulic pressure required to achieve full running clearance of the rotor stack.
4. Maximum continuous hydraulic input pressure is 206.8 bar (3000 PSI) unless otherwise specified.
5. All splined shafts are 30° involute, flat root, side fit per ANSI B92.1-1970 specifications unless otherwise specified.
6. All mounting flange dimensions conform to SAE Standard J744 unless otherwise specified.
7. Standard (nitrile) o-rings and seals are compatible with mineral based hydraulic fluids. For applications with non-mineral based fluids or extreme temperatures, other o-ring materials are available.
8. Brakes include mounting face gaskets and/or o-rings. Some motors and gear-boxes allow for the use of o-rings to seal the mounting faces on either side of the brake. Do not use the o-ring and face gasket together to seal a mounting face.
9. When mounting a brake use SAE grade 8 bolts. Tighten to appropriate torque specifications for grade used. Make sure the compression load in the joint does not cause the material under the bolt to yield. Hardened flat washers may be needed.





A-Mount Modular Brake



B-Mount Compact Design Brake

⚠ CAUTION

A. If hydrostatic bench testing is performed on a brake assembly, release pressure must not exceed 68.9 bar (1000 PSI) unless additional mounting bolts are used for supplemental clamping.

B. Pressures above 206.8 bar (3000 PSI) caused by spikes in the hydraulic system can shorten brake life and must be avoided.

C. Most brakes are designed for limited side load capability at output end. Use of an overhung load adaptor is recommended for most applications. Contact ZF Off-Highway Solutions Minnesota Inc. for further information.

Multiple Disc Brakes Modular Design

Cover, Spring Plate and Pressure Plate constructed of heavy duty ductile iron.

Powerful Chrome Silicon Die Springs automatically apply the brake's disc packs when hydraulic pressure drops.

Balanced Piston Design virtually eliminates areas of localized stress by uniformly distributing the pressure generated load.

Features

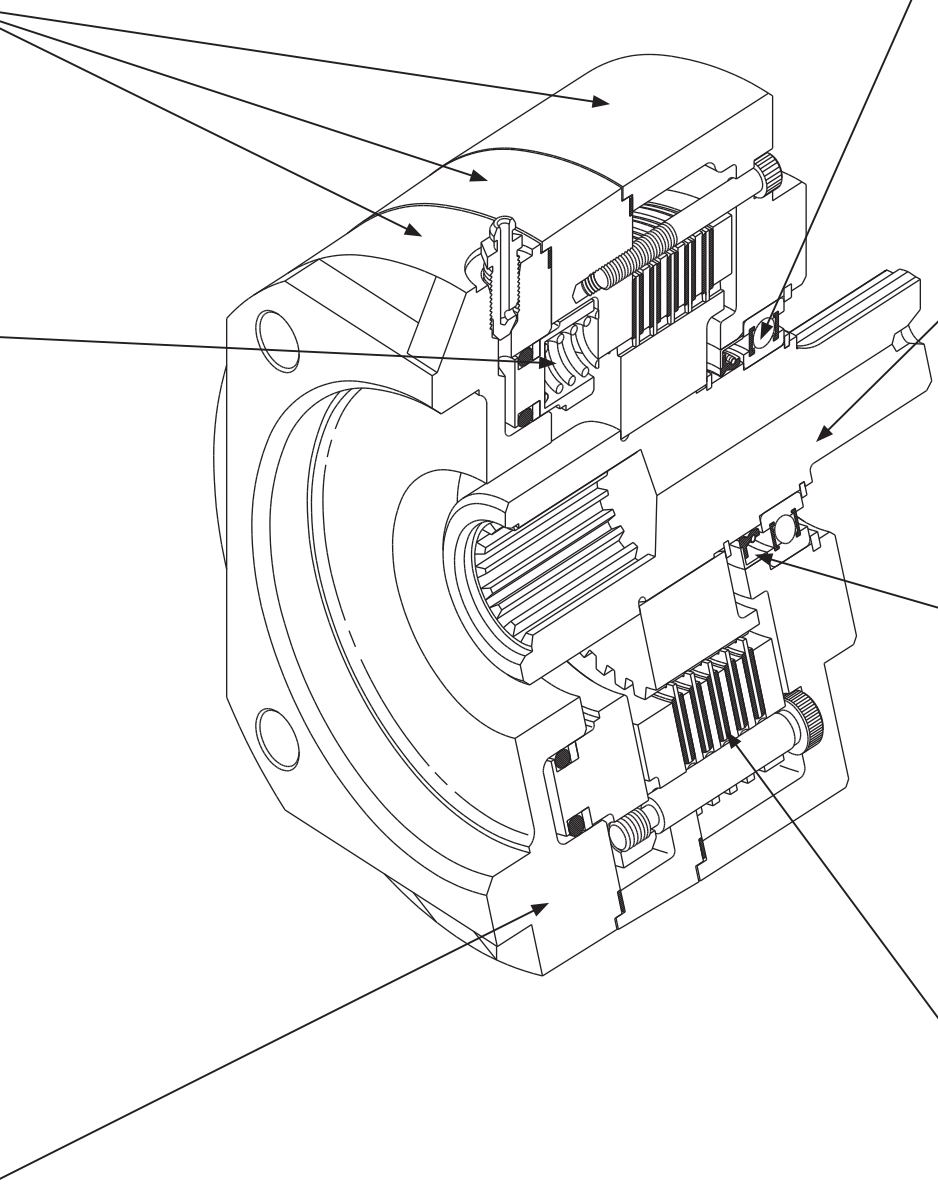
- Large diameter spline shafts virtually eliminate spline battering
- Versatile modular design
- Spring loaded, hydraulically released
- Sealed environment - isolation from contaminants
- Nitrile case seals
- High strength ductile iron construction
- Standard SAE mounting flanges

Benefits

- Eliminates problems found in competitive brake designs, such as piston breakage, piston cocking, spring failure, bearing failure and low and high torque pressure drag
- Designed primarily for use on hydraulic drive systems, can replace most fail-safe type brakes in use today, and do it economically
- Engineering changes to replace fail-safe designs are not required in most cases

Operation

ZF Modular Multiple Disc Brakes are spring apply, hydraulic release brakes. Powerful chrome-silicon die springs automatically apply the brake’s disc pack when hydraulic pressure drops, giving safe, sure braking.



Increased Bearing Support improves shaft alignment between motor, brake and driven load.

Spline Shafts are constructed of high quality, heat treated 8620 steel for high strength and long life. Larger pitch diameter splines for shaft to disc interface give, in many cases, a seven to one advantage in strength. Improved lower tooth loading helps to eliminate spline battering.

Inboard Oil Seal allows for gear box lubrication of the bearing.

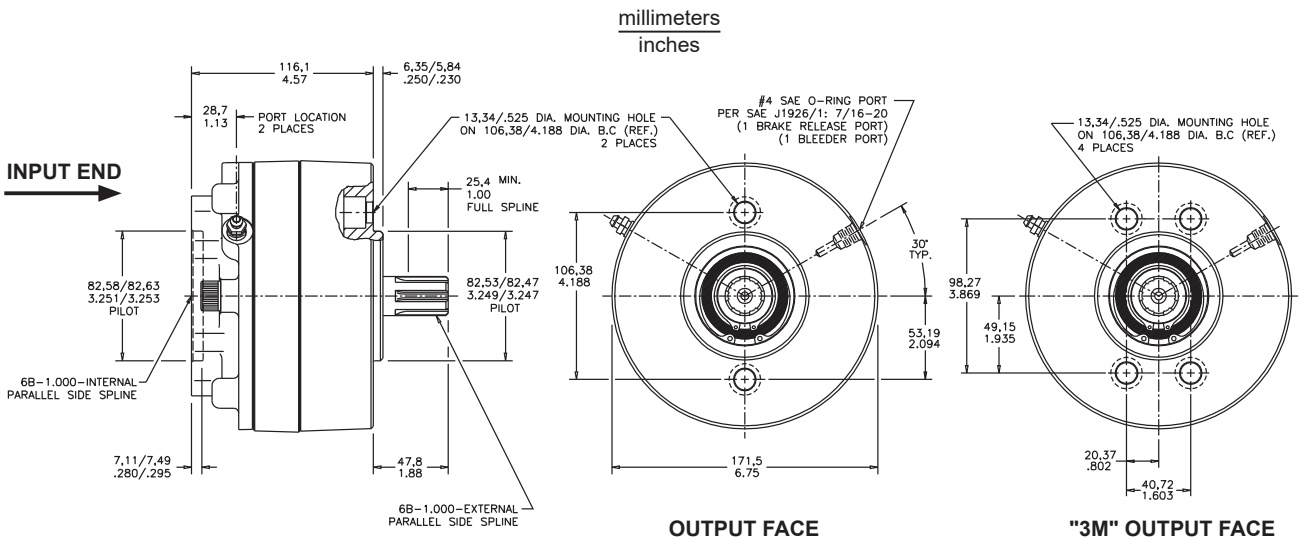
Friction Discs use sintered metallic linings and 1035-1050 steel core material for long life. Large disc diameters are possible because the balanced piston design has the actuating spring and piston all on one side. Location of the torque and tension pins also permits use of the larger discs. With a greater mean radius, the Modular Brake develops more retarding torque, better heat dissipation and requires fewer parts than comparably sized units. Thinner rotor material is possible with larger spline shafts.

A-Mount Brakes, Modular Design

FEATURES

- Low release pressures - ideal for use with closed-loop hydrostatic systems
- Rugged heavy-duty construction with torques to 1017 N·m (9000 lb·in)
- Heat treated 8620 steel shafts for high strength and long life
- Unique balanced piston design

13-538-008
(3A-060640-M)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . . 203 - 1017 N·m (1800 - 9000 lb·in)
Release pressure range . . . . . 8.3 - 26.9 bar (120 - 390 PSI)
Maximum operating pressure . . . . . 206.8 bar (3000 PSI)
Maximum energy input . . . . . 216,960 joule (160,000 ft·lb) (one stop, no damage)
Volume of oil to release brake . . . . . 8.2 cm^3 (0.5 in^3)
Maximum operating temperature. . . . . 132 °C (270 °F)
Maximum speed . . . . . 4000 RPM
Approximate weight. . . . . 11 kg (24 lb)
Fluid type. . . . . Mineral base hydraulic oil

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.
NOTE: Dry design only, not for wet applications.

OUTPUT FACE

3A - SAE A-Mount 2-Bolt
3M - 4-Bolt A-Mount

OUTPUT SPLINE / INPUT SPLINE

06/06
10/10
14/14
25/25

SAE Designation
06 = 25.4 mm (1.00 in) Diameter 6B
10 = 25.4 mm (1.00 In) Diameter Keyed
14 = 14T 12/24
25 = 31.8 mm (1.25 in) Diameter Keyed

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

OPTIONS

(Available separately or in combination)
D - Double Bearing
S - Speed Sensor

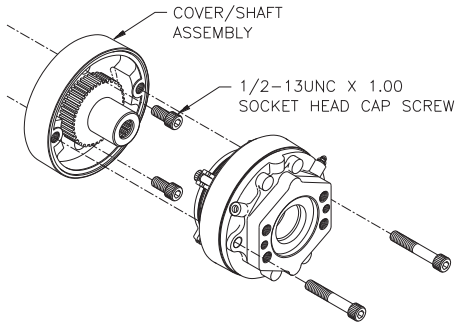
INPUT FACE

M - 4-Bolt and SAE A-Mount 2-Bolt

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
90 *	1017	(9000)	22.8	(330)	26.9	(390)
70 *	791	(7000)	17.2	(250)	20.7	(300)
56 *	633	(5600)	14.5	(210)	17.2	(250)
48 *	542	(4800)	11.7	(170)	13.8	(200)
40	452	(4000) †	14.5	(210)	17.2	(250)
39	441	(3900)	10.3	(150)	12.4	(180)
35	396	(3500) †	11.7	(170)	13.8	(200)
34	384	(3400)	9.0	(130)	10.3	(150)
29	328	(2900) †	10.3	(150)	12.4	(180)
25	283	(2500) †	9.0	(130)	10.3	(150)
24	271	(2400)	6.9	(100)	8.3	(120)
18	203	(1800) †	6.9	(100)	8.3	(120)
11	1243	(11,000)	26.9	(390)	32.4	(470)

* For use with input and output spline codes 14 and 25 only.
† Models available with speed sensor port. Other torques and/or release pressures are available upon request.



Mounting Instructions

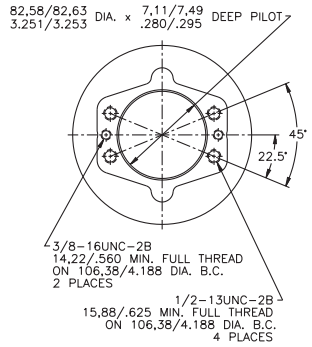
Install cover/shaft assembly on gearbox using either two or four 1/2-13UNC x 1.00 inch long socket head cap screws (not included), depending on brake model being used. See Mounting Instructions included with each brake (Form No. 81-538-002).

ASSIGNED NUMBERS

CATALOG CODE	MODEL NUMBER
3A-060618-M	13-538-004
3A-060624-M	13-538-052
3A-060625-M	13-538-230
3A-060629-M	13-538-054
3A-060635-M	13-538-006
3A-060639-M	13-538-058
3A-060640-M	13-538-008
3A-060656-M	13-538-232
3A-100625-M	13-538-294
3A-100640-M	13-538-044
3A-101018-M	13-538-010
3A-101025-M	13-538-196
3A-101029-M	13-538-024
3A-101035-M	13-538-026
3A-101040-M	13-538-012
3A-141418-M	13-538-016
3A-141424-M	13-538-036
3A-141435-M	13-538-384

CATALOG CODE	MODEL NUMBER
3A-141439-M	13-538-050
3A-141448-M	13-538-300
3A-141456-M	13-538-056
3A-141470-M	13-538-290
3A-141490-M	13-538-320
3A-141490-MD	13-538-034
3A-252518-M	13-538-178
3A-252524-M	13-538-376
3A-252525-M	13-538-022
3A-252529-M	13-538-274
3A-252535-M	13-538-370
3A-252540-M	13-538-242
3A-252548-M	13-538-272
3A-252556-M	13-538-028
3A-252590-M	13-538-060
3M-060625-M	13-538-244
3M-060640-M	13-538-064
3M-101040-M	13-538-040

Input Face



M - 4-Bolt and SAE A-Mount 2-Bolt

CATALOG CODE	MODEL NUMBER
3M-141411-M	13-538-390
3M-141440-M	13-538-020
3M-141440-MD	13-538-032
3M-141448-M	13-538-046
3M-141456-M	13-538-234
3M-141470-M	13-538-236
3M-141470-MD	13-538-202
3M-141490-M	13-538-038
3M-252529-M	13-538-318

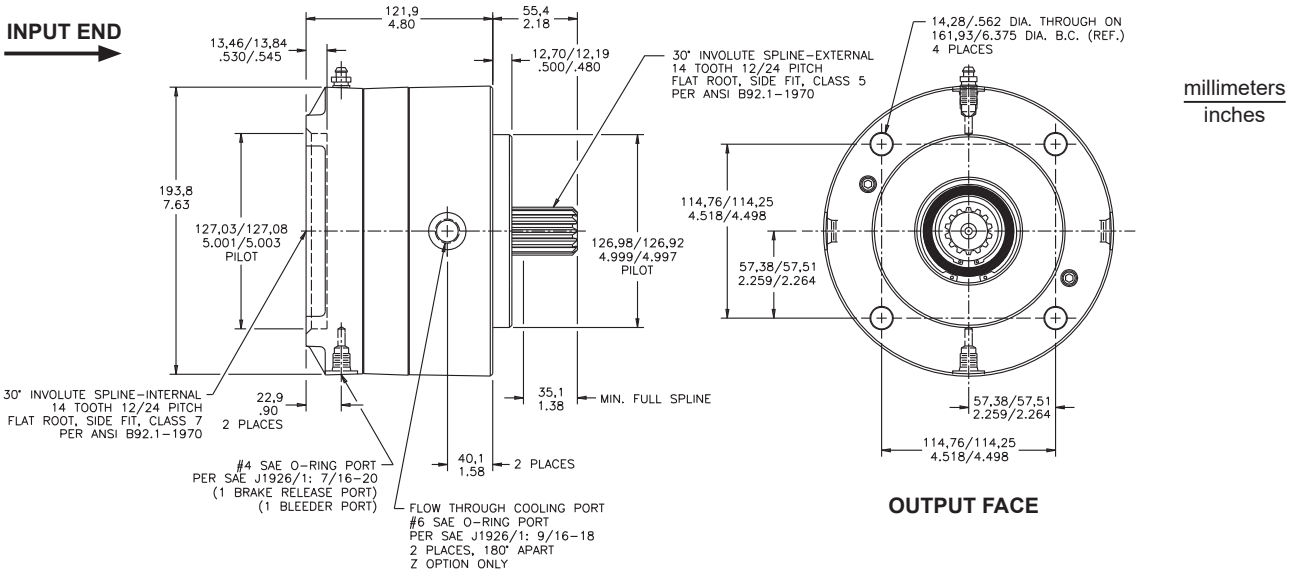
CATALOG CODE	MODEL NUMBER
3M-252535-M	13-538-182
3M-252540-M	13-538-042
3M-252556-M	13-538-382
3M-252590-M	13-538-048

C-Mount Brakes, Modular Design

FEATURES

- More retarding torque than competitive models
- Numerous mounting configurations available
- Low release pressures, ideal for use with closed-loop hydrostatic systems
- Rugged heavy-duty construction
- Heat treated 8620 steel shafts for high strength and long life
- Compact modular package simplifies mounting
- Unique balanced piston design

13-547-078
(3C-141455-CZ)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . . 509 - 1356 N·m (2200 - 12,000 lb·in)
Release pressure range . . . . . 10.3 - 21.4 bar (150 - 310 PSI)
Maximum operating pressure . . . . . 206.8 bar (3000 PSI)
Maximum speed . . . . . 4000 RPM
Volume of oil to release brake . . . . . 16.4 cm^3 (1.0 in^3)
Maximum operating temperature. . . . . 132 °C (270 °F)
Maximum energy input . . . . . 542,400 joule (400,000 ft·lb) (one stop, no damage)
Approximate weight. . . . . 18 kg (40 lb)
Fluid type. . . . . Mineral base hydraulic oil

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.
NOTE: On oil cooled models (Z option) actual torque is 67% of value shown on torque code chart. Recommended sump oil fluid volume when mounted: Horizontal - 118.3 mL (4 oz), Vertical - Contact ZF Off-Highway.

OUTPUT FACE

3C - SAE C-Mount 4-Bolt

OUTPUT SPLINE / INPUT SPLINE

04/00
04/14
13/00
14/00
14/06
14/13
14/14
14/17
17/14
17/17
21/00
21/21
25/14

SAE Designation
00 = Used with "R" input face only
04 = 14T 12/24 (internal)
06 = 25.4 mm (1.00 in) Diameter 6B
13 = 13T 8/16
13 = 13T 16/32
14 = 14T 12/24
17 = 17T 12/24
21 = 21T 16/32
25 = 31.6 mm (1.25 in) Diameter Keyed

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

OPTIONS

(Available separately or in combination)
D - Double Bearing
S - Speed Sensor
V - Fluorocarbon seals
Z - Oil Cooled - see note above

INPUT FACE

B - SAE B-Mount 2-Bolt
C - SAE C-Mount 4-Bolt
C2 - SAE C-Mount 2-Bolt Through
C24 - 2-Bolt and 4-Bolt C-Mount
D - SAE D-Mount
K4 - Eaton Standard 4000
M - 4-Bolt and SAE A-Mount 2-Bolt
R - Closed

See page 46 for Input Face Dimensions.

TORQUE

Code	Torque Rating N·m	(lb·in)	Initial Release Pressure bar	(PSI)	Full Release Pressure bar	(PSI)
98	1107	(9800)	14.5	(210)	20.0	(290)
85	960	(8500)	11.0	(160)	15.2	(220)
80	904	(8000)	12.4	(180)	17.2	(250)
70	791	(7000)	11.0	(160)	14.5	(210)
66	746	(6600)	9.0	(130)	12.4	(180)
55	622	(5500)	9.0	(130)	11.7	(170)
54	610	(5400)	7.6	(110)	11.0	(160)
45	508	(4500)	7.6	(110)	10.3	(150)
30	339	(3000)	4.1	(60)	6.2	(90)
28	316	(2800)	4.1	(60)	6.2	(90)
25	283	(2500)	6.9	(100)	9.0	(130)
24	271	(2400)	5.5	(80)	7.6	(110)
22	249	(2200)	2.8	(40)	4.1	(60)
16	1808	(16,000)	19.3	(280)	28.3	(410)
12	1356	(12,000)	14.5	(210)	21.4	(310)
10	1130	(10,000)	12.4	(180)	17.2	(250)

Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

CATALOG CODE	MODEL NUMBER
3C-040080-RZ	13-547-532
3C-041412-C	13-547-282
3C-041445-C	13-547-454
3C-041445-C2D	13-547-502
3C-041498-C	13-547-324
3C-130016-RZ	13-547-530
3C-140012-R	13-547-272
3C-140012-RZ	13-547-420
3C-140016-RZ	13-547-510
3C-140098-R	13-547-268
3C-140612-MZ	13-547-370
3C-140628-M	13-547-002
3C-140645-M	13-547-264
3C-140655-M	13-547-232
3C-140655-MZ	13-547-006
3C-140685-M	13-547-246
3C-140698-M	13-547-190
3C-141316-B	13-547-540
3C-141324-B	13-547-252
3C-141328-B	13-547-306
3C-141345-D	13-547-422
3C-141355-B	13-547-290
3C-141380-D	13-547-410
3C-141398-D	13-547-016
3C-141398-DZ	13-547-434
3C-141410-C	13-547-482
3C-141410-CZ	13-547-024
3C-141410-K4	13-547-164
3C-141410-M	13-547-026
3C-141412-C	13-547-030
3C-141412-CD	13-547-316
3C-141412-CDZ	13-547-288
3C-141412-CZ	13-547-034
3C-141412-C24Z	13-547-022

CATALOG CODE	MODEL NUMBER
3C-141412-K4	13-547-296
3C-141412-K4Z	13-547-036
3C-141412-M	13-547-038
3C-141422-C	13-547-046
3C-141424-CZ	13-547-486
3C-141425-C	13-547-054
3C-141428-C	13-547-058
3C-141430-C	13-547-064
3C-141430-C24Z	13-547-544
3C-141445-C	13-547-072
3C-141445-CZ	13-547-362
3C-141445-C2	13-547-208
3C-141445-C2Z	13-547-522
3C-141445-C24	13-547-424
3C-141445-K4	13-547-384
3C-141445-M	13-547-352
3C-141454-C	13-547-074
3C-141455-B	13-547-354
3C-141455-BZ	13-547-298
3C-141455-C	13-547-076
3C-141455-CD	13-547-344
3C-141455-CS	13-547-452
3C-141455-CZ	13-547-078
3C-141455-C24	13-547-492
3C-141455-M	13-547-364
3C-141466-C	13-547-082
3C-141466-CZ	13-547-474
3C-141466-C24	13-547-358
3C-141466-M	13-547-204
3C-141466-MZ	13-547-226
3C-141470-C	13-547-084
3C-141470-CZ	13-547-086
3C-141470-C2Z	13-547-558
3C-141480-B	13-547-342

CATALOG CODE	MODEL NUMBER
3C-141480-BZ	13-547-472
3C-141480-C	13-547-090
3C-141480-K4	13-547-094
3C-141480-K4Z	13-547-254
3C-141480-M	13-547-096
3C-141480-C2Z	13-547-560
3C-141485-C	13-547-098
3C-141498-C	13-547-102
3C-141498-C2	13-547-104
3C-141498-CS	13-547-106
3C-141498-CV	13-547-450
3C-141498-CZ	13-547-108
3C-141498-C24	13-547-396
3C-141498-C24Z	13-547-048
3C-141498-K4	13-547-110
3C-141498-M	13-547-116
3C-141498-MD	13-547-378
3C-141712-C	13-547-118
3C-141724-CZ	13-547-464

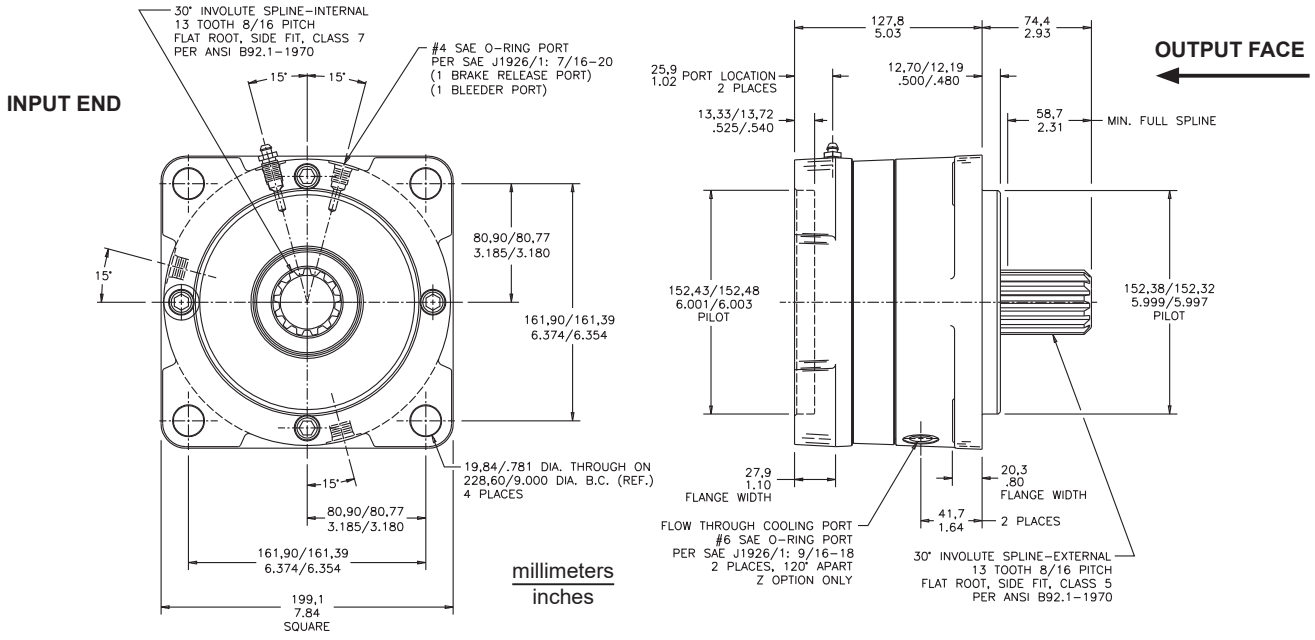
CATALOG CODE	MODEL NUMBER
3C-141754-C	13-547-214
3C-141755-C	13-547-120
3C-141785-C	13-547-182
3C-141798-C	13-547-294
3C-142098-L4	13-547-426
3C-171485-C	13-547-122
3C-171712-C	13-547-462
3C-171780-C	13-547-124
3C-171785-C	13-547-278
3C-171785-CZ	13-547-126
3C-171798-C	13-547-212
3C-212145-C	13-547-332
3C-212145-CZ	13-547-526
3C-212166-C	13-547-130
3C-212180-C	13-547-132
3C-212185-C	13-547-220
3C-212198-C	13-547-134
3C-251498-K4	13-547-334
3C-251498-K4	4071240050

D-Mount Brakes, Modular Design

FEATURES

- Oil cooled or dry design applications
- Simple four-bolt mounting configuration
- Low-release pressures, ideal for use with closed-loop hydrostatic systems
- Rugged heavy-duty construction
- Heat treated 8620 steel shafts for high strength and long life
- Unique balanced piston design

13-552-006
(3D-131312-DZ)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . . .621 - 2712 N·m (5500 - 24,000 lb·in)
Release pressure range . . . . . 7.6 - 26.9 bar (110 - 470 PSI)
Maximum operating pressure . . . . . 206.8 bar (3000 PSI)
Maximum speed . . . . . 4000 RPM
Volume of oil to release brake . . . . . 16.4 cm^3 (1.0 in^3)
Maximum energy input . . . . . 610,200 joule (450,000 ft·lb) (one stop, no damage)
Fluid type . . . . . Mineral base hydraulic oil
Maximum operating temperature. . . . . 132 °C (270 °F)
Approximate weight . . . . . 24 kg (52 lb)

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.
NOTE: On oil cooled models (Z option) actual torque is 67% of value shown on torque code chart. Recommended sump oil fluid volume when mounted: Horizontal - 147.9 mL (5 oz), Vertical - Contact ZF Off-Highway.

OUTPUT FACE
3D - SAE D-Mount 4-Bolt

OPTIONS
Z - Oil Cooled - see note above

OUTPUT SPLINE / INPUT SPLINE

13/00
13/13
13/14
13/15
13/16
13/21

SAE and DIN 5480 Designation
00 = Used with "R" input face only
13 = 13T 8/16
14 = 14T 12/24
15 = 15T 8/16
16 = 16T 8/16
21 = N45 x 2 x 21 x 9H

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

INPUT FACE
C - SAE C-Mount
D - SAE D-Mount
E - SAE E-Mount
R - Closed Face

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
80	904	(8000)	9.0	(130)	11.7	(170)
55	621	(5500)	5.5	(80)	7.6	(110)
24	2712	(24,000)	22.8	(330)	32.4	(470)
20	2260	(20,000)	18.6	(270)	26.2	(380)
16	1808	(16,000)	14.5	(210)	20.7	(300)
12	1356	(12,000)	11.0	(160)	15.9	(230)
10	1130	(10,000)	10.3	(150)	13.8	(200)

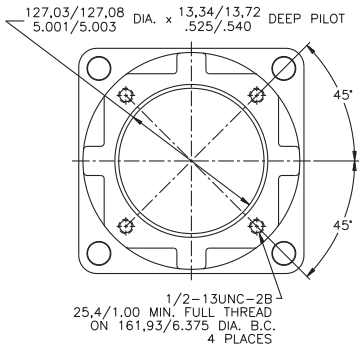
Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

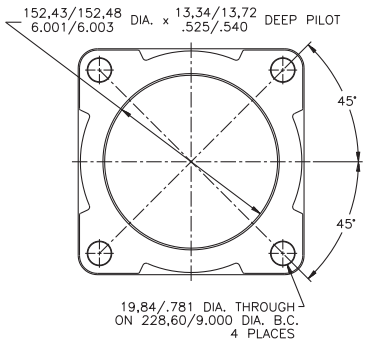
CATALOG CODE	MODEL NUMBER
3D-130024-R	13-552-076
3D-130024-RZ	13-552-124
3D-131310-D	13-552-040
3D-131310-E	13-552-042
3D-131312-D	13-552-002
3D-131312-DZ	13-552-006
3D-131316-C	13-552-016
3D-131316-D	13-552-008
3D-131320-D	13-552-060
3D-131324-D	13-552-070
3D-131324-DZ	13-552-086
3D-131355-D	13-552-012
3D-131380-D	13-552-033
3D-131380-DZ	13-552-036
3D-131380-E	13-552-044

CATALOG CODE	MODEL NUMBER
3D-131416-C	13-552-094
3D-131424-CZ	13-552-102
3D-131480-C	13-552-038
3D-131512-E	13-552-078
3D-131512-EZ	13-552-104
3D-131516-E	13-552-090
3D-131524-EZ	13-552-106
3D-131580-E	13-552-100
3D-131624-C	13-552-080
3D-132112-D	13-552-054

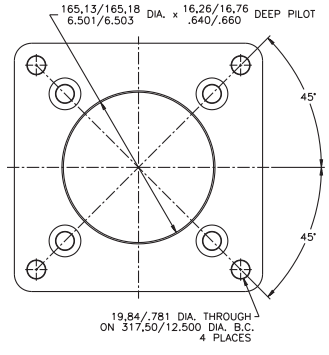
Input Faces



C - SAE C-Mount



D - SAE D-Mount



E - SAE E-Mount

Multiple Disc Brakes Narrow Design

Features

- Complete self-contained package
- Standard SAE mounting flanges
- Spring loaded, hydraulically released
- High-strength ductile iron construction
- Sealed environment - isolation from contaminants

Benefits

- Thick discs eliminate tooth wear-out and brake "freewheeling," resulting in longer life between parts replacement
- Large inlet port helps avoid sluggish response if air is entrapped in the oil
- One piece separator design helps eliminate breaking and bending moments on piston, resulting in minimal loss because of good contact on plates
- Longer dowel pins simplify assembly and keep rotor in place, reducing risk of shearing teeth from rotor

Operation

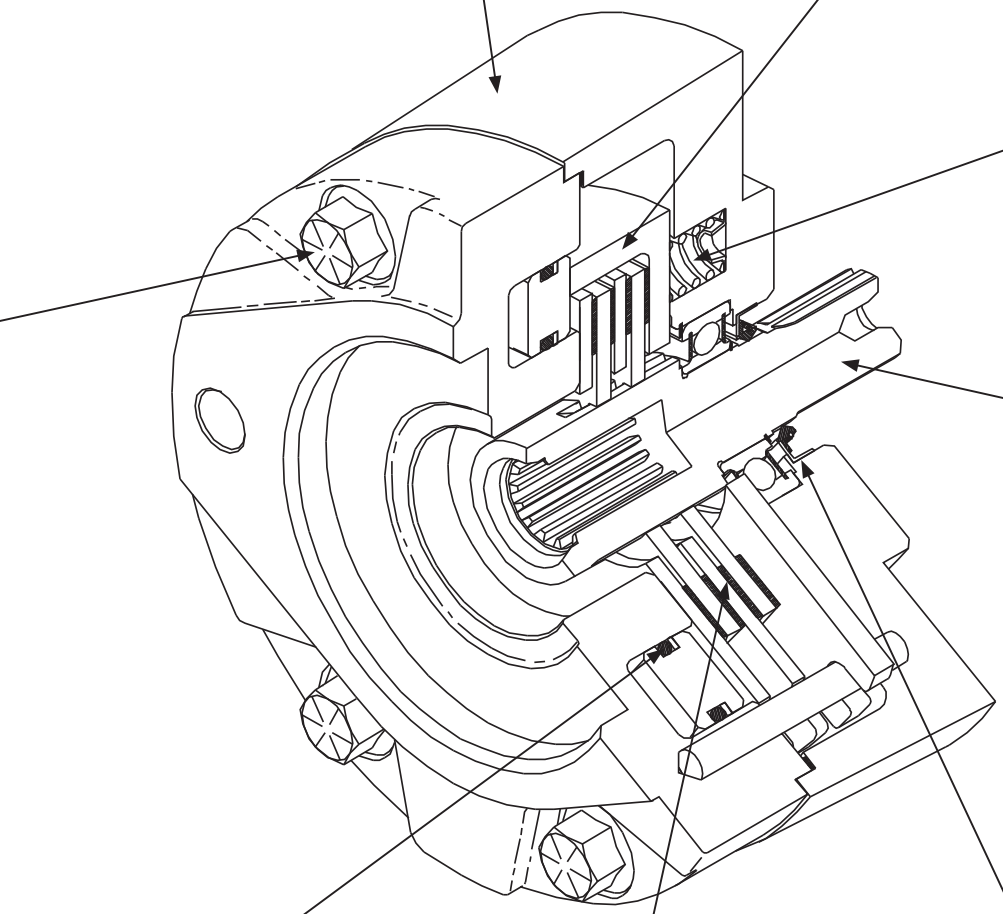
Braking using this version is provided by a pack of rotating friction discs splined to the shaft and stationary separator plates restrained by pins in the housing. Force is transmitted to the disc pack through the return plate by a series of preloaded springs. The brakes are released by hydraulic pressure applied to the piston to compress the springs. They are self-applying since any function which reduces the hydraulic pressure below the release pressure will start to initiate a brake application. Zero pressure produces maximum brake torque.

Cover Bolts are high-strength SAE grade 8 flanged type, which allow for higher brake release pressure shocks without subsequent cover bolt damage.

O-ring and Back-up ring combination on all models.

Housings are constructed of high quality ductile iron castings for strength and durability.

Piston Separator design allows for easier disassembly and assembly. This one piece powdered metal design as opposed to a split piston design, helps eliminate breaking and bending moments on piston.



Chrome Silicon Die Springs provide higher torque capabilities where space is limited, resulting in longer service life.

Spline Shafts are constructed of high quality, heat treated 8620 steel for high strength and long life. The precision ground one-piece spline shafts reduce vibration.

Rotary Shaft Seal at output end to prevent oil and other contaminants from entering brake.

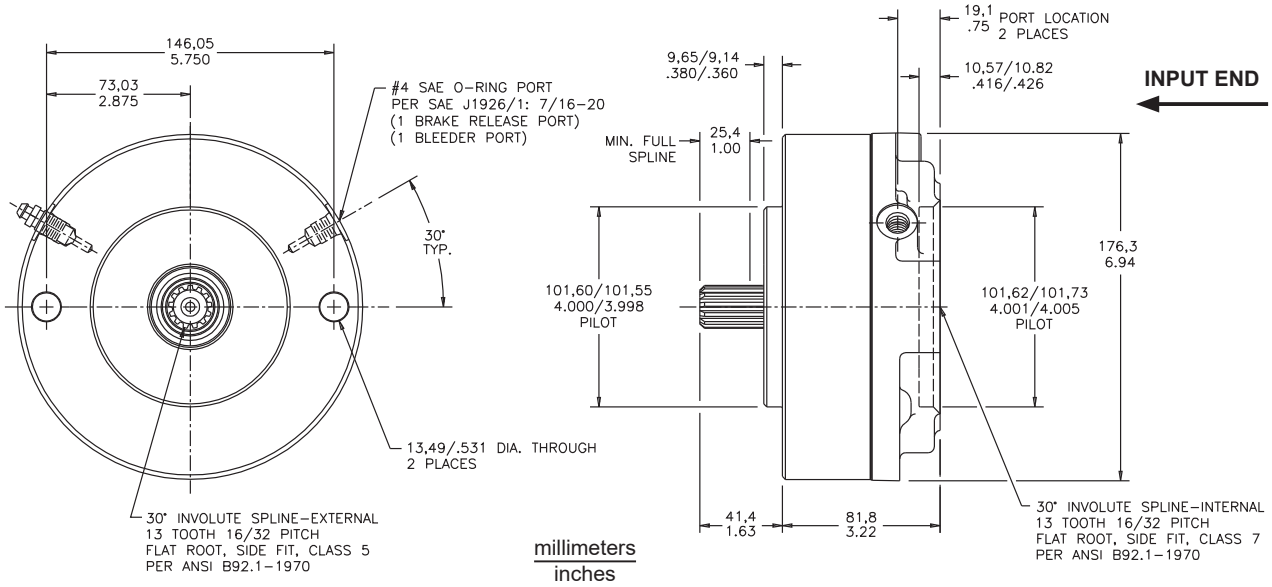
Friction Discs use sintered metallic linings and high strength 1035-1050 steel core material for long life.

B-Mount Brakes, Narrow Design

FEATURES

- Complete self-contained dry design package
- Standard SAE mounting flanges
- High-strength ductile iron castings for strength and durability
- Sintered bronze or non-metallic friction plates for high strength and long lining life
- Sealed environment - isolated from contaminants
- Optional pressure override models available for limited service braking
- Customizable speed sensor port size to meet customer requirements

02-556-326
(LMB-131321-B)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . . 113 - 542 N·m (700 - 6000 lb·in)
Release pressure range . . . . . 8.3 - 23.8 bar (120 - 345 PSI)
Maximum operating pressure . . . . . 206.8 bar (3000 PSI)
Maximum speed . . . . . 4000 RPM
Volume of oil to release brake . . . . . 8.2 cm^3 (0.5 in^3) (new linings)
14.8 cm^3 (0.9 in^3) (maximum)
Maximum energy input . . . . . 339,000 joule (250,000 ft·lb) (one stop, no damage)

Fluid type . . . . . Mineral base hydraulic oil
Maximum operating temperature . . . . . 132 °C (270 °F)
Approximate weight . . . . . 10.9 kg (24 lb)

Optional pressure override section
Service torque rating . . . . . 305 N·m @ 69.0 bar (2700 lb·in @ 1000 PSI)
Maximum input pressure . . . . . 69.0 bar (1000 PSI)

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.
NOTE: On oil cooled models (Z option) actual torque is 67% of value shown on torque code chart. Recommended sump oil fluid volume when mounted: Horizontal - 88.7 mL (3 oz), Vertical - Contact ZF Off-highway.

SERIES
LM - ZF Off-Highway

OUTPUT FACE
B - SAE B-Mount 2-Bolt

OUTPUT SPLINE / INPUT SPLINE

06/06
13/06
13/12
13/13
14/13
15/12
15/15

SAE Designation
06 = 25.4 mm (1.00 in) Diameter 6B
12 = 12T 12/24 used with L2 input face only
13 = 13T 16/32
14 = 14T 12/24
15 = 15T 16/32

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

NOTE: We recommend that all applications for pressure override brakes have a completed Data Sheet submitted to the Applications Department. Complete the Application Data Sheet (80-500-010).

OPTIONS
(Available separately or in combination)
P - Pressure Override
S - Speed Sensor
Z - Oil Cooled - see note above

INPUT FACE
B - SAE B-Mount 2-Bolt
L2 - Eaton Bearingless 2000
M - Modified SAE A-Mount 2 or 4-Bolt
N - NEMA

See page 47 for Input Face Dimensions

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
60	678	(6000)	23.1	(335)	27.6	(400)
51	576	(5100)	20.0	(290)	23.4	(340)
50	565	(5000)	22.1	(320)	27.6	(400)
48	542	(4800)	17.9	(260)	21.4	(310)
40	452	(4000)	15.2	(220)	17.9	(260)
35	396	(3500)	20.0	(290)	23.8	(345)
30	339	(3000)	16.5	(240)	20.0	(290)
29	328	(2900)	11.0	(160)	15.9	(230)
28	316	(2800)	15.9	(230)	19.3	(280)
26	294	(2600)	9.7	(140)	12.0	(175)
25	283	(2500)	9.7	(140)	11.7	(170)
24	271	(2400)	12.4	(180)	15.2	(220)
21	237	(2100)	12.4	(180)	14.5	(210)
19	215	(1900)	11.7	(170)	13.8	(200)
17	192	(1700)	9.7	(140)	11.7	(170)
16	181	(1600)	7.9	(115)	9.3	(135)
15	170	(1500)	5.9	(85)	7.6	(110)
14	158	(1400)	8.3	(120)	10.0	(145)
12	136	(1200)	13.8	(200)	16.2	(235)
11	124	(1100)	9.3	(135)	11.0	(160)
10	113	(1000)	11.7	(170)	13.8	(200)
08	90	(800)	7.2	(105)	7.9	(115)
07	79	(700)	3.4	(50)	4.1	(60)

Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

CATALOG CODE	MODEL NUMBER
LMB-060651-B	02-556-420
LMB-130614-M	02-556-304
LMB-130616-MP	02-556-434
LMB-130621-M	02-556-328
LMB-130628-M	02-556-378
LMB-130635-M	02-556-336
LMB-130640-M	02-556-358
LMB-131219-L2	02-556-348
LMB-131226-L2	02-556-464
LMB-131228-L2	02-556-350
LMB-131240-L2	02-556-352
LMB-131308-N	02-556-406
LMB-131310-B	02-556-322
LMB-131311-NS	02-556-390
LMB-131312-B	02-556-330
LMB-131314-B	02-556-318
LMB-131315-BP	02-556-398

CATALOG CODE	MODEL NUMBER
LMB-131317-B	02-556-332
LMB-131321-B	02-556-326
LMB-131324-B	02-556-360
LMB-131326-B	02-556-380
LMB-131328-B	02-556-324
LMB-131329-BS	02-556-418
LMB-131330-B	02-556-320
LMB-131335-B	02-556-334
LMB-131340-B	02-556-376
LMB-141360-M	02-556-422
LMB-151240-L2	02-556-428
LMB-151250-L2	02-556-454
LMB-151507-B	02-556-432
LMB-151525-B	02-556-458
LMB-151528-B	02-556-404
LMB-151535-B	02-556-340
LMB-151540-B	02-556-392

Multiple Disc Brakes Compact Design

Features

- Non-metallic lining material
- Extreme compact design
- Low release pressures
- Full system pressure capacity
- Low actuation volume

Benefits

- Design allows for pressure spikes of up to 275.8 bar (4000 PSI) without affecting cycle life
- One repair kit for all serviceable parts
- Non-metallic lining material contributes to high torque and low release pressure

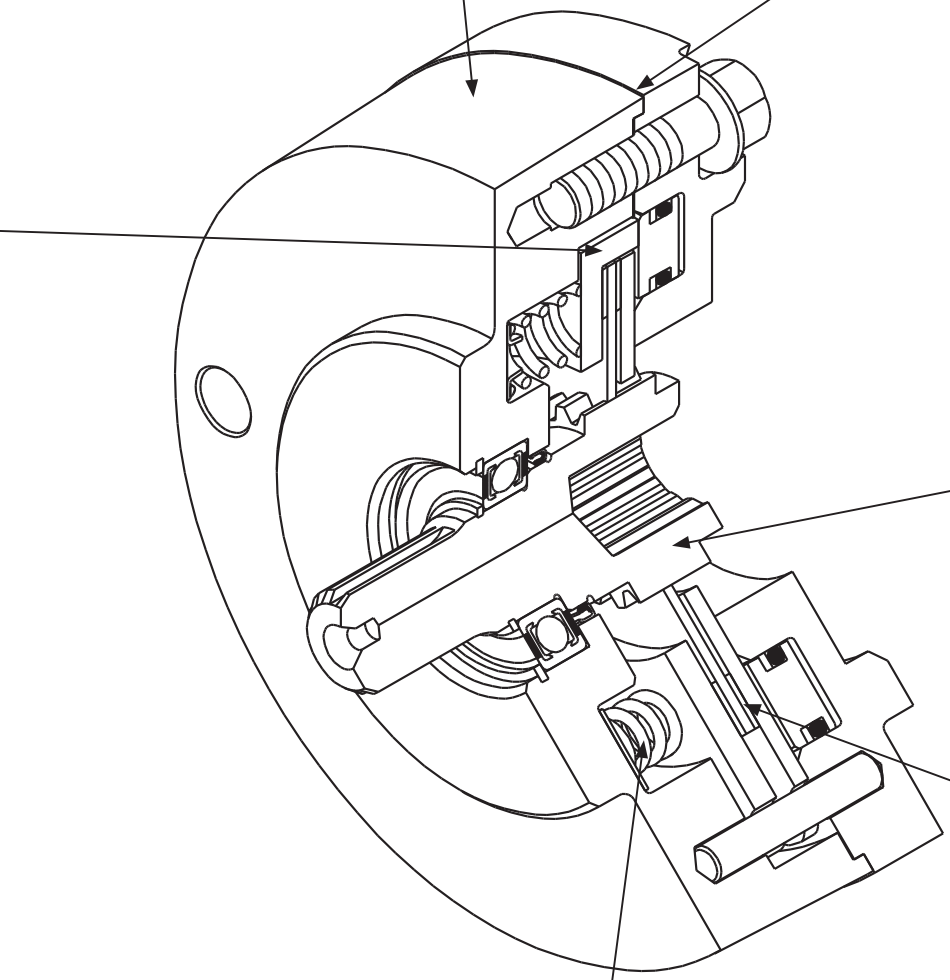
Operation

Braking is provided by stationary friction plates and a rotating disc splined to the shaft. Force is transmitted to the disc pack through the return plate by a series of preloaded springs. The brake is released by hydraulic pressure applied to the piston to compress the springs. The brake is self-applying since any function which reduces the hydraulic system pressure of the brake will start to initiate a brake application. Zero pressure produces maximum brake torque.

Integrated return plate/separators help prevent piston cocking.

High quality ductile iron casting material for strength and durability.

Gasket design and high-strength bolts provide high pressure capability and long life.



8620 alloy steel shafts are heat treated for strength and shock resistance.

High performance non-metallic lining materials contribute to high torque, low release pressure.

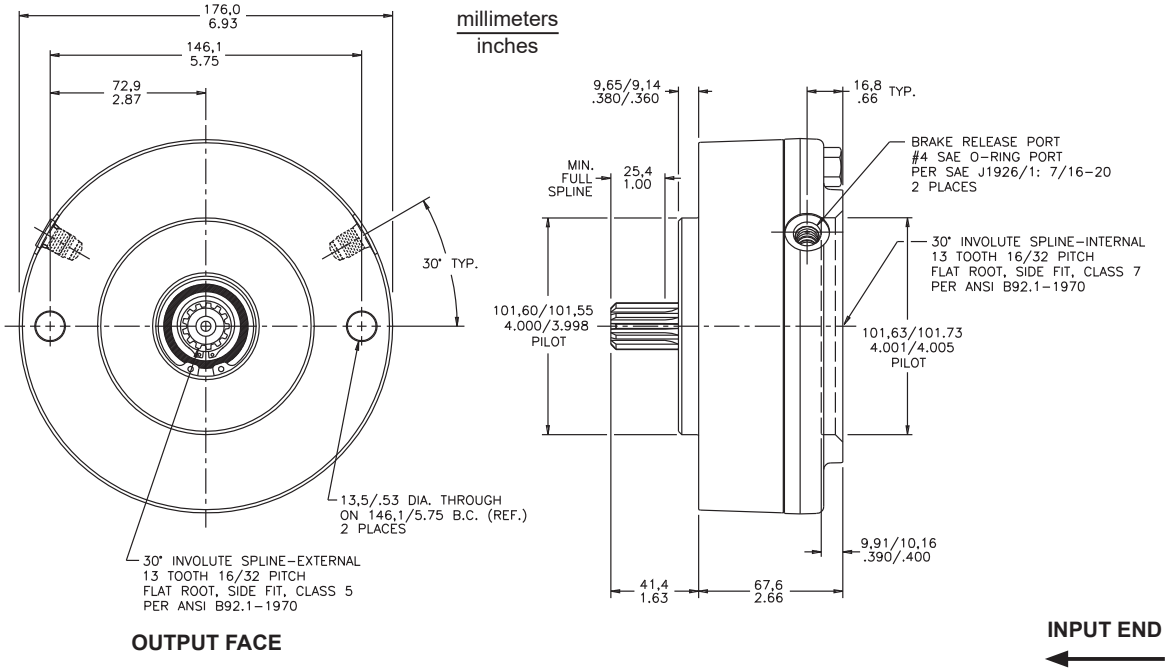
Chrome silicon die springs for long life and high torque.

B-Mount Multiple Disc Brakes, Compact Design

FEATURES

- Non-metallic lining material
- Extremely compact package length
- Low release pressures - ideal for use with closed-loop hydraulic systems
- Full system pressure capacity
- Low actuation volume needed

13-100-002
(GB-131312-B)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . . .136 - 452 N·m (1200 - 6000 lb·in)
Release pressure range . . . . . 6.9 - 20.0 bar (100 - 290 PSI) initial
7.9 - 23.4 bar (115 - 340 PSI) full
Maximum operating pressure . . . . . 206.8 bar (3000 PSI) continuous
Maximum speed . . . . . 4000 RPM shaft speed capability specified is for brake in released condition.
Energy absorption during apply cycle must be carefully examined for each application.

Volume of oil to release brake . . . . . 8.2 cm^3 (0.5 in^3) minimum
14.8 cm^3 (0.9 in^3) maximum
Maximum energy input . . . . . 231,000 joule (170,385 ft·lb)
Spline shaft . . . . . 30° involute, flat root side fit per ANSI B92.1 - 1970
Fluid type . . . . . Mineral base hydraulic oil
Maximum operating temperature . . . . . 132 °C / 270 °F
Approximate weight . . . . . 10.3 kg (19 lb)

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

G B – □□□□ □□ – □□

B-MOUNT COMPACT

OUTPUT FACE

SAE B-Mount 2-Bolt

OUTPUT SPLINE / INPUT SPLINE

06/06
13/06
13/13
14/12
14/14
15/12

SAE Designation
06 = 25.4 mm (1.00 in) diameter 6B
12 = 12T 12/24 used with L2 input face only
13 = 13T 16/32
14 = 14T 12/24
15 = 15T 16/32

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

INPUT FACE

B - SAE B-Mount 2-Bolt
L2 - Eaton Bearingless 2000
M - Modified SAE A-Mount 2 or 4 Bolt

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
60*	678	(6000)	26.2	(380)	30.3	(440)
51	576	(5100)	22.1	(320)	25.2	(365)
50	565	(5000)	21.4	(310)	26.2	(380)
48	542	(4800)	20.7	(300)	23.8	(345)
40	452	(4000)	20.0	(290)	23.4	(340)
35	396	(3500)	16.5	(240)	19.3	(280)
28	316	(2800)	13.8	(200	16.2	(235)
24	271	(2400)	13.1	(190)	14.8	(215)
21	237	(2100)	11.8	(165)	13.1	(190)
16	181	(1600)	8.6	(125)	10.0	(145)
14	158	(1400)	7.6	(110)	8.6	(125)
12	136	(1200)	6.9	(100)	7.9	(115)

* For use with input and output spline code 14 only.

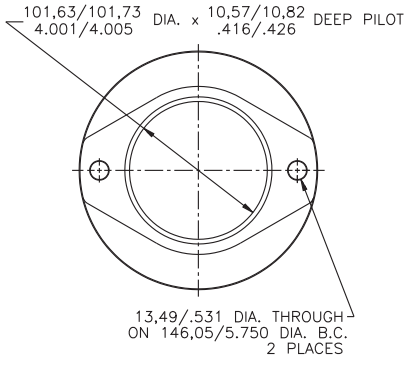
Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

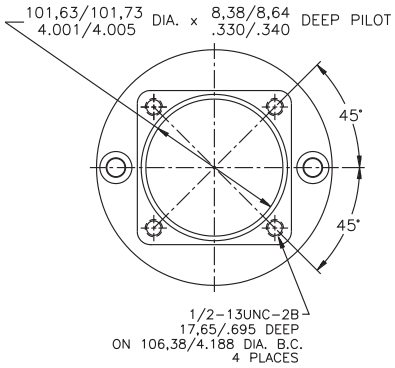
CATALOG CODE	MODEL NUMBER
GB-060628-B	13-100-046
GB-060635-B	13-100-054
GB-130648-M	13-100-040
GB-131312-B	13-100-002
GB-131314-B	13-100-004
GB-131316-B	13-100-006
GB-131321-B	13-100-024
GB-131324-B	13-100-022
GB-131328-B	13-100-010

CATALOG CODE	MODEL NUMBER
GB-131335-B	13-100-012
GB-131340-B	13-100-014
GB-131351-M	13-100-018
GB-141260-L2	13-100-044
GB-141240-L2	13-100-064
GB-141460-M	13-100-020
GB-151250-L2	13-100-048

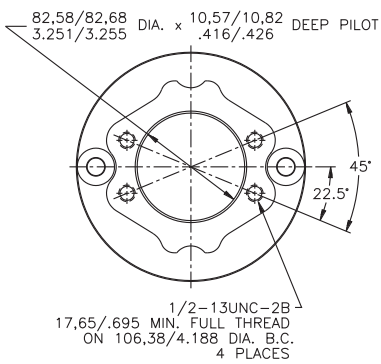
Input Faces



B - SAE B-Mount 2-Bolt



L2 - Eaton Bearingless 2000



M - Modified SAE A-Mount 2-Bolt or 4-Bolt

Closed Output Motor Brakes

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

NOTE: Dry design only, not for wet applications.

		–	1	3			–			

THROUGH-SHAFT BRAKE PRODUCT CODE

MN - Parker Nichols Series 110A (also former Nichols Series 100, 110, 120, 130)

MS - Sauer Danfoss

INPUT SPLINE

13 - 13T 16/32

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

INPUT FACE

M35 - Sauer Danfoss 5.75 inch B.C.

M46 - Sauer Danfoss 6.125 inch B.C.

TORQUE

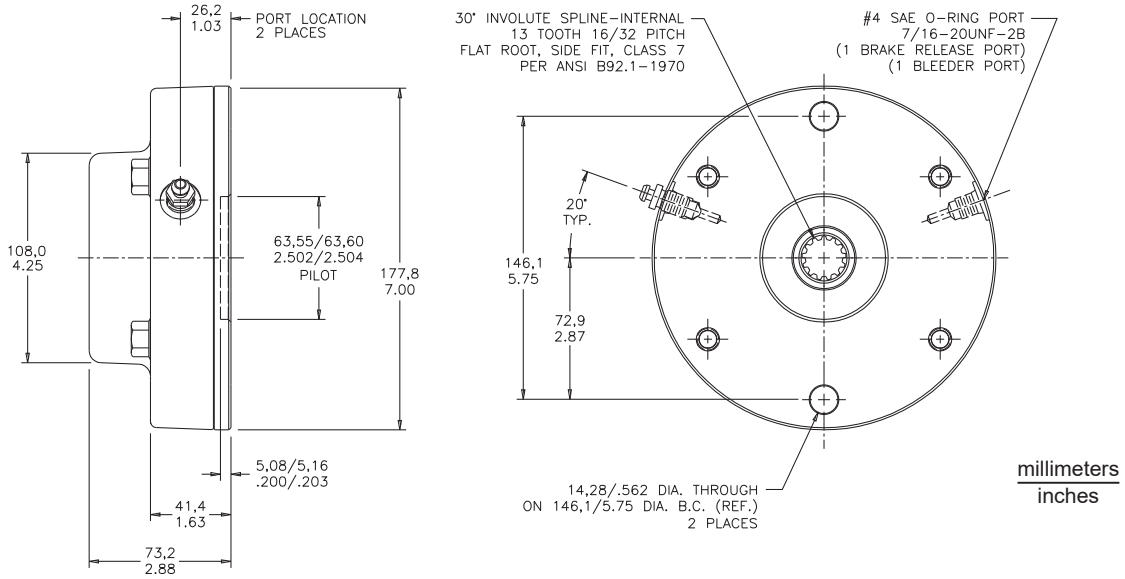
Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
56	633	(5600)	20.0	(290)	25.5	(370)
42	475	(4200)	15.9	(230)	20.7	(300)
35	396	(3500)	12.4	(180)	16.5	(240)
25	282	(2500)	8.3	(120)	10.3	(150)
15	170	(1500)	4.8	(70)	6.6	(95)

Other torques and/or release pressures are available upon request.

FEATURES

- Mates with Parker Nichols & Sauer Danfoss through-shaft motors
- Low cost with high torque capacity

02-550-116
(MN-1356)



SPECIFICATIONS

Torque rating at 0 bar (0 PSI) back pressure. . . . . .283 - 633 N·m (2500 - 5600 lb·in)
Release pressure range . . . . . 10.3 - 25.5 bar (150 - 370 PSI)
Maximum operating pressure . . . . . 206.8 bar (3000 PSI)
Maximum speed . . . . . 1000 RPM (MN)
4000 RPM (MS)
Volume of oil to release brake . . . . . 7.4 cm^3 (0.45 in^3)
Maximum operating temperature. . . . . 132 °C (270 °F)
Approximate Weight . . . . . 8.2 kg (18 lb)
Fluid type . . . . . Mineral base hydraulic oil
Maximum energy input . . . . . 135,600 joule (100,000 ft·lb)

ASSIGNED NUMBERS

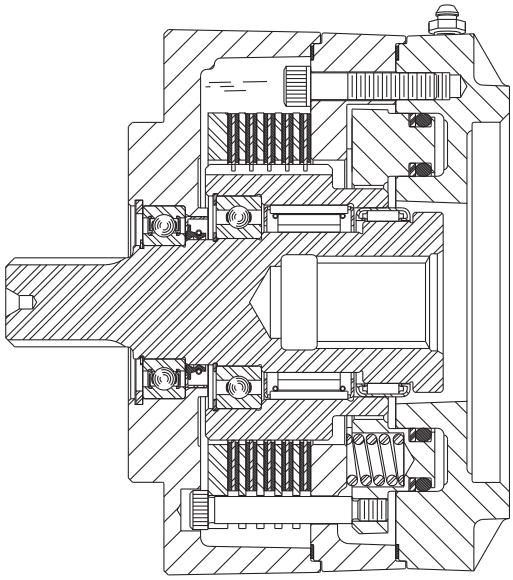
CATALOG CODE	MODEL NUMBER
MN-1315	02-550-214
MN-1325	02-550-120
MN-1335	02-550-122
MN-1342	02-550-114
MN-1356	02-550-116
MS-1325-M35	02-550-124
MS-1325-M46	02-550-118

Posi-Torque Winch Brakes

The compact size of these Posi-Torque Winch Brakes permit easy installation into restricted space without requiring special adjustment, alignment, shims or brackets. Large diameter friction discs are possible because of the location of the tension pins. With these large discs the posi-torque brake develops more retarding torque than comparable sized units. The balanced piston design keeps critical components in tension when the brake is engaged. This helps eliminate bending or fracturing due to stress.

If winching is the application, a Spring Apply, Hydraulic Release, Multiple Disc Brake with posi-torque option is the ideal choice. This brake is designed primarily for use on a hydraulically driven winch system. It combines the benefits of allowing one-way winching, positive load positioning and “runaway” protection all in a single, compact package.

Quality pays in performance and reliability



LUBRICATION

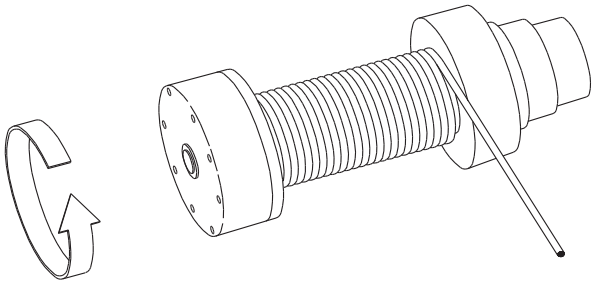
Oils containing slippery or antiwear additives, such as graphite or molybdenum disulfide or extreme pressure (EP) type lubricants, may allow the brake to slip at torque levels below the rated values and should be avoided.

Zf Off-Highway recommends a good grade of ATF, SAE 10 or SAE 20 oil, or Mobil DTE and oils meeting MIL.7808 or MIL.23699.

Benefits

THE BRAKE "FREEWHEELS" IN THE LIFT DIRECTION

The Posi-Torque Brake is engaged while the load is being raised. The brakes internal over-riding clutch "freewheels" allowing travel in only one direction.

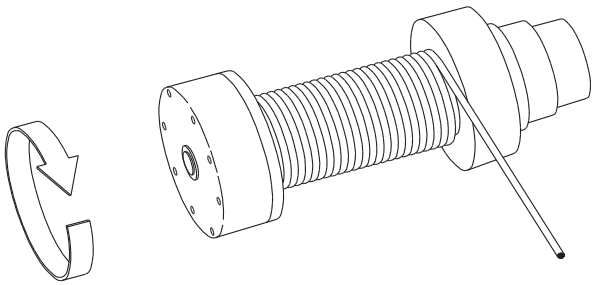


A ONE-WAY POSITIVE POSITIONING WINCH BRAKE

Once the winch stops lifting, the Posi-Torque Brake automatically holds the load in the desired position. Positive load positioning is immediately available because the brake is always engaged. There is no lag time or drift.

SAFE, RUNAWAY PROTECTION WHEN LOWERING THE LOAD

When lowering a load, hydraulic pressure disengages the Posi-Torque Brake. The load can be “powered” down using the winch’s hydraulic motor for safe, slow descent. If hydraulic pressure drops and the load begins to runaway from the motor, the Posi-Torque Brake automatically engages to bring the load to a safe controlled stop.

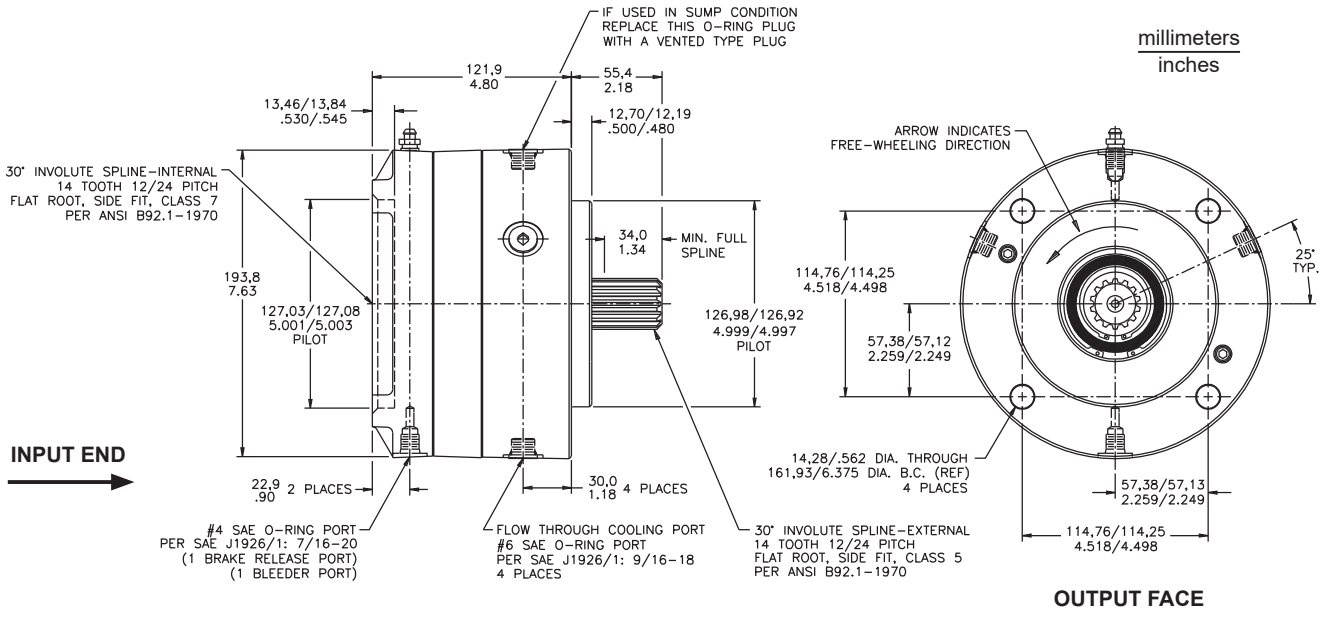


C-Mount Posi-Torque Brakes, Modular Design

FEATURES

- Wet design brake
- Nitrile case seals
- Positions the load at the instant the winch stops
- Compact size for easy installation
- Large-diameter discs
- Metallic linings for long life
- Hardened high-strength steel shafts
- Balanced piston design

13-602-006
(3CWC-141480-CCC)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . Oil cooled operation 452 - 904 N·m (4000 - 8000 lb·in)
Release pressure range . . . . . 13.1 - 25.5 bar (190 - 370 PSI)
Maximum operating pressure . . . . . 206.8 bar (3000 PSI)
Maximum speed
(Non-freewheeling direction) . . . . . (Flow through) 4000 RPM
(Sump) 3000 RPM
(Freewheeling direction) . . . . . (Flow through) 4000 RPM
(Sump) 4000 RPM
Optimal flow through cooling . . . . . 3.8 - 26.5 L/min (1 - 7 GPM)
Maximum case pressure . . . . . 2.1 bar (30 PSI)
Sump cooling fluid volume . . . . . 177.4 mL (6 oz)
Volume of oil to release brake . . . . . 16.4 cm^3 (1.0 in^3)
Maximum energy input . . . . . 542,400 joule (400,000 ft□lb) (one stop, no damage)
Fluid type . . . . . Mineral base hydraulic oil
Maximum operating temperature . . . . . 132 °C (270 °F)
Approximate weight . . . . . 19 kg (42 lb)

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.
NOTE: Wet design only, not intended for dry applications. To be installed in horizontal position only.

3	C	W	C	–						–					

3CW -C-MOUNT POSI-TORQUE WINCH BRAKE

OUTPUT FACE

C - SAE C-Mount 4-Bolt

OUTPUT SPLINE / INPUT SPLINE

04/14
14/14

SAE Designation
04 = 14T 12/24 (internal)
14 = 14T 12/24

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

FREEWHEELING DIRECTION CODE

(As you face the output end of brake)
CC - Counter Clockwise
CW - Clockwise

INPUT FACE

C - SAE C-Mount 4-Bolt
C24 - 2 Bolt and 4-Bolt C-Mount
K4 - Eaton Standard 4000
M - 4-Bolt and SAE A-Mount 2-Bolt

See page 47 for Input Face Dimensions

TORQUE

Code	Torque Rating		Initial Release Pressure		Full Release Pressure	
	N·m	(lb·in)	bar	(PSI)	bar	(PSI)
80	904	(8000)	18.6	(270)	25.5	(370)
75	848	(7500)	17.2	(250)	22.7	(330)
70	791	(7000)	15.8	(230)	21.4	(310)
65	734	(6500)	15.2	(220)	20.7	(300)
40	452	(4000)	9.6	(140)	13.1	(190)
22	249	(2200)	6.9	(100)	9.0	(130)

NOTE: Torque is coded as wet use.

Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

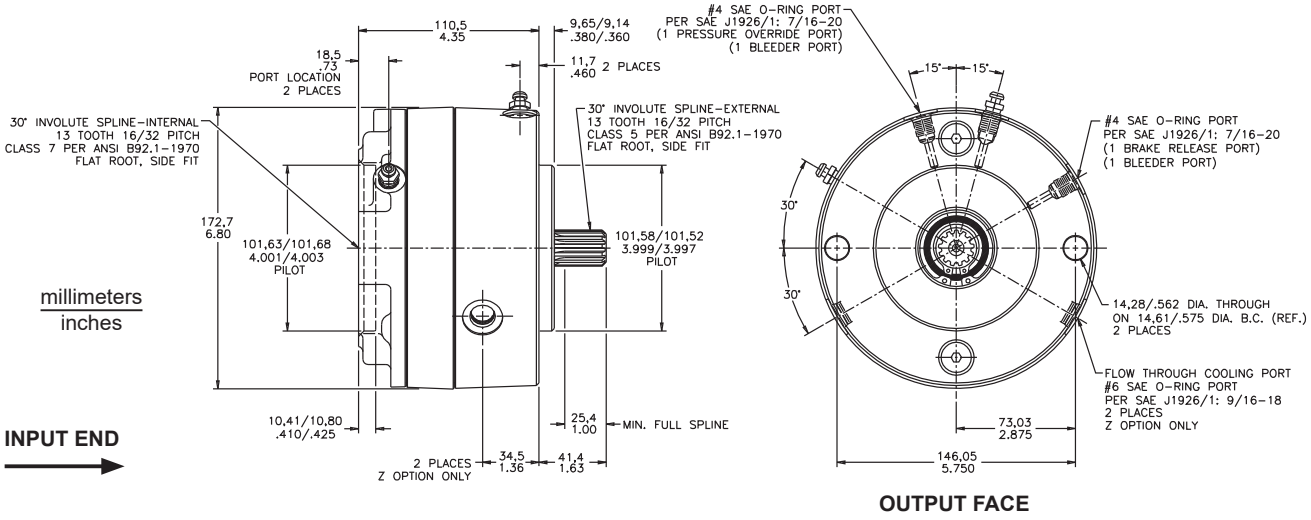
CATALOG CODE	MODEL NUMBER
3CWC-041440-CCW	13-602-046
3CWC-041422-CCW	13-602-002
3CWC-141422-CCC	13-602-044
3CWC-041422-CCW	13-602-042
3CWC-141440-CCC	13-602-022
3CWC-141440-C24CC	13-602-030
3CWC-141440-C24CW	13-602-032
3CWC-141465-CCC	13-602-010
3CWC-141465-CCW	13-602-012
3CWC-141465-MCC	13-602-024
3CWC-141465-MCW	13-602-020
3CWC-141475-CCW	13-602-034
3CWC-141480-CCC	13-602-006
3CWC-141480-CCW	13-602-008
3CWC-141480-MCC	13-602-018

B-Mount Pressure Override Brakes, Modular Design

FEATURES

- Secondary system for service braking with fail-safe backup
- Standard SAE mounting flanges
- Service brake can be modulated with automotive type master cylinder or hydraulic valve
- Oil cooled option for added capacity
- Nitrile case seals
- Compact modular design

13-592-036
(3PB-131328-B)



SPECIFICATIONS

FAIL-SAFE BRAKE

Torque range at 0 bar (0 PSI) back pressure	135.6 - 452 N·m (1200 - 6000 lb·in)
Release pressure range	5.5 - 24.1 bar (80 - 350 PSI)
Maximum continuous pressure	206.8 bar (3000 PSI)
Maximum speed	4000 RPM (See note below)
Volume of oil to release brake	8.2 cm^3 (0.5 in^3)
Fluid type	Mineral base hydraulic oil
Maximum operating temperature	132 °C (270 °F)
Approximate weight	13.6 kg (30 lb)
Optimal flow through cooling (wet design)	3.8 - 26.5 L/min (1 - 7 GPM)
Maximum case pressure	0.5 bar (7 PSI)
Sump cooling fluid volume (wet design) (horizontal)	88.7 mL (3 fl oz)
(vertical)	Contact ZF Off-Highway

SERVICE BRAKE

Maximum torque	(dry design) 452 N·m (4000 lb·in) (wet design) 384.2 N·m (3400 lb·in)
Calculated torque	(dry design) T = 5.50 x (PSI - 80) (wet design) T = 3.70 x (PSI - 80)
Maximum operating pressure	(wet design) 69 bar (1000 PSI) (dry design) 55.2 bar (800 PSI)
Maximum energy input (wet or dry design)	189,840 joule (140,000 ft·lb) (one stop, no damage)
Maximum energy input rate (dry design)	54,240 joules/s (40,000 ft·lb/s) (one stop, no damage)
(wet design)	108,480 joules/s (80,000 ft·lb/s) (one stop, no damage)
Piston volume	3.0 cm^3 (0.18 in^3)
Fluid type	Mineral base hydraulic oil

NOTE: Due to energy capacity limitations, maximum speed at time of service apply is dependent on product application.

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

NOTE: On oil-cooled models (Z option) actual torque is 67% of value shown on torque code chart.

3	P	B	–							–		

3P - PRESSURE OVERRIDE

OUTPUT FACE

B - SAE B-Mount 2-Bolt

OUTPUT SPLINE / INPUT SPLINE

13/06
13/13
15/15

SAE Designation
06 = 25.4 mm (1.00 in) diameter 6B
13 = 13T 16/32
15 = 15T 16/32

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

NOTE: We recommend that all applications for pressure override brakes have a completed Data Sheet submitted to the Application Department. Complete the Application Data Sheet (80-500-010).

OPTION

Z - Oil Cooled - see note above

INPUT FACE

B - SAE B-Mount
M - 4-Bolt and SAE A-Mount 2-Bolt

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
60*	678	(6000)	20.0	(290)	24.1	(350)
52*	588	(5200)	17.2	(250)	20.7	(300)
40	452	(4000)	13.8	(200)	16.5	(240)
35	396	(3500)	12.4	(180)	14.5	(210)
28	316	(2800)	9.6	(140	11.7	(170)
24	271	(2400)	8.3	(120)	10.3	(150)
19	215	(1900)	7.6	(110)	9.0	(130)
16	181	(1600)	6.2	(90)	7.6	(110)
12	136	(1200)	4.8	(70)	5.5	(80)

* Maximum dry service brake torque is 4000 lb·in. The 5200 lb·in, and 6000 lb·in torque is used only for coding of 3500 lb·in and 4000 lb·in oil-cooled brakes.

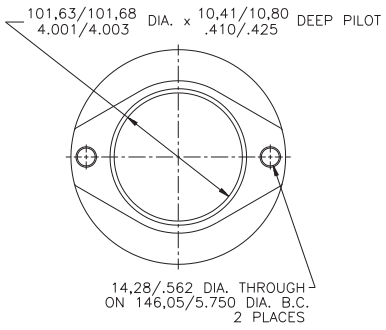
Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

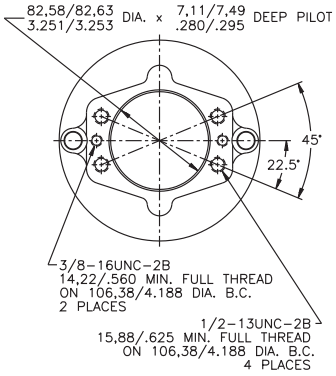
CATALOG CODE	MODEL NUMBER
3PB-130612-M	13-592-044
3PB-130619-MZ	13-592-046
3PB-130635-M	13-592-002
3PB-130640-M	13-592-004
3PB-130640-MZ	13-592-024
3PB-131328-B	13-592-036

CATALOG CODE	MODEL NUMBER
3PB-131335-B	13-592-010
3PB-131340-B	13-592-042
3PB-131340-MZ	13-592-022
3PB-131352-BZ	13-592-048
3PB-151552-BZ	13-592-050

Input Faces



B - SAE B-Mount



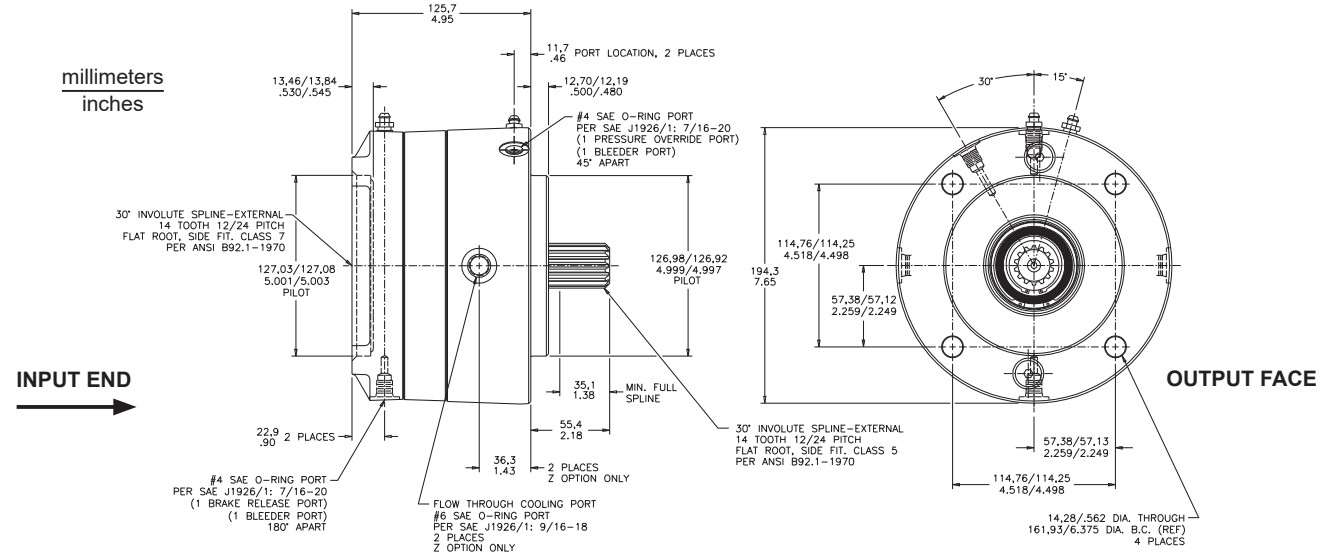
M - 4-Bolt and SAE A-Mount 2-Bolt

C-Mount Pressure Override Brakes, Modular Design

FEATURES

- Secondary system for service braking with fail-safe backup
- Standard SAE mounting flanges
- Service brake can be modulated with automotive type master cylinder or hydraulic valve
- Oil cooled option for added capacity
- Nitrile case seals
- Compact modular design

13-597-008
(3PC-141470-CZ)



SPECIFICATIONS

FAIL-SAFE BRAKE

Torque range at 0 bar (0 PSI) back pressure	407 - 1469 N·m (3600 - 13,000 lb·in)
Release pressure range	9.7 - 25.5 bar (140 - 370 PSI)
Maximum continuous pressure	206.8 bar (3000 PSI)
Maximum speed	4000 RPM (See note below)
Volume of oil to release brake	16.4 cm^3 (1.0 in^3)
Fluid type	Mineral base hydraulic oil
Maximum operating temperature	132 °C (270 °F)
Approximate weight	20 kg (44 lb)
Optimal flow through cooling (wet design)	3.8 - 26.5 L/min (1 - 7 GPM)
Maximum case pressure	0.5 bar (7 PSI)
Sump cooling fluid volume (wet design) (horizontal)	118.3 mL (4 fl oz)
(vertical)	Contact ZF Off-Highway

SERVICE BRAKE

Maximum torque	(dry design) 1062 N·m (9400 lb·in) (wet design) 700.6 N·m (6200 lb·in)
Calculated torque	(dry design) T = 10.10 x (PSI - 70) (wet design) T = 6.66 x (PSI - 70)
Maximum operating pressure	69.0 bar (1000 PSI)
Maximum energy input (wet or dry design)	406,800 joule (300,000 ft·lb) (one stop, no damage)
Maximum energy input rate (dry design)	101,700 joule/s (75,000 ft·lb/s) (one stop, no damage)
(wet design)	203,400 joule/s (150,000 ft·lb/s) (one stop, no damage)
Piston volume	5.2 cm^3 (0.32 in^3)
Fluid type	Mineral base hydraulic oil

NOTE: Due to energy capacity limitations, maximum speed at time of service apply is dependent on product application.

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

NOTE: On oil-cooled models (Z option) actual torque is 67% of value shown on torque code chart.

3P - PRESSURE OVERRIDE

OUTPUT FACE

C - SAE C-Mount 4-Bolt

OUTPUT SPLINE / INPUT SPLINE

	SAE Designation
14/00	00 = used with "R" only
14/06	06 = 25.4 mm (1.00 in) diameter 6B
14/13	13 = 13T 8/16
14/14	14 = 14T 12/24
23/23	23 = 23T 16/32

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

NOTE: We recommend that all applications for pressure override brakes have a completed Data Sheet submitted to the Applications Department. Complete the Application Data Sheet (80-500-010).

OPTION

(Available separately or in combination)
S - Speed Sensor
Z - Oil Cooled - see note above

INPUT FACE

C - SAE C-Mount Standard
C2 - SAE C-Mount 2-Bolt
C24 - 2 Bolt and 4-Bolt C-Mount
D - SAE D-Mount
K4 - Eaton Standard 4000
M - 4-Bolt and SAE A-Mount 2-Bolt
R - Closed Face

See page 48 for Input Face Dimensions

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
98	1107	(9800)	18.6	(270)	25.5	(370)
80	904	(8000)	15.2	(220)	20.7	(300)
70	791	(7000)	13.8	(200)	19.3	(280)
57	644	(5700)	12.4	(180)	19.3	(280)
55	622	(5500)	11.0	(160	15.2	(220)
45	508	(4500)	8.3	(120)	11.7	(170)
36	407	(3600)	6.9	(100)	9.6	(140)
13	1469	(13,000)	24.1	(350)	32.8	(475)

Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

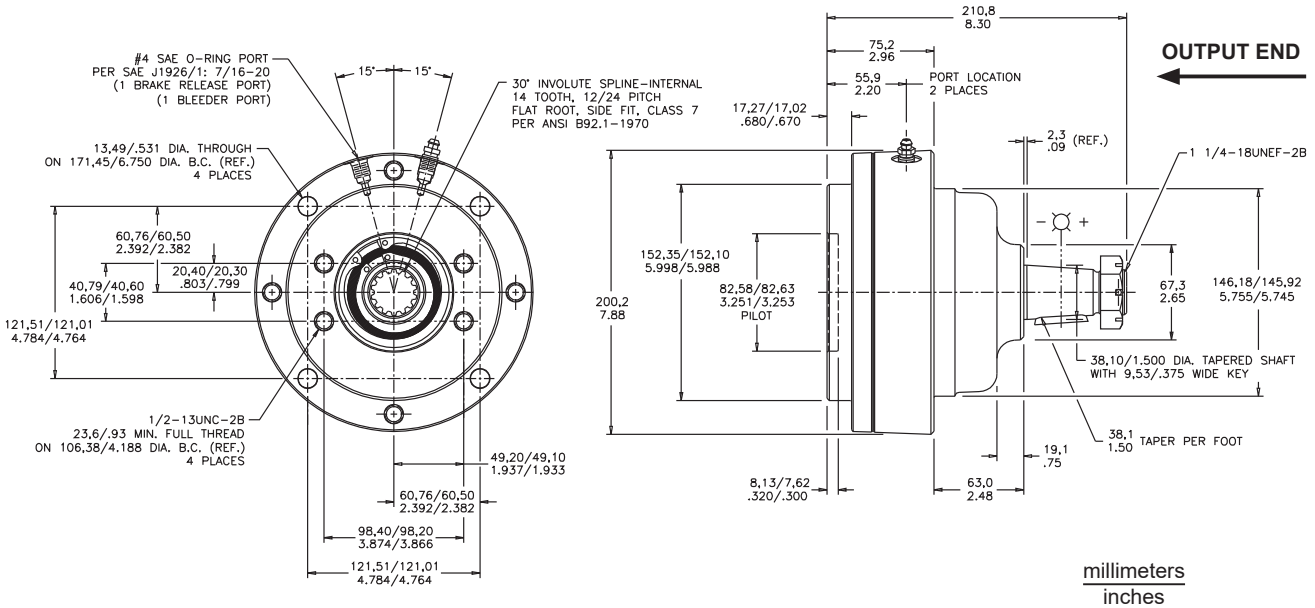
CATALOG CODE	MODEL NUMBER
3PC-140080-R	13-597-032
3PC-140645-M	13-597-034
3PC-140670-MZ	13-597-044
3PC-140680-M	13-597-026
3PC-141313-DZ	13-597-052
3PC-141398-DZ	13-597-046
3PC-141436-C	13-597-014
3PC-141436-C24	13-597-042
3PC-141436-M	13-597-040
3PC-141445-C24Z	13-597-030
3PC-141445-K4	13-597-072
3PC-141455-C	13-597-002
3PC-141455-CZ	13-597-016
3PC-141457-CZ	13-597-050
3PC-141470-C	13-597-004
3PC-141470-CZ	13-597-008
3PC-141470-MZ	13-597-080
3PC-141470-C24Z	13-597-054
3PC-141480-C	13-597-018
3PC-141480-CZ	13-597-024
3PC-141498-C	13-597-010
3PC-141498-CZ	13-597-022
3PC-141498-C24Z	13-597-056
3PC-232380-CZ	13-597-070

Large Wheel Mount Brakes, Motor Input

FEATURES

- Provision for direct mounting of brake to wheels
- Heat-treated 8620 shafts
- Complete self-contained, dry-design package
- Full system pressure capability

13-587-002
(WH-501415-M)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . . 904 - 1695 N·m (8000 - 15,000 lb·in)
Release pressure range . . . . . 21.4 - 34.5 bar (310 - 500 PSI)
Maximum operating pressure . . . . . 206.8 bar (3000 PSI)
Maximum speed . . . . . 1000 RPM
Volume of oil to release brake . . . . . 9.8 cm^3 (0.6 in^3)
Maximum energy input . . . . . 339,000 joule (250,000 ft·lb) (one stop, no damage)
Fluid type . . . . . Mineral base hydraulic oil
Maximum operating temperature . . . . . 132 °C (270 °F)
Approximate weight . . . . . 17.2 kg (38 lb)

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

NOTE: Dry design only, not for oil-cooled applications.

W	H	–						–		

WH - WHEEL MOUNT BRAKE

OUTPUT SHAFT / INPUT SHAFT

50/06
50/12
50/14
50/20

SAE Designation
06 = 25.4 mm (1.00 in) Diameter 6B
12 = 12T 22/24 modified (as required for Eaton 2000 Bearingless)
14 = 14T 12/24
20 = 20T 10/20
50 = 38.1 mm (1.50 in) Keyed, Taper

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

INPUT FACE

M - 4-Bolt and SAE A-Mount 2-Bolt
L2 - Eaton Bearingless 2000
L4 - Eaton Bearingless 4000
K4 - Eaton Standard 4000

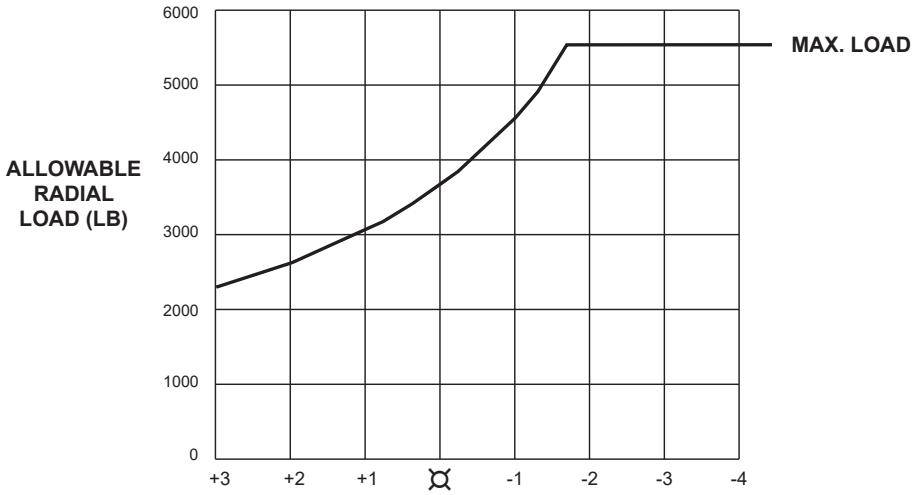
See page 48 for Input Face Dimensions

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
80	904	(8000)	14.5	(210)	21.4	(310)
24	2712	(24,000)	33.8	(490)	46.9	(680)
15	1695	(15,000)	26.9	(390)	40.0	(580)
12	1356	(12,000)	24.8	(360)	31.0	(450)
10	1130	(10,000)	17.9	(260)	26.2	(380)

Other torques and/or release pressures are available upon request.

LOAD CAPACITY @ 100 RPM AND B_{10} = 6500 HRS
325 RPM AND B_{10} = 2000 HRS



DISTANCE FROM CENTERLINE OF KEY (⌑) (INCHES)

(Refer to drawing on previous page)

ASSIGNED NUMBERS

CATALOG CODE	MODEL NUMBER
WH-500680-M	13-587-014
WH-501215-L2	13-587-004
WH-501280-L2	13-587-006
WH-501412-M	13-587-030
WH-501415-M	13-587-002
WH-501415-K4	13-587-008
WH-501480-M	13-587-012
WH-502024-L4	13-587-100

THRUST LOAD CAPACITY:

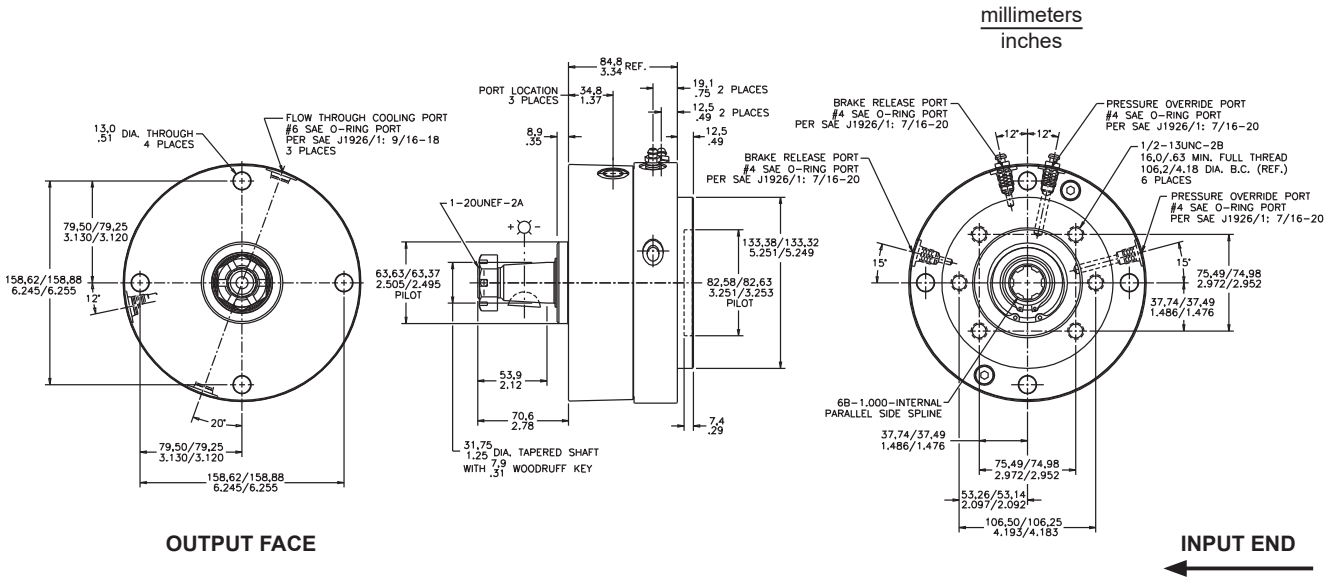
1100 lb max. @ 100 RPM & 2000 hrs B_{10} life. (Based on constant 3700 lb side-load at center-line of key)

Compact Wheel Mount Brakes, Motor Input

FEATURES

- Provides direct mounting of brake to wheel
- Wet design with patented pressure override option
- Metallic linings
- Designed for standard SAE hydraulic motor inputs

13-587-086
(MW-250642-AP)



SPECIFICATIONS

Type . . . . . Wet multiple disc brake, spring apply, hydraulic release with hydraulic apply service brake option
Release pressure . . . . . 26.9 bar (390 PSI) initial, 31.7 bar (460 PSI) full
206.8 bar (3000 PSI) maximum (continuous)
Torque rating
parking/emergency . . . . . 475 N·m (4200 lb·in) static @ 0 bar (0 PSI)
service brake . . . . . 396 N·m (3500 lb·in) dynamic @ 103.4 bar (1500 PSI) maximum input pressure
Maximum speed . . . . . 300 RPM
Maximum energy input . . . . . 418,000 joule (308,300 ft·lb)
Lining material . . . . . Metallic graphitic
Approximate weight . . . . . 12 kg (27 lbs)
Sump cooling fluid volume . . . . . 118.3 mL (4 fl. oz.)
Fluid type . . . . . Mineral base hydraulic oil

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

NOTE: Wet design only, not intended for dry applications. To be installed in horizontal position only.

M	W	–						4	2	–	A	

MW - MINI WHEEL BRAKE

OUTPUT SHAFT / INPUT SHAFT

50/06
25/06

SAE Designation
50 = 38.1 mm (1.50 in) Keyed, Taper
25 = 31.8 mm (1.25 in) Keyed, Taper
06 = 25.4 mm (1.00 in) Diameter 6B

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

NOTE: We recommend that all applications for pressure override brakes have a completed Data Sheet submitted to the Applications Department. Complete the Application Data Sheet (80-500-010).

OPTIONS

P - Pressure Override

INPUT FACE

A - SAE A-Mount 2-Bolt

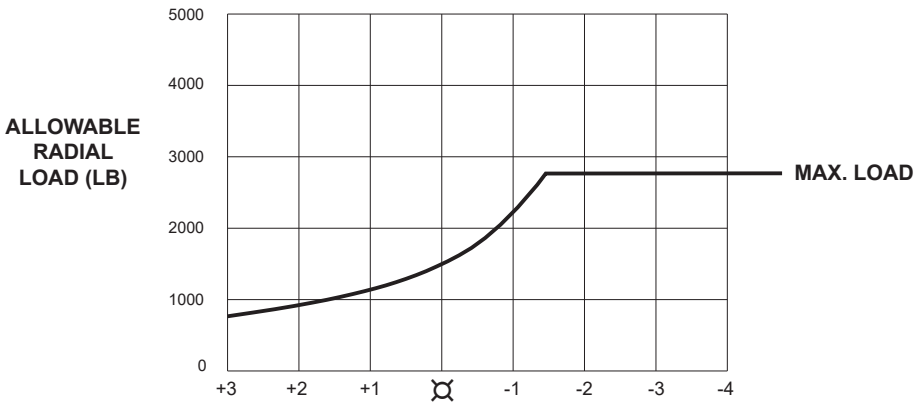
TORQUE

Code	Torque Rating		Initial Release Pressure		Full Release Pressure	
	N·m	(lb·in)	bar	(PSI)	bar	(PSI)
42	475	(4200)	26.9	(390)	31.7	(460)

NOTE: Torque is coded as wet use.

Other torques and/or release pressures are available upon request.

LOAD CAPACITY @ 240 RPM AND B_{10} = 3000 HRS



(Refer to drawing on previous page)

ASSIGNED NUMBERS

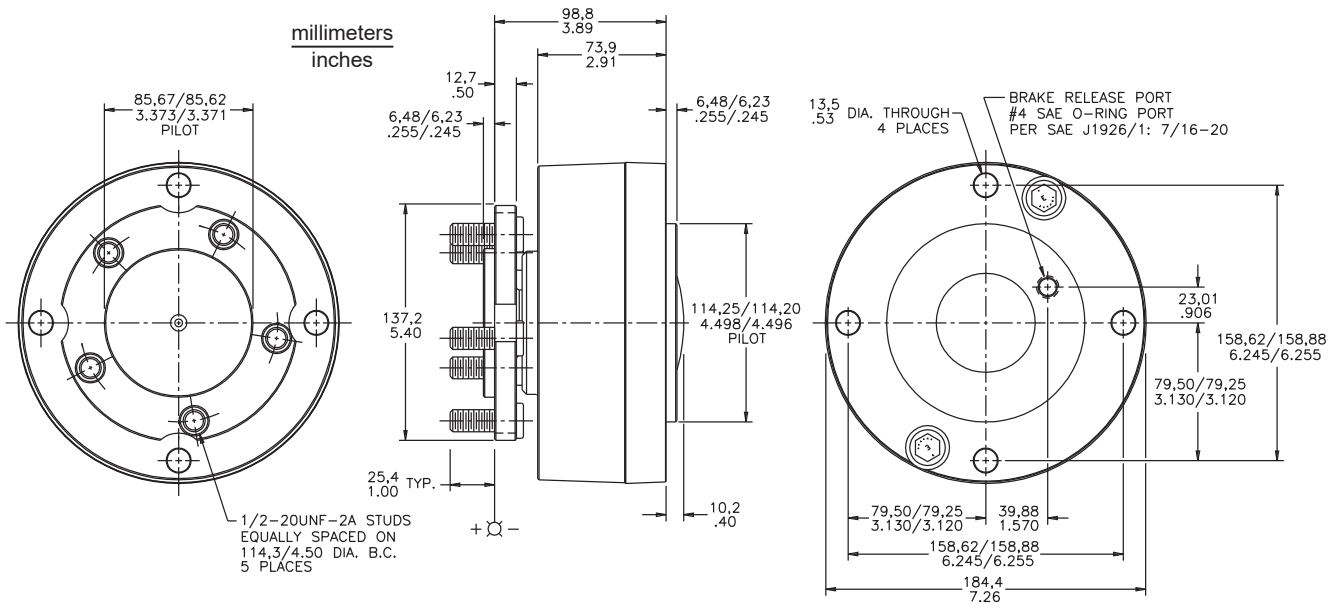
CATALOG CODE	MODEL NUMBER
MW-250642-AP	13-587-086

Compact Wheel Mount Brakes, Closed Input

FEATURES

- Non-metallic type linings
- Provides direct mounting of brake to wheel
- Low release pressures - ideal for use with closed-loop hydrostatic systems
- Full system pressure capability
- Integral hub eliminates the need for an adaptor
- Superior radial wheel load capacities

13-587-072
(MW-054560-R)



SPECIFICATIONS

Torque range at 0 bar (0 PSI) back pressure . . . . . .170 - 1130 N·m (1500 to 10,000 lb·in)
Release pressure range . . . . . 6.9 - 27.6 bar (100 - 400 PSI)
Maximum sustained operating pressure . . . . . 206.8 bar (3000 PSI)
275.8 bar (4000 PSI) intermittent
Maximum speed . . . . . .100 RPM or 200 RPM depending on model
Maximum operating temperature. . . . . 93 °C (200 °F)
Maximum energy input . . . . . 231,000 joule (170,500 ft·lb)

Approximate weight. . . . . 10.4 kg (23 lb)
Volume of oil to release brakes . . . . . 8.2 cm^3 (0.5 in^3) minimum
14.8 cm^3 (0.9 in^3) maximum
Fluid type. . . . . Mineral base hydraulic oil

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

M W – [ ][ ][ ][ ] [ ][ ] – R

MW - MINI WHEEL BRAKE

WHEEL MOUNT CONFIGURATION

0440 = 4-Bolt on 4.00 inch B.C.
0445 = 4-Bolt on 4.50 inch B.C.
0545 = 5-Bolt on 4.50 inch B.C.
2500 = 31.8 mm (1.25 in) Keyed, Taper
5000 = 38.1 mm (1.50 in) Keyed, Taper

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

INPUT FACE

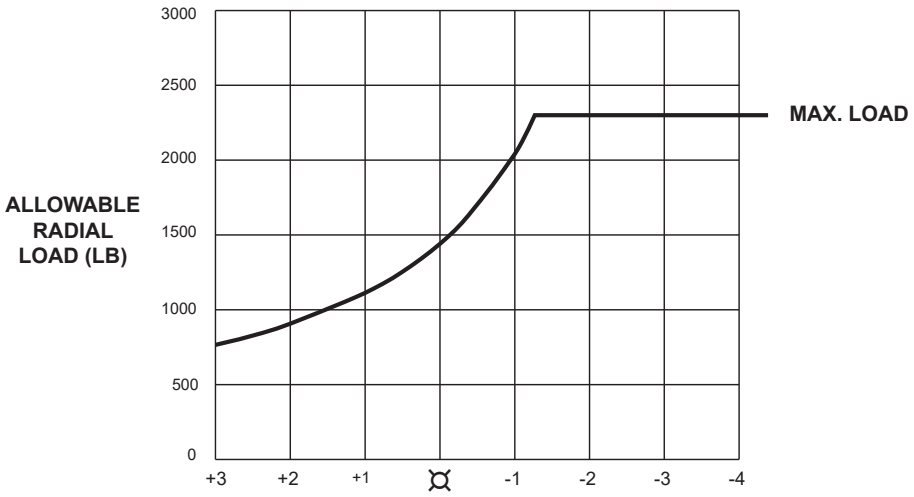
R - Closed Face

TORQUE

Code	Torque Rating N·m	Torque Rating (lb·in)	Initial Release Pressure bar	Initial Release Pressure (PSI)	Full Release Pressure bar	Full Release Pressure (PSI)
90	1017	(9000)	24.1	(385)	29.0	(460)
60	678	(6000)	33.8	(490)	40.0	(580)
51	576	(5100)	25.2	(385)	29.6	(460)
40	452	(4000)	21.0	(335)	24.0	(385)
35	396	(3500)	18.6	(300)	21.0	(340)
25	283	(2500)	16.6	(240)	19.3	(280)
10	1130	(10,000)	25.2	(400)	29.6	(470)

Other torques and/or release pressures are available upon request.

LOAD CAPACITY @ 100 RPM AND B_{10} = 6500 HRS
325 RPM AND B_{10} = 2000 HRS



DISTANCE FROM EDGE OF WHEEL FLANGE (⌑) (INCHES)

(Refer to drawing on previous page)

ASSIGNED NUMBERS

CATALOG CODE	MODEL NUMBER
MW-054535-R	13-587-074
MW-054560-R	13-587-072
MW-054590-R	13-587-082
MW-500051-R	13-587-080

THRUST LOAD CAPACITY:

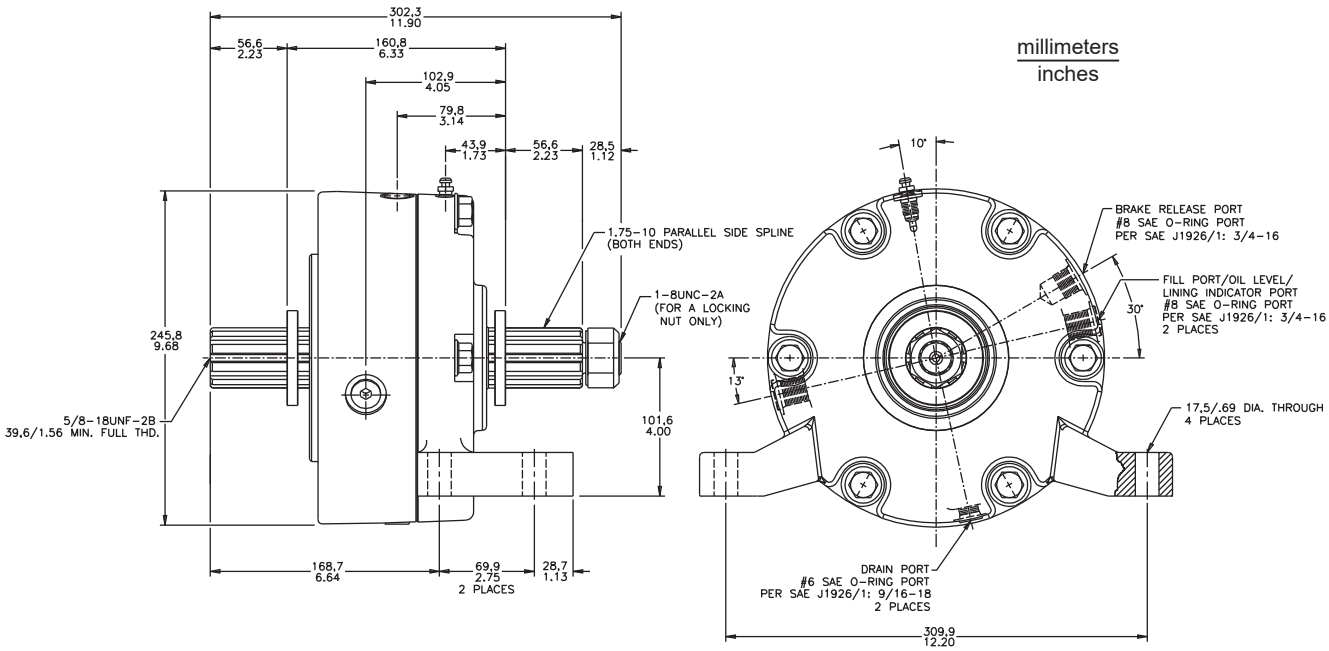
300 lb max. @ 100 RPM & 2000 hrs B_{10} life. (Based on constant 290 lb side-load at edge of wheel flange)

Driveline
Multiple Disc Brakes

FEATURES

- Enclosed/sealed wet design
- Tapered roller bearings for high radial and thrust loads
- Metallic linings provide high energy and long life
- Isolation from environmental contaminants
- Developed to retrofit competitive drum/ caliper driveline parking brakes
- Lining wear indicator port

02-560-104
(DB-757518)



SPECIFICATIONS

Type . . . . . Wet multiple disc brake, spring apply, hydraulic release
Release pressure for 2034 N·m (18,000 lb·in) version . . . . . 18.6 bar (270 PSI) initial
22.4 bar (325 PSI) full
137.9 bar (2000 PSI) maximum (continuous)
Release pressure for 2825 N·m (25,000 lb·in) version . . . . . 24.1 bar (350 PSI) initial
29.0 bar (420 PSI) full
137.9 bar (2000 PSI) maximum (continuous)
Torque Rating . . . . . 2034 N·m (18,000 lb·in) static (breakaway)
2825 N·m (25,000 lb·in) static (breakaway)
Volume of oil required to release brake . . . . . 32.8 cm^3 (2 in^3)
Sump cooling fluid volume . . . . . 236.6 mL (8 fl. oz.)
Maximum speed . . . . . 3200 RPM
Maximum energy input . . . . . 1,654,000 joule (1,220,000 ft·lb)
Approximate weight . . . . . 42 kg (92 lb)
Fluid type . . . . . Mineral base hydraulic oil

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

DB - DRIVELINE BRAKE

OUTPUT SHAFT / INPUT SHAFT

75/75 = 1.75 inch Diameter 10B Parallel Spline-External
50/50 = 1.50 inch Diameter 10B Parallel Spline-Internal (through-shaft)

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

TORQUE

Code	Torque Rating N·m	(lb·in)	Initial Release Pressure bar	(PSI)	Full Release Pressure bar	(PSI)
25	2825	(25,000)	24.1	(350)	29.0	(420)
18	2034	(18,000)	18.6	(270)	22.4	(325)

NOTE: Torque is coded as wet use.

Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

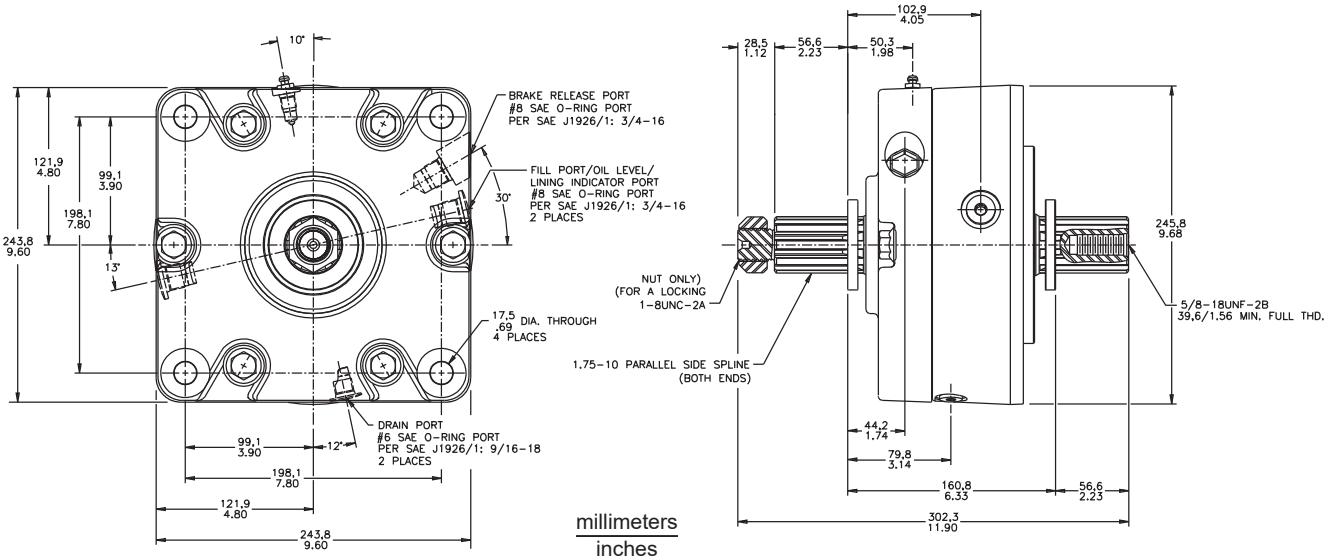
CATALOG CODE	MODEL NUMBER
DB-505018	02-560-108
DB-505025	02-560-110
DB-757518	02-560-104
DB-757525	02-560-106

Driveline Multiple Disc Brakes, Through Mount

FEATURES

- Enclosed/sealed wet design
- Tapered roller bearings for high radial and thrust loads
- Metallic linings provide high energy and long life
- Isolation from environmental contaminants
- Developed to retrofit competitive drum/ caliper driveline parking brakes
- Lining wear indicator port

02-560-118
(DBT-757525)



SPECIFICATIONS

Type . . . . . Wet multiple disc brake, spring apply, hydraulic release
Release pressure . . . . . 24.1 bar (350 PSI) initial
29.0 bar (420 PSI) full
137.9 bar (2000 PSI) maximum (continuous)
Torque Rating . . . . . 2825 N·m (25,000 lb·in) static (breakaway)
Volume of oil required to release brake . . . . . 32.8 cm^3 (2 in^3)
Sump cooling fluid volume . . . . . 236.6 mL (8 fl. oz.)
Maximum speed . . . . . 3200 RPM
Approximate weight . . . . . 42 kg (92 lb)
Fluid type . . . . . Mineral base hydraulic oil

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

DBT - DRIVELINE BRAKE THROUGH MOUNT

OUTPUT SHAFT / INPUT SHAFT

75/75 = 1.75 inch Diameter 10B Parallel Spline-External

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

TORQUE

Code	Torque Rating		Initial Release Pressure		Full Release Pressure	
	N·m	(lb·in)	bar	(PSI)	bar	(PSI)
25	2825	(25,000)	24.1	(350)	29.0	(420)

NOTE: Torque is coded as wet use.

Other torques and/or release pressures are available upon request.

ASSIGNED NUMBERS

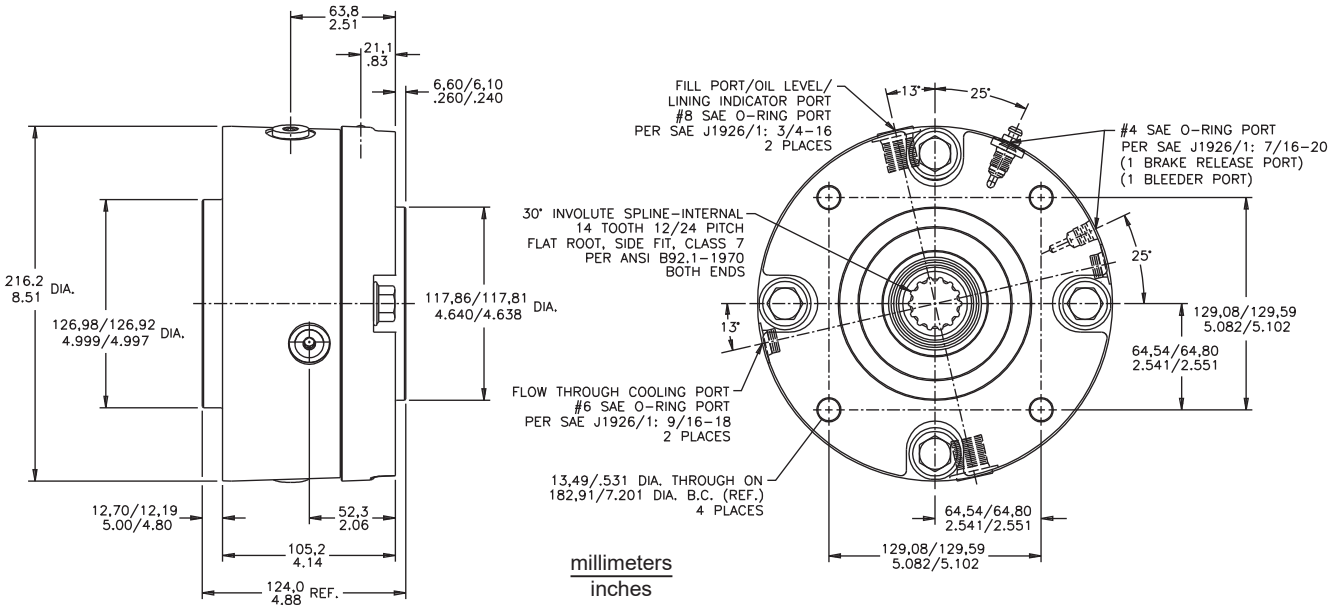
CATALOG CODE	MODEL NUMBER
DBT-757525	02-560-118

Driveline Multiple Disc Brakes, Through Mount Compact

FEATURES

- Enclosed/sealed wet design
- Tapered roller bearings for high radial and thrust loads
- Metallic linings provide high energy and long life
- Isolation from environmental contaminants
- Developed to retrofit competitive drum/ caliper driveline parking brakes
- Lining wear indicator port

02-560-116
(DB-141412)



SPECIFICATIONS

Type . . . . . Wet multiple disc brake, spring apply, hydraulic release
Release pressure . . . . . 17.9 bar (260 PSI) initial
24.1 bar (350 PSI) full
137.9 bar (2000 PSI) maximum (continuous)
Torque Rating . . . . . 1356 N·m (12,000 lb·in) static (breakaway)
Volume of oil required to release brake . . . . . 32.8 cm^3 (2 in^3)
Sump cooling fluid volume . . . . . 236.6 mL (8 fl. oz.)
Maximum speed . . . . . 3200 RPM
Approximate weight . . . . . 24 kg (53 lb)
Fluid type . . . . . Mineral base hydraulic oil

CATALOG CODE (See NOTE on the top of page 6)

Not all of the brake combinations are possible due to certain design limitations.

DBTC - DRIVELINE BRAKE THROUGH MOUNT COMPACT

OUTPUT SHAFT / INPUT SHAFT

14/14
35/35

SAE Designation
14 = 14T 12/24 (internal)
35 = 35T 24/48 (internal)

75/75 = 1.75 inch Diameter 10B Parallel Spline-External

For other configurations, consult a ZF Off-Highway Solutions Minnesota Inc. specialist.

TORQUE

Code	Torque Rating		Initial Release Pressure		Full Release Pressure	
	N·m	(lb·in)	bar	(PSI)	bar	(PSI)
12	1356	(12,000)	17.9	(260)	24.1	(350)

NOTE: Torque is coded as wet use.

Other torques and/or release pressures are available upon request.

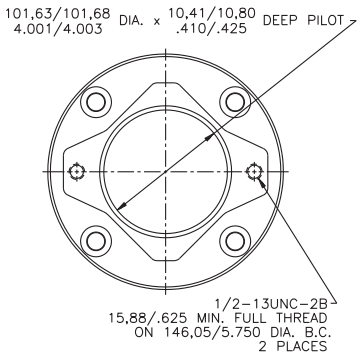
ASSIGNED NUMBERS

CATALOG CODE	MODEL NUMBER
DBTC-141412	02-560-116
DBTC-353512	02-560-124

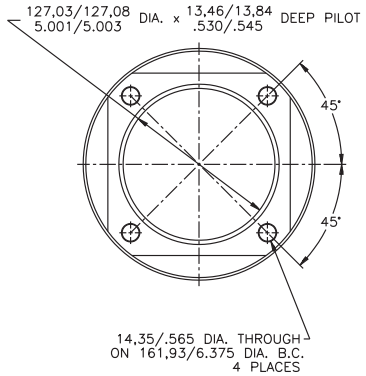
Input Face Dimensional Information

Reference for Page 13

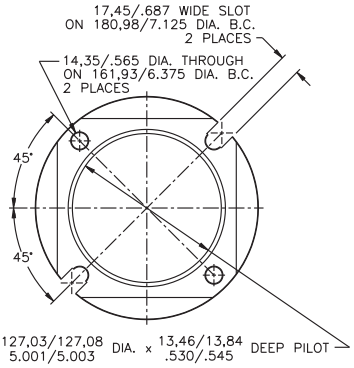
millimeters
inches



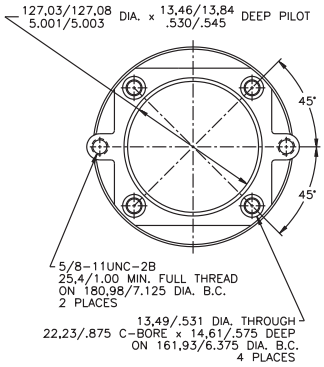
B - SAE B-Mount 2-Bolt



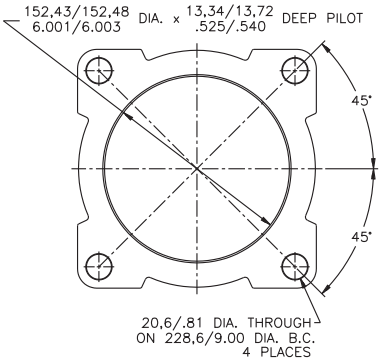
C - SAE C-Mount 4-Bolt



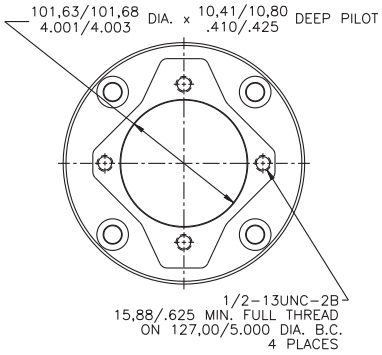
C2 - SAE C-Mount 2-Bolt Through



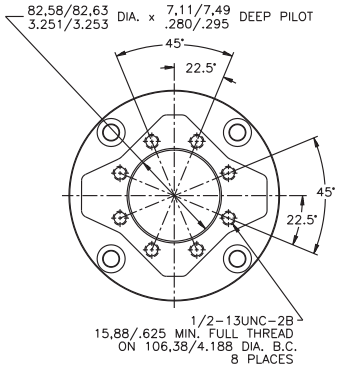
C24 - 2-Bolt and 4-Bolt C-Mount



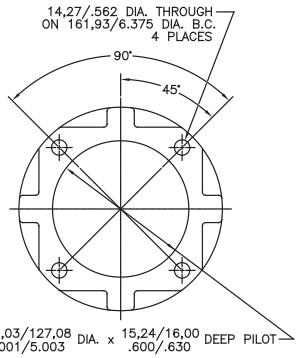
D - SAE D-Mount



K4 - Eaton Standard 4000



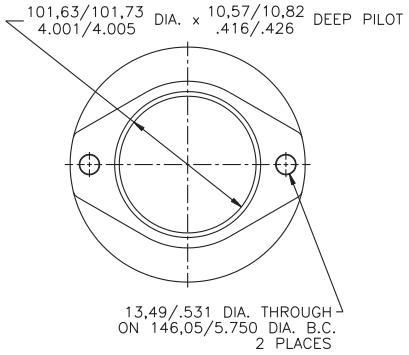
M - 4-Bolt and SAE A-Mount 2-Bolt



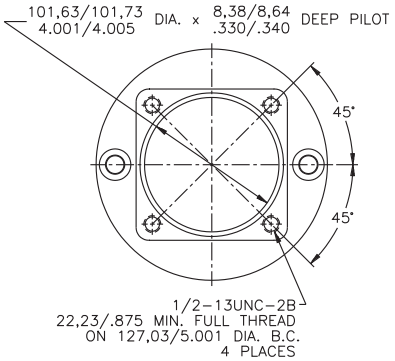
L4 - Eaton Bearingless 4000

Reference for Page 19

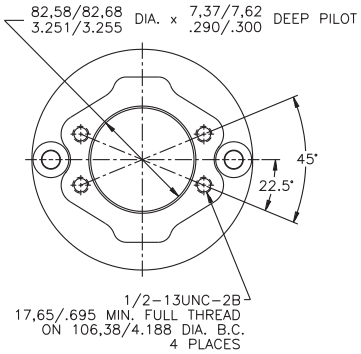
millimeters
inches



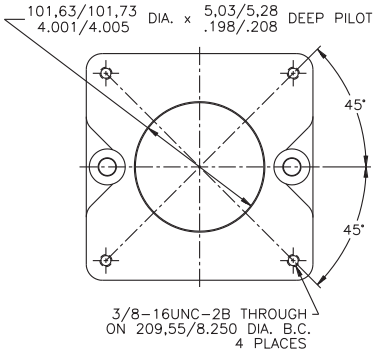
B - SAE B-Mount 2-Bolt



L2 - Eaton Bearingless 2000



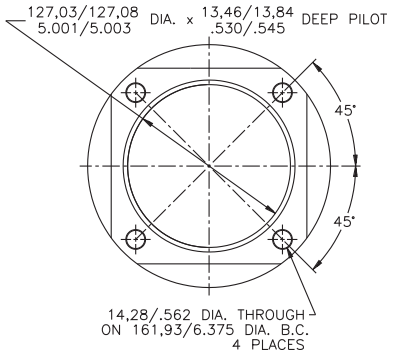
M - Modified SAE A-Mount 2-Bolt



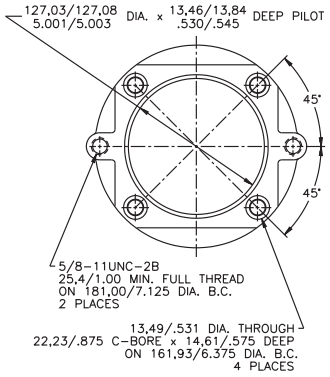
N - NEMA Mount

Reference for Page 27

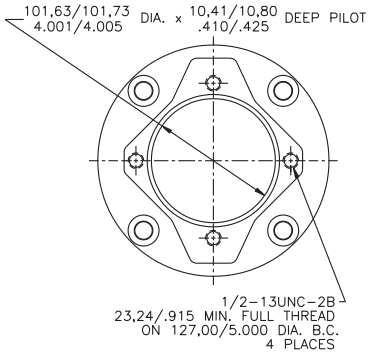
millimeters
inches



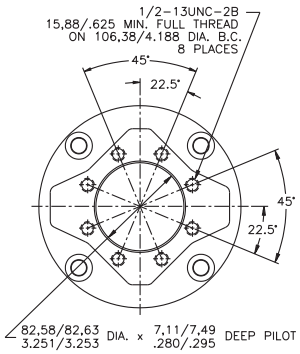
C - SAE C-Mount Standard



C24 - 2-Bolt and 4-Bolt C-Mount



K4 - Eat Standard 4000

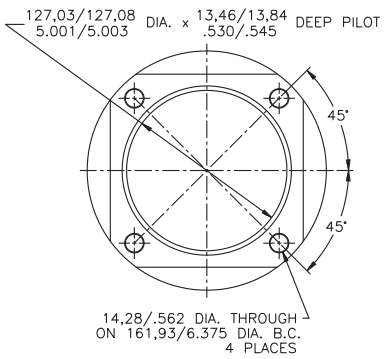


M - 4-Bolt and SAE A-Mount 2-Bolt

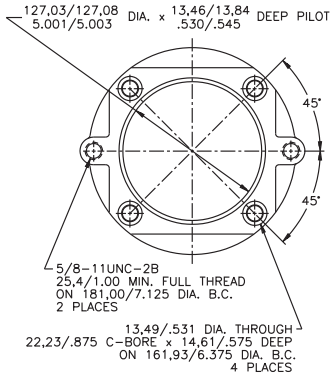
Input Face Dimensional Information

Reference for Page 31

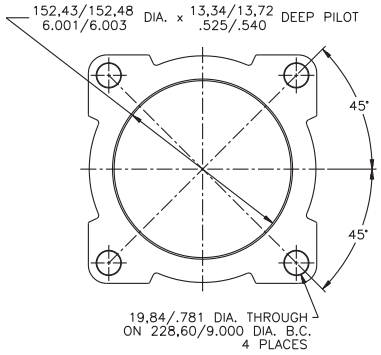
millimeters
inches



C - SAE C-Mount Standard

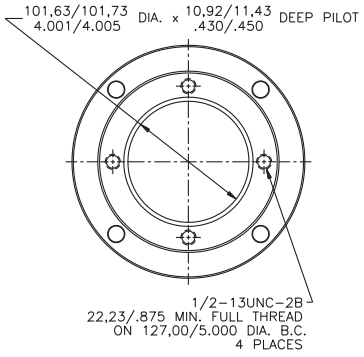


C24 - 2-Bolt and 4-Bolt C-Mount

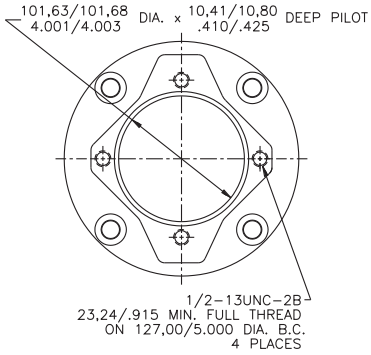


D - SAE D-Mount

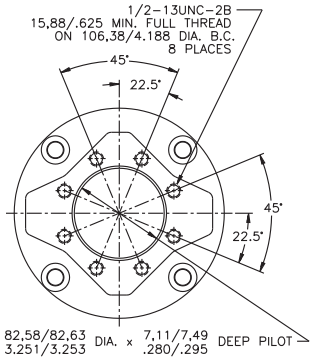
Reference for Page 33



K4 - Eaton Standard 4000

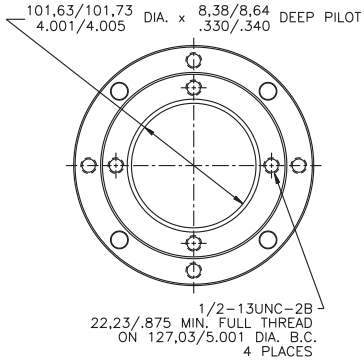


K4 - Eaton Standard 4000

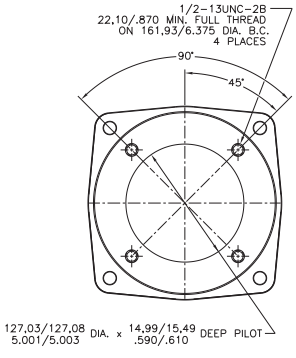


M - 4-Bolt and SAE A-Mount 2-Bolt

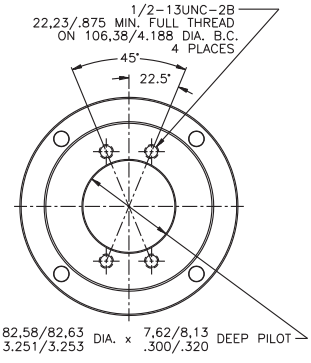
millimeters
inches



L2 - Eaton Bearingless 2000



L4 - Eaton Bearingless 4000



M - 4-Bolt and SAE A-Mount 2-Bolt

NOTES

About ZF Friedrichshafen AG

ZF is a global technology company supplying systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility.

ZF allows vehicles to see, think and act. In the four technology domains of Vehicle Motion Control, Integrated Safety, Automated Driving, and Electric Mobility, ZF offers comprehensive product and software solutions for established vehicle manufacturers. Learn more at ZF.com.

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