Dependable torque control products

Wichita clutches and brakes provide the high speed acceleration and deceleration that are essential in modern process equipment. They are available in a variety of designs and mounting configurations and are used extensively around the world by leading OEM's in metalworking, steel, pulp/paper, material handling, paper converting, mining and energy.

Wichita provides custom designs to meet your particular application requirements, giving you the right solution to meet all your power transmission needs.

General Warnings

Do not repair clutches and brakes (with or without a guard) while they are rotating or with a load engaged.

Do not disassemble while air-tube is pressurized.

Heavy components should be handled carefully. If dropped they can cause serious bodily injury.

Caution, clutches and brakes generate heat. Allow cooling time before normal maintenance.

Do not exceed the recommended maximum air-pressure listed in the Specification Table for each type of unit.

Do not operate clutches and brakes without a guard.

Internal springs under compression. Please refer to installation and maintenance manuals for proper disassembly procedures.

Disable all power sources (electrical, pneumatic, mechanical, etc.) before servicing equipment.

Consult Wichita Installation and Maintenance manuals for proper disassembly and assembly procedures.

Wichita clutches and brakes are designed to be operated with original Wichita replacement parts. Using non-original replacement parts in Wichita clutches and/or brakes voids all warranties issued by Dana Corporation. Dana also specifically disclaims any responsibility for damage to persons or property which may be related to the use of said brakes and clutches which employ non-original parts.

Contents

Customer Service

For over 50 years Wichita Clutch has provided engineered solutions to the most demanding torque control problems.

Founded in 1947, Wichita Clutch began manufacturing air-tube disc clutches and brakes. Today, we are recognized as a global leader in heavy-duty power transmission.

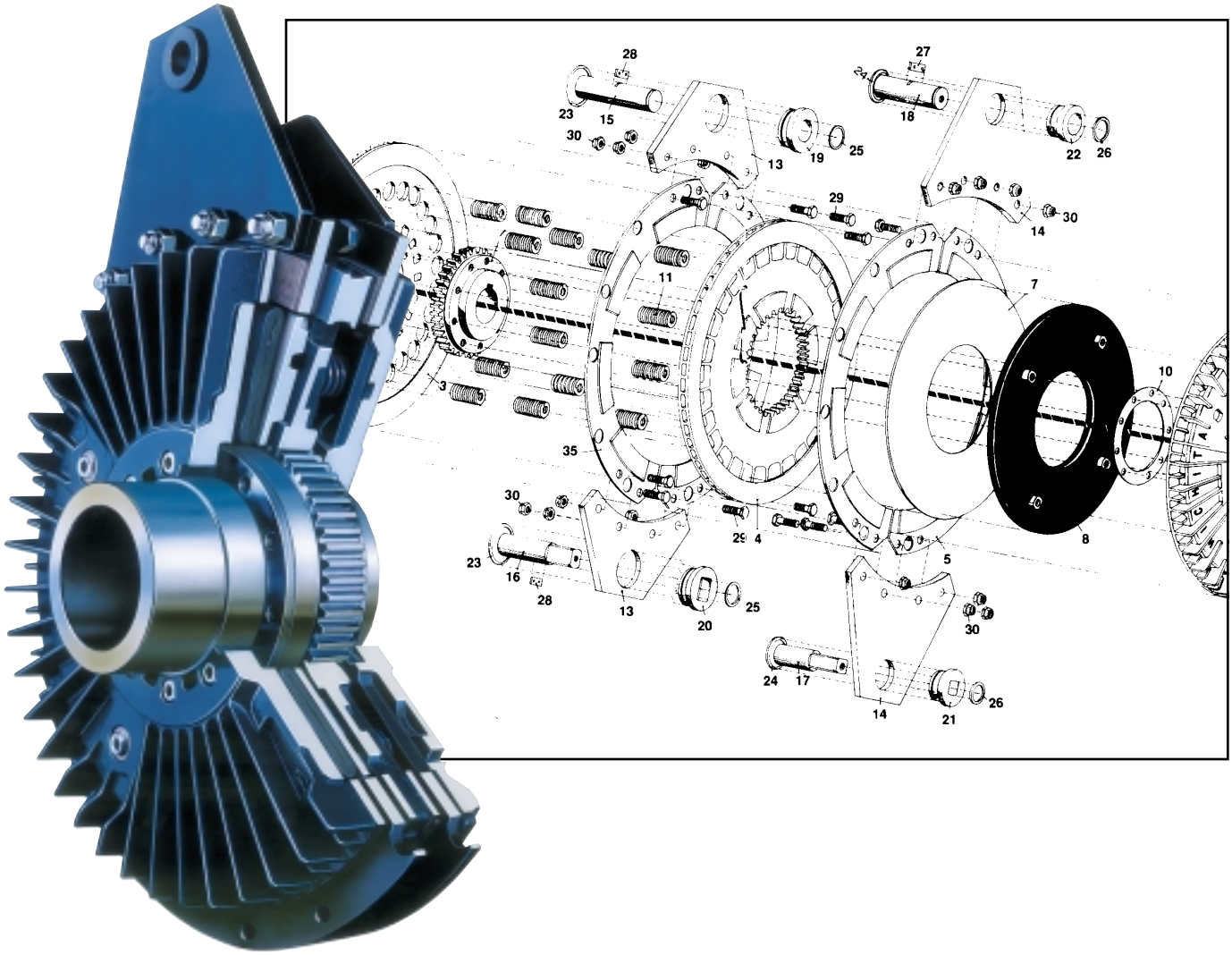
Total Support

Superior customer service is a common denominator at Wichita Clutch. It is this philosophy that places the needs of our customers at the central focus of our efforts. By adopting Just-in-Time (JIT) scheduling, our customers receive the products they require precisely when needed. And our computerized order entry systems allow quick and timely answers to your questions. A national distributor network puts local Wichita specialists only a phone call away.

Assured quality

Wichita Clutch has instituted quality assurance procedures aimed at achieving the ultimate in product reliability. We employ sophisticated Statistical Process Control (SPC) programs to ensure product consistency. Working within our cellular manufacturing structure, every worker is responsible for maintaining unvarying product quality. Our conformity to specifications is your performance guarantee.

Wichita Clutch Plant
Wichita Falls, Texas



Engineering

Wichita has dedicated significant resources and talented people to the numerous engineering disciplines required to design, manufacture and apply our heavy duty clutches and brakes. Our application engineers provide timely response to your inquiries with our Computer Aided Product Selection (CAPS) system.

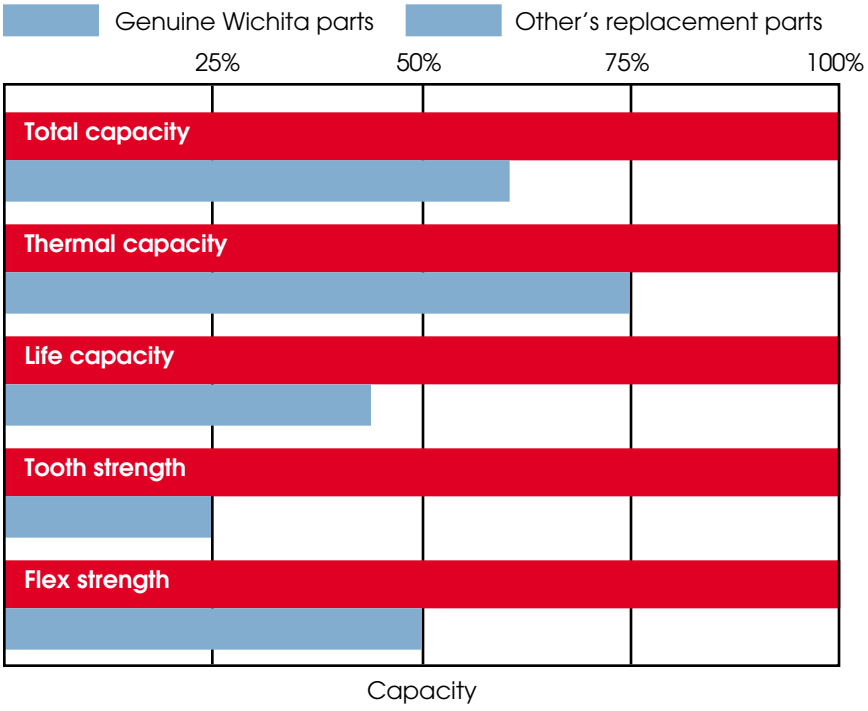
Our product engineers utilize the latest CAD equipment in the design of new products. Our dedication to emerging technologies has allowed us to solve the most challenging applications in heavy-duty power transmission.

The simple air-tube disc clutch design allows for greater torque capacity in multiple plate units at less pressure than drum clutch designs. Years of engineering development have produced a variety of designs used extensively by leading OEM's in all major heavy duty applications.

Authorized distributors providing the experience to know just what to replace and how to do it might be the difference between getting your machine up and running fast.

Your application benefits from Wichita research and development and quality control. Consistency in material and quality gives longer life in friction discs and airtubes for replacement peace of mind.

Comparison Chart



Genuine Wichita replacement parts

Features no one else can match!

Friction Discs

Special high strength proprietary materials with molded composite teeth resist functional wear and provide additional output torque.

Friction material provides longer life and more consistent operation due to continuous research and development and quality control.

- Friction disc match exactly the mating Wichita components for consistent and maximum high torque output.
- High strength for dependable, long life service.
- Higher heat resistance to combat unforeseen application problems.
- Consistent size for ease of replacement.
- Wear resistance polymers insure compatibility with other Wichita parts.
- Air grooves to provide cooling and longer life.

Airtubes

Combination space age fibers and elastomerics give extended life and fit assurance. Wichita airtubes are trouble free and easy to replace. A "Long Stroke" airtube is available on selected models to provide extended service life.

- Controlled quality manufacture insures long life and trouble free service.
- All genuine Wichita Airtubes are trade marked in mold.
- Consistent size allows ease of replacement if required.
- Low air volume construction reduces needless use of compressed air and reduces start/stop times.

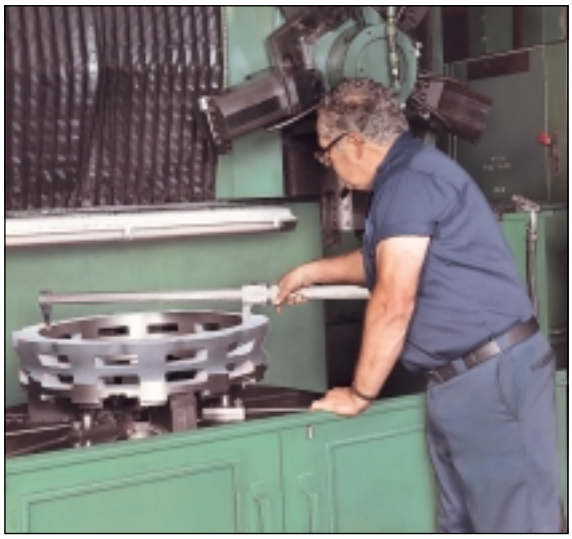
- When used in combination with other Wichita parts, the Wichita airtube sustains its heat resistance to insure long operating life in conditions unacceptable to other power transmission devices.
- Wichita split airtubes are available to replace full circle airtubes for emergency operation of needed equipment.
- Wichita maintains a trade mark part number and serial number system molded into the surface of Wichita airtubes for easy identification of genuine Wichita parts.

Quality Assurance

Continuous Process Improvements through Total Quality Commitment…Computer controlled machining equipment insures precision tolerances for durability and consistent performance.

Technical Backup

Comprehensive, technical information published on all our products is available to our customers, including complete dimensional drawings, performance curves, exploded part drawings, helpful application engineering data, and complete service/installation manuals. Using genuine Wichita parts assures you of the most knowledgeable technical support in the industry.



Available Now!

A nationwide network of service oriented, technically trained, authorized Wichita distributors will promptly serve your replacement part needs.

Your Wichita distributor

Your Wichita distributor is a power transmission specialist. Because he's your distributor, he has an understanding of your total power transmission system needs. And since he represents Wichita, he can put together the best possible system from the very best components to satisfy your requirements.

Your Wichita distributor, backed by factory regional sales engineers, is near enough to visit your plant to see your problems first hand. He's big enough to find the parts you need on his own shelves, eliminating the time lost while a part is shipped direct. He's experienced enough to make sure the parts he sells are right and perform as promised.

Your Wichita distributor represents your needs to his suppliers. His first commitment is to keep your plant in operation…getting it back in operation as quickly as possible after trouble strikes…maximizing your productivity.

Your Wichita distributor is just as important to Wichita as he is to you. That's why we put a great deal of emphasis on training. His "on-the-spot" knowledge is our assurance that you'll benefit in your plant from all the performance features we build into our products.

The Wichita difference… local availability

Friction discs and airtubes are available off-the-shelf from Wichita distributors throughout the United States and Canada. Wichita distributors are power transmission specialists offering local stock, local service and local on-the-spot application assistance.

Selection Guide

Application Factors

To determine the best Wichita clutch or brake for your application:

1. Decide which of the four possible functions you wish to perform.
2. Choose the mounting arrangement best suited to your application.
3. In the Function/Mounting chart below, choose the proper type of mounting (1,2,3, etc.) to make a preliminary product selection. (Consult your Wichita representative for final product selection.)

Wichita Product	Page No.	Function/Mounting Condition				
		Controlled Acceleration Provide smooth acceleration of a load.	**Cycling** Accurately positions a load in a repeatable fashion.	**Controlled Deceleration** Provides a smooth, cushioned deceleration of a load.	**Controlled Slip** Provide continuous tension to a web or strand.	
					High Heat	Low Heat
Combination Clutch/Brake	10		7, 8, 9			
Very Low Inertia Clutch or Brake	30	1, 2	1, 2	1, 2, 3		1, 2, 3
Low Inertia Clutch or Brake	30	1, 2	1, 2	1, 2, 3		1, 2
High Torque Clutch	40		1	1		1
Spring-Set Air Release Brake	52		1, 2, 3	1, 2, 3		
Kopper Kool Clutch or Brake (Tensioning)	61	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	
Water Cooled Clutch or Brake (Tensioning)	70	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	
Magnum Brake* (Tension Brakes)	81					1, 2, 3
Extra Performance Brake (Tension Brakes)	86					1, 2, 3
Mistral Brake* (Tension Brakes)	92					2
Motor Brake	106			2, 6		
Standard Vent Coupling Clutch	114	3, 4				
Standard Vent Grinding Mill Clutch	126	3, 4				
Power Take-Off Clutch	132	5				

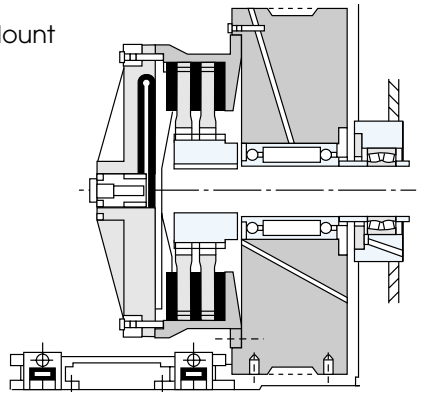
*Available with integral fan and housing

Types of Mounting (see page 7)

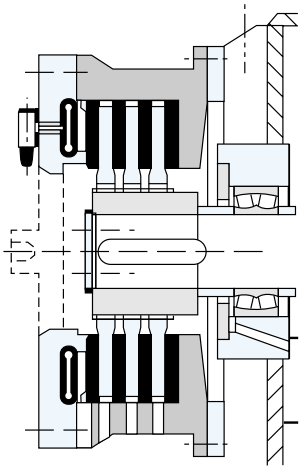
1 Indirect Mount
2 Direct Mount
3 Through Shaft
4 Shaft-to-Shaft
5 Engine Mounted
6 Brake Mount Electric Motor
7 Ring to Extended Pin
8 Pin to Pin, Ring to Pin, Ring to Ring
9 Pin to Extended Pin

Type of mounting

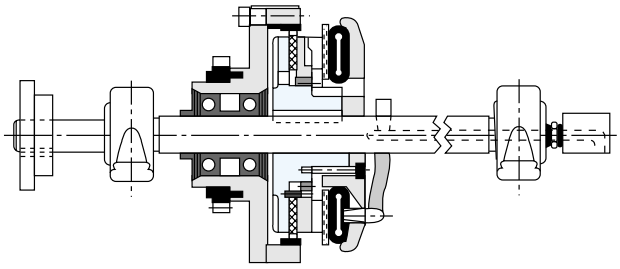
1 Indirect Mount



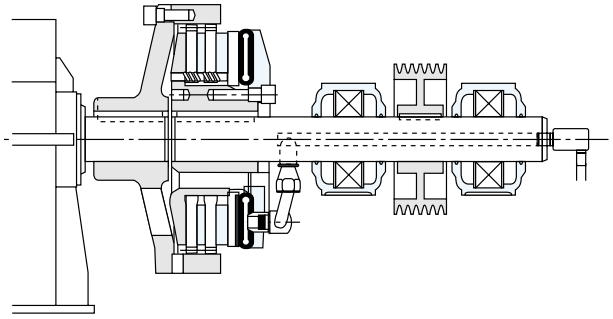
2 Direct Mount



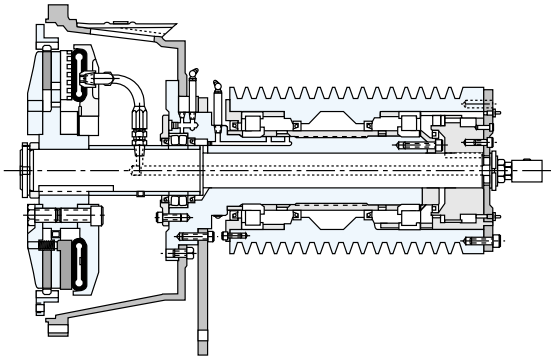
3 Through Shaft, Inboard Mount Clutch



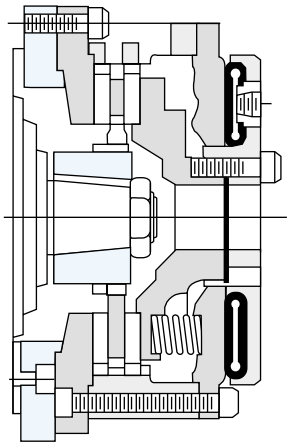
4 Shaft-to-Shaft In-line (clutch-coupling)



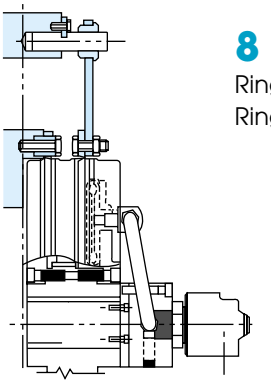
5 Engine Mount (PTO) Clutch



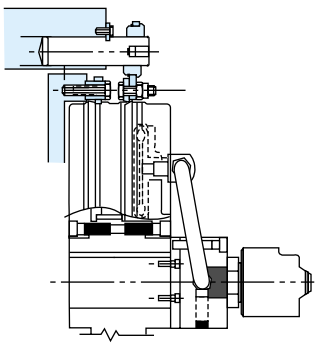
6 Electric Motor C-Face or Foot Mount Brake



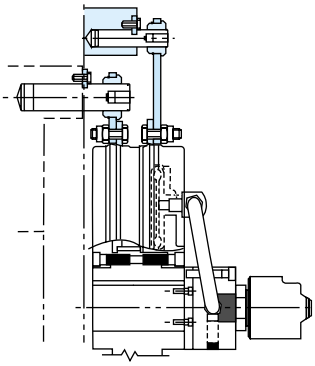
7 Ring to Extended Pin



8 Pin to Pin, Ring to Pin, Ring to Ring



9 Pin to Extended Pin



Pneumatic Combination Clutch Brake

Selection Guide

Application Factors

Clutch/Brake sizes are affected by the following variables:

1. Machines that operate under smooth loads require smaller clutch/brakes. These machines are driven by either multi-cylinder high speed engines or electric motors with reduced starting current.
2. Drives that require high starting current motors will require clutch/brakes with sufficient torque to prevent excessive slipping while starting.
3. Starting torque may be high, which requires a fast clutch/brake response time to transmit the required torque or extended clutch/brake slip time is required to protect the prime mover.
4. Starting torques may be very low compared to the normal torque which may result in the clutch/brake not being fully pressurized prior to the time of torque requirement. This will cause the clutch/brake to over heat from slippage. Clutch/brake inflation time in this instance is very important.
5. Clutch/brakes on most machines are designed to slip prior to damage from shockloads. As a result, the clutch/brake may require periodic maintenance; therefore the clutch/brake should be located in the power train for easy access. Clutch/brakes should also be located for maximum cooling air. In instances where this is not possible, forced air cooling may be desirable to extend clutch/brake life.
6. Safe operating speeds for clutch/brakes should be maintained in design. The following material specifications are recommended for safe operation. The maximum speeds shown are safe operating speeds based upon years of Wichita experience.

Maximum Clutch/Brake Contact Velocity FPM	Material
6,000 (Recommended upper limit for slip)	cast iron
9,000	ductile iron
12,000	steel

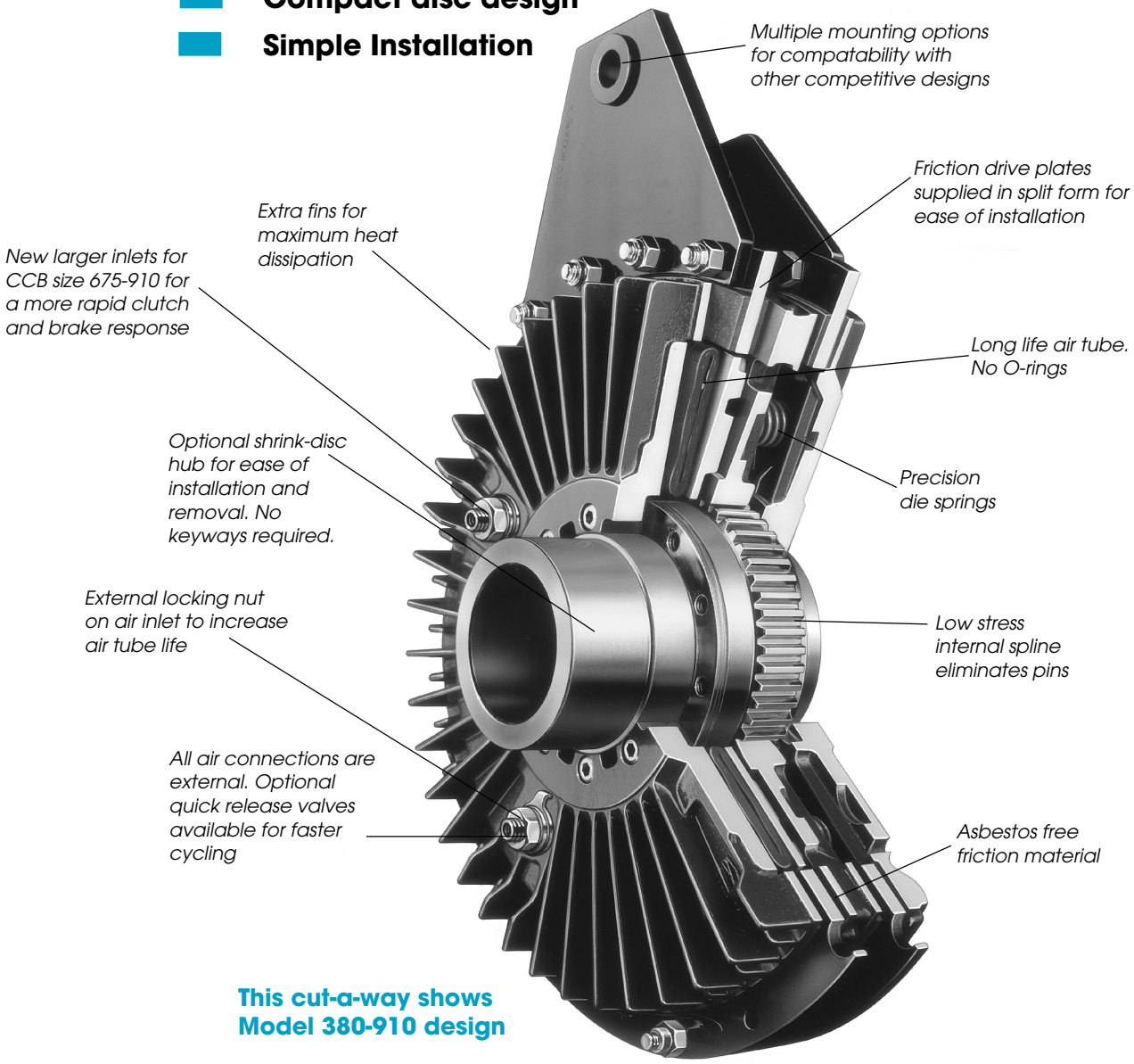
Dynamic balancing recommended when peripheral speeds exceed 3500 fpm. These velocities are measured at the nominal outside diameter of the clutch/brake plate.

Field of Application	Machine or Equipment	Wichita Product														
			Air Tube Disc Clutches & Brakes				Tension Brakes					Spring-Set Motor Brakes	Standard Vent Clutches		Power Take Off	Mesur-Fil Couplings
		Combination C/B	Very Low Inertia	Low Inertia	High Torque	Spring-Set	Kopper Kool	Water Cool	Magnum	Mistral	EP		Coupling	Ball Mill		
Air Movement Pumps	Centrifugal compressors			•	•								•			
	Reciprocating compressors (over 2 cylinders)			•	•								•			
	Reciprocating compressors (1 or 2 cylinders)			•	•								•			
	Centrifugal fans Blowers			•	•								•			•
Agitators	Liquid Semi-solid Solids			•	•								•			
Brick manufacturing	Brick press		•	•		•							•			
	Extruder Pug mill			•	•								•			
Canning & bottling machine	Bottle-can feeders Filling		•	•	•											
	Mixers			•	•								•			•

Field of Application	Machine or Equipment	Wichita Product														
			Air Tube Disc Clutches & Brakes				Tension Brakes						Standard Vent Clutches			
		Combination C/B	Very Low Inertia	Low Inertia	High Torque	Spring-Set	Kopper Kool	Water Cool	Magnum	Mistral	EP	Spring-Set Motor Brakes	Coupling	Ball Mill	Power Take Off	Mesur-Fil Couplings
Engine driven equipment	Crane			•		•						•	•			
	Hoist			•									•			
	Engine														•	
	Crowd			•									•			
Grinding mills	Ball-rod-sag-pebble													•		
	Crushers													•		
	Shakers													•		
Lumber processing	Yarder		•	•	•		•	•								
	Carriages, conveyers Chipper, logger		•	•	•		•	•								•
Marine	Propulsion clutch CP wheel			•									•			
	Shaft brakes			•												
	Propulsion reversing type			•									•			
	Anchor winch			•									•			
Bulk material handling	Conveyors evenly loaded	•		•	•	•							•			•
	Line shaft evenly loaded			•	•	•							•			
	Feeders			•	•	•							•			
	Elevators			•	•	•							•			
Metal production & metalforming	Coilers		•	•			•	•					•			
	Slitters	•	•	•	•	•	•	•								
	Press brake	•	•	•	•	•		•					•			
	Non-geared press	•	•	•	•	•		•					•			
	Geared press	•	•	•	•	•		•					•			
	Draw bench		•	•		•							•			
	Rolling mill		•	•									•			
	Shear	•	•	•	•	•		•					•			
	Back geared press	•	•	•	•	•		•					•			
	Hammer Mill			•		•							•			
	Forging			•		•							•			
Paper industry dryer sections & calenders consult factory	Fourdrinier to 500 FPM Fourdrinier to 1800 RPM Paper mill plane Smoothing press Press selections Dryers Calenders			•		•							•			
Petroleum production	Drilling & service rig			•									•			
	Master clutches			•									•			
	Compound clutches			•									•			
	Rotary Drum			•									•			
	Mud pumps												•		•	
	PTO clutches												•		•	
Rubber manufacturing	Transfer machines evenly loaded Banberry mixer Drum mixer Extruder Calender Centrifuge			•									•			

Combination Clutch/Brake

- **For metalforming equipment**
- **Fast, smooth cycling**
- **Cool running with higher torque**
- **Compact disc design**
- **Simple Installation**



This cut-a-way shows Model 380-910 design

The Wichita combination Clutch-Brake provides fast, smooth cycling for stamping presses and metalforming equipment. The simple Wichita air tube concept combines an air actuated clutch and a spring-set brake in a compact disc design.

Design Advantages

- No shaft seals for faster, lower cost installation
- Optional shrink disc mounting for simplified, easier installation
- Cool running for faster cycle rates, higher torques
- Models 380-910 have a single air-tube design that provides long life and high reliability

Operation

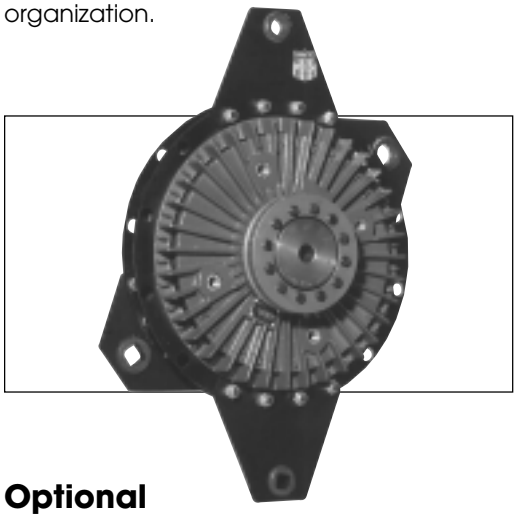
The Wichita Combination Clutch/Brake provides fast, smooth cycling for stamping presses and metalforming equipment.

The simple air-tube concept combines an air actuated clutch and spring-set brake in a compact, pancake assembly that prevents overlap. The extra fins and cooling slots allow for excellent heat dissipation. A low stress spline eliminates driving pins between the shaft and centerplate, while the precision die springs provide consistent long-life braking action.

The high performance air-tube design in sizes 380 and above, with optional quick air-release valves, provides faster cycling than piston and cylinder models. There are no o-rings or piston seals to wear-out and leak and no lubrication or adjustment is necessary. Worn friction plates can be relined at Wichita's factory on an exchange basis.

Installation of the CCB is also easy. The simple air system has external connections and requires no shaft seals. Metric mounting and SAE fasteners are standard. Available in eight sizes with an optional hub for shrink disc mounting. Clutch capacities through 340,000 lb/in and brake torque through 250,000 lb/in.

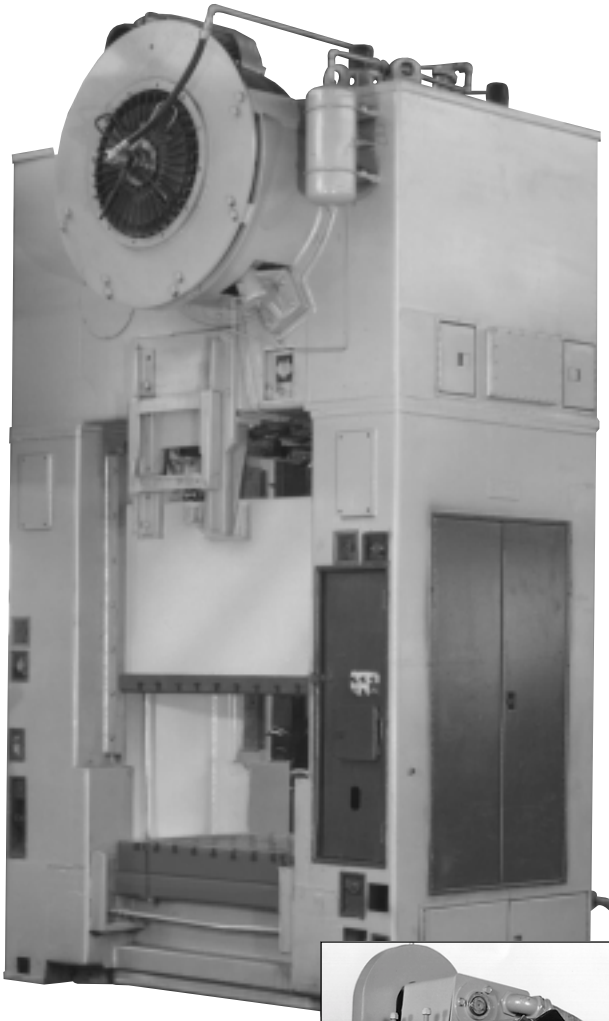
Wichita Combination Clutch/Brakes are manufactured and assembled in the United States and backed by a global sales, service and distributor organization.



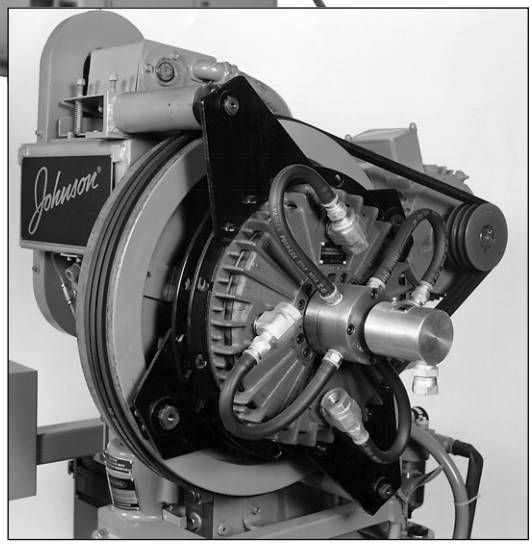
Optional

Optional shrink disc hub provides ease of mounting with no keyways.

Typical Applications



Wichita CCB is ideal for retrofit applications.

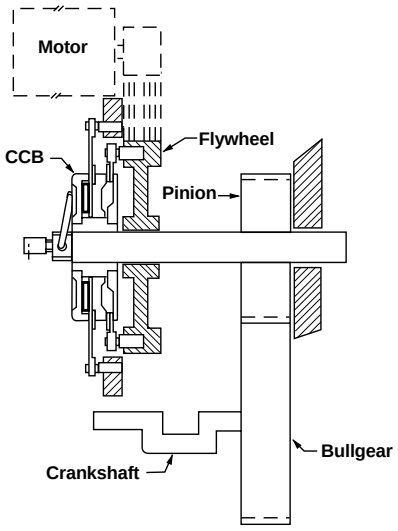


The simple external air system with quick release valves provides smooth, fast cycling.

Combination Clutch/Brake

Clutch/brake selection

A typical Combination Clutch/Brake application would be on a single backshaft press. To properly select a CCB the following application information is needed.



Application Data

Rated Tonnage	200 tons
Crankshaft Speed	30 rpm
Degrees of Crank to Start	90°
Distance Off Bottom – x	.25 in.
1/2 of Press Stroke (throw) = a	3 in.
WR^2 of Parts on Backshaft	78 lb.ft.^{2}
Required Clutch Torque	73,529 lb.in.
Stroke	6 in.
Clutch/Brake Shaft	204 rpm
Degrees of Crank to Stop	120
Connecting rod length = b	36 in.
WR^2 of Parts on Crankshaft	39,091 lb.ft.^{2}
Cycles/Minute	7
Air Pressure Available	100 psi
Shaft Size	4.5 in.

Selection

Press clutch and brake selection is based on:

1. Application clutch torque.
2. Application brake torque necessary to stop.
3. Heat generated during cycling.
4. Bore size.

1. To determine the application clutch torque, the following information is needed:

   a. Torque @ Crank
   = (Rated Tonnage) (2000 lb./ton) (Torque Arm)

   b. Torque Arm = y = (c) (tan a)
   c = a + b - x
   = 3 + 36 - .25
   = 38.75 in.

$$\text{Cos } \alpha = \frac{b^2 + c^2 - a^2}{2bc}$$

$$= \frac{(36)^2 + (38.75)^2 - (3)^2}{(2)\ (36)\ (38.75)}$$

$$= .99948$$

$$= 1.8478°$$

   c. Torque Arm = y = (c) (tan α)
   = (38.75) (tan 1.8478)
   = (38.75) (.03226)
   = 1.25 in.

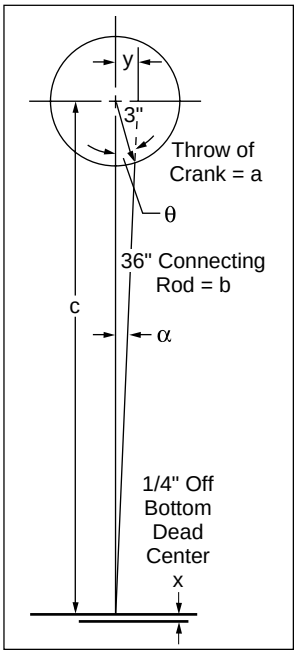
Torque @ Crank
= (Rate Tonnage) (2000 lb./ton)(Torque Arm)
= (200) (2000) (1.25)
= 500,000 lb.in.

Required Torque @ Clutch

$$= \frac{\text{(Torque @ Crank) x (Crankshaft rpm)}}{\text{Clutch Shaft RPM}} \text{ lb.in.}$$

$$= \frac{(500{,}000)\ (30)}{204} \text{ lb.in.}$$

= 73,529 lb.in.



Application selection torque = the required torque of 73,529 lb.in. x 1.3 (application factor used for CCB units.) or 95,587 lb.in.

Preliminary selection of CCB based on clutch torque is the CCB 600 with 75% spring compliment. The clutch torque for this model is 106,425 lb.in. @ 80 psi.

d. Maximum bore for CCB 600 is 4.92 in. bore acceptable.

2. To determine application brake torque necessary to stop the equipment the following information is needed:

a. The inertia of rotating parts referred to the backshaft. It is given in the application data that the inertia (WR^2) of parts on the crankshaft is 39,091 $lb.ft.^2$ at 30 rpm. To calculate WR^2 referred to the backshaft:

$$\left(\frac{\text{30 rpm of Crankshaft}}{\text{204 rpm of Backshaft}}\right)^2 \times 39{,}091\ lb.ft.^2$$

= 845 $lb.ft.^2$ @ 204 rpm

Total WR^2 referred to backshaft is:

845 $lb.ft.^2$ + 78 $lb.ft.^2$ = 923 $lb.ft.^2$
(WR^2 of parts on backshaft from application data)

Total WR^2 to start and stop is:

923 $lb.ft.^2$ + 118 $lb.ft.^2$ = 1041 $lb.ft.^2$
(WR^2 of CCB-600 from page 14)

b. The brake stop time required in 120. (Based on rotation at 30 rpm).

$$\text{Stop Time} = \frac{\text{Angle to Stop}}{360} \frac{60}{\text{crankshaft rpm}}$$

$$= \frac{120}{360} \frac{60}{30} = .5 \text{ sec}$$

c. Required deceleration torque =

$$\frac{(WR^2)\ (\text{CCB rpm})}{(25.6)\ (\text{Stop Time Sec.})} \text{ or } \frac{(1041)\ (204)}{(25.6)(.5)}$$

= 16,590 lb.in.

d. Application brake torque = (16,590) (1.3) or 21,567 lb.in.

The CCB 600 has a rated brake torque capacity of 53,755 lb.in. with 75% spring compliment.

3. To determine the Heat Horsepower Capacity of the CCB at backshaft speed you need the following information:

a. Heat hp capacity of CCB 600 @ 100 rpm and 300 rpm. (See pg.13 bottom).

Heat hp = 3 @ 100 rpm and 4.3 @ 300 rpm.

b. Heat hp capacity of CCB 600 @ 204 rpm =

$$\frac{(\text{CCB rpm} - 100)}{(300 \text{ rpm} - 100)} (\text{hp @ 300 rpm} - \text{hp @ 100 rpm}) + \text{hp @ 100 rpm}$$

$$= \frac{(204-100)}{(300-100)} (4.3 - 3) + 3$$

= 3.6 Heat hp @ 204 rpm

c. To determine the Cycles Per Minute Capacity you need the following information:

$$\frac{(\text{Heat hp @ CCB speed})\ (2 \times 10^8)}{(WR^2)\ (\text{rpm})^2}$$

or

$$\frac{3.6\ (2 \times 10^8)}{(1041)\ (204)^2}$$

= 16 cpm

Final Selection:

CCB 600 with 3/4 spring compliment. Also available with shrink disc shaft mounting. (See pages 16 or 17 for various mounting arrangments).

Note:
This application example is for preliminary sizing only. Contact a Wichita Sales Engineer or the factory for final selection.

Heat Horsepower Capacity

Model No.	RPM				
	100	300	500	700	900
170	.12	.20	.25	.28	.31
190	.16	.25	.30	.34	.36
230	.28	.42	.48	.54	.61
310	.51	.74	.93	1.02	1.12
380	1	1.6	1.9	2	2.7
470	1.7	2.4	3.1	3.6	4.2
550	2.5	3.5	4.3	5.1	6
600	3	4.3	5.5	6.2	7
675	3.7	5	6.5	7.6	
760	5	7.1	8.3	9.5	
830	6.5	9.3	11.1	12.7	
910	8	11.5	14		

Combination Clutch/Brake

Specifications

Size 380 thru 910

CCB Model	Spring Compliment %	Clutch Dynamic Slip Torque Capacity @ 80 PSI** lb.in.	(Nm)	Brake Dynamic Slip Torque Capacity** lb.in.	(Nm)	Maximum Speed* (RPM)	Internal Parts Inertia lb-ft²	(kgm²)	'R' External Parts Inertia lb-ft²	(kgm²)	Total Weight (RR Style) lb	(kg)
380	100%	23,000	(2,596)	18,000	(2,030)	1550	12.4	(.52)	4	(0.17)	99	(45)
	75%	27,500	(3,100)	13,500	(1,525)							
	50%	32,000	(3,600)	9,000	(1,015)							
	25%	36,500	(4,120)	4,500	(505)							
470	100%	43,400	(4,900)	34,500	(3,890)	1250	33.3	(1.4)	16	(0.67)	190	(86)
	75%	52,000	(5,870)	25,900	(2,920)							
	50%	60,650	(6,845)	17,250	(1,945)							
	25%	69,275	(7,800)	8,625	(975)							
550	100%	68,100	(7,685)	54,000	(6,095)	1060	70.2	(3.0)	23	(0.97)	290	(132)
	75%	81,600	(9,210)	40,500	(4,570)							
	50%	95,100	(10,733)	27,000	(3,050)							
	25%	108,600	(12,260)	13,500	(1,525)							
600	100%	88,500	(9,900)	71,700	(8,090)	970	118	(5.0)	72	(3.0)	380	(172)
	75%	106,425	(12,000)	53,775	(6,070)							
	50%	124,350	(14,035)	35,850	(4,045)							
	25%	142,275	(16,060)	17,925	(2,220)							
675	100%	132,000	(14,900)	105,400	(11,910)	860	209	(8.8)	80	(3.4)	530	(240)
	75%	158,350	(17,875)	79,050	(8,930)							
	50%	184,700	(20,845)	52,700	(5,955)							
	25%	211,050	(23,820)	26,350	(2,975)							
760	100%	190,300	(21,480)	154,000	(17,380)	765	370	(15.6)	154	(6.5)	760	(345)
	75%	228,800	(25,825)	115,500	(13,035)							
	50%	267,350	(30,170)	77,000	(8,690)							
	25%	305,800	(34,500)	38,500	(4,345)							
830	100%	254,500	(28,750)	199,000	(22,480)	700	455	(19.2)	226	(9.5)	635	(288)
	75%	309,700	(34,990)	149,300	(16,870)							
	50%	337,300	(38,110)	124,400	(14,055)							
	25%	392,500	(44,345)	74,600	(8,430)							
910	100%	346,800	(39,150)	258,400	(29,160)	640	820	(34.5)	280	(11.8)	1190	(540)
	75%	411,400	(46,430)	193,800	(21,870)							
	50%	476,000	(52,725)	129,200	(14,580)							
	25%	540,600	(66,000)	64,600	(7,290)							

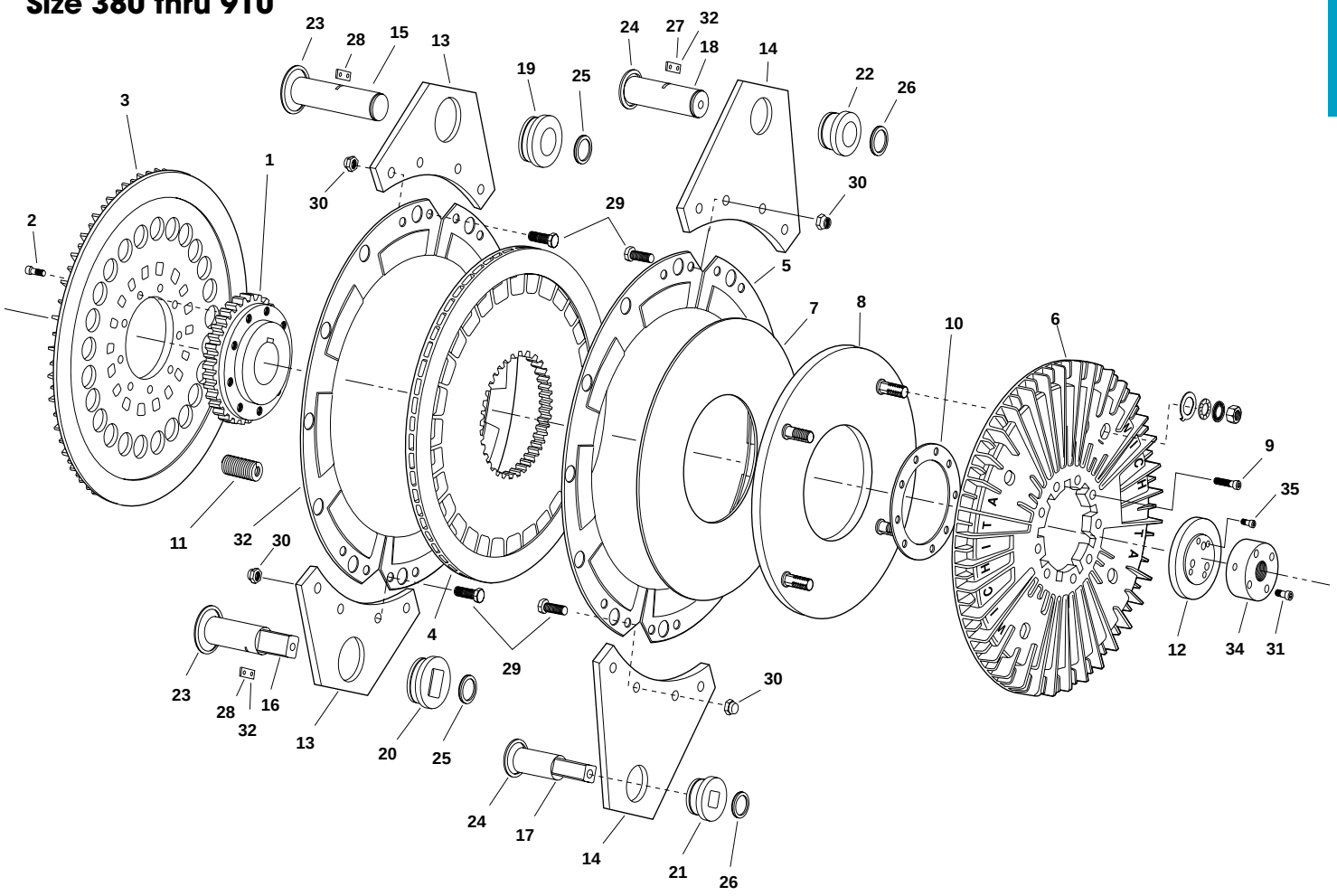
Max. operating pressure Pmax=7 bar. 1 bar=14.5 psig.

* For continuous running only. In the case of high speeds, it is necessary to balance the unit.

** For dry running only, it is essential to keep the friction surfaces free of lubricants.

Component Parts

Size 380 thru 910



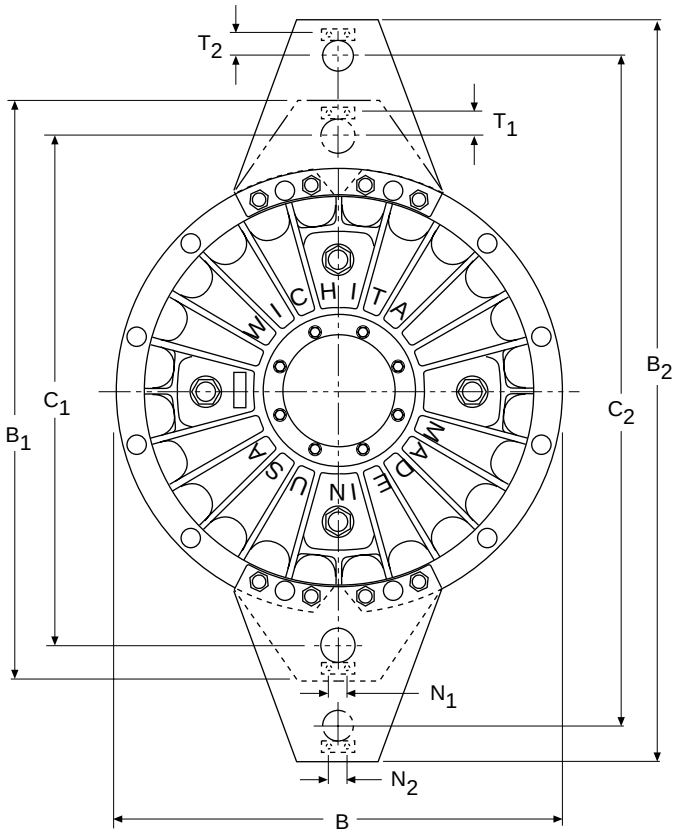
1. Hub
2. Bolt
3. Back Plate
4. Center Plate
5. Drive Plate
6. Air-Tube Holding Plate
7. Pressure Plate
8. Air-Tube
9. Air-Tube Holding Plate Bolts
10. Shim
11. Brake Springs
12. End Cap
13. Short Mounting Bracket
14. Long Mounting Bracket
15. Drive Pin (Round Clutch)
16. Drive Pin (Square Clutch)
17. Drive Pin (Square Brake)
18. Drive Pin (Round Brake)
19. Drive Bushing (Round Clutch)
20. Drive Bushing (Square Clutch)
21. Drive Bushing (Square Brake)
22. Drive Bushing (Round Brake)
23. Snap Ring
24. Snap Ring
25. Snap Ring
26. Snap Ring
27. Retainer Plate (Brake Drive Pin)
28. Retainer Plate (Clutch Drive Pin)
29. Hex Head Cap Screw (HHCS)
30. Flex Lock Nuts
31. Socket Head Cap Screw (SHCS)
32. Hex Head Cap Screw
33. Air Spud
34. Air Manifold
35. Socket Head Cap Screw (SHCS)

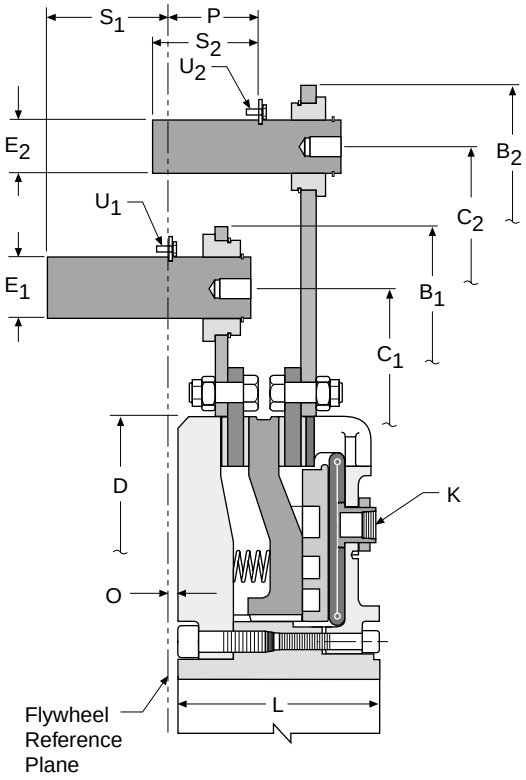
Not Shown:

- Bolt & Nut between Pressure Plate and Center Plate
- Clip, Bolt & Nut on Ring Mount

Combination Clutch/Brake

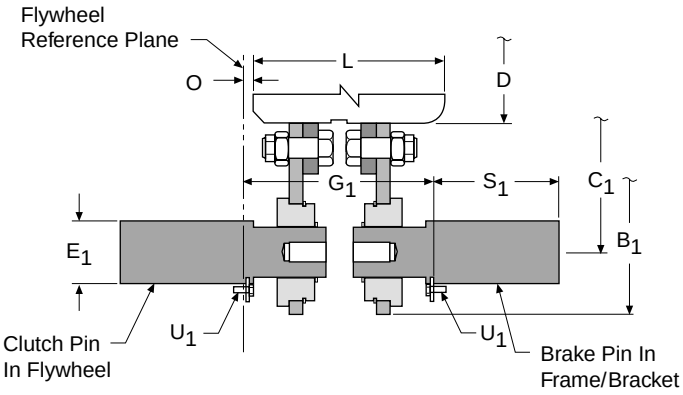
Size 380 thru 910





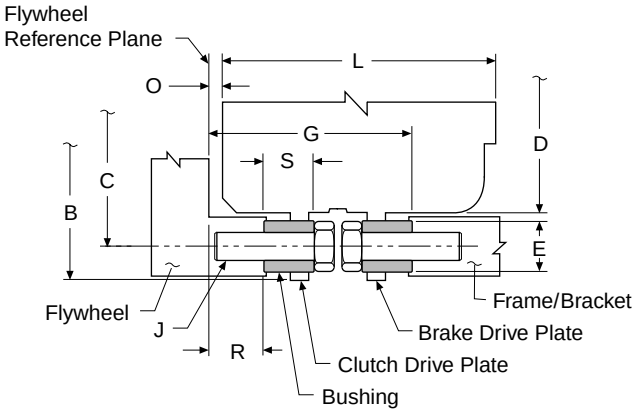
PEP

(Pin to Extended Pin)



PP

(Pin to Pin)



RR

(Ring to Ring)

RP (Ring to Pin)

RR (Ring to Ring)*

PP (Pin to Pin)*

* Dimensions same as RP design
All ring drives to have pins located
in pin size counterbores 0.13" deep.

Dimensions (mm)

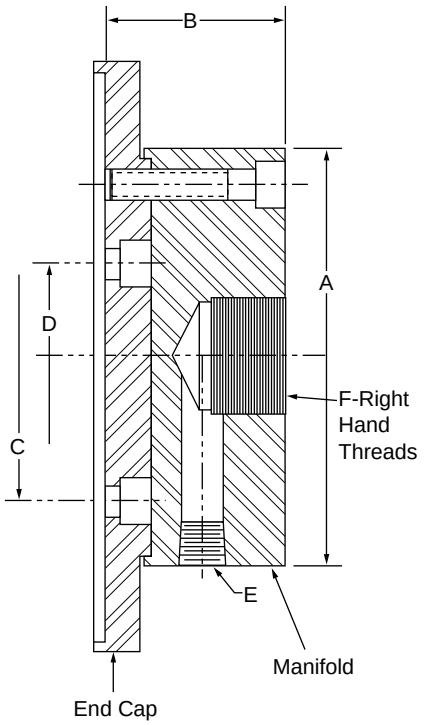
Model No.	A Max Bore*	C, C1, C2 dimensions are ± .007 (.18)											
		B	B_1	B_2	C	C_1	C_2	D	E +.000/ -.002	E_1 +.001/ -.000	E_2 +.001/ -.000	G RR	G_1 PP
380	3.543 (90)	17.13 (435)	22.05 (560)	26.77 (680)	16.063 (408)	19.488 (495)	25.000 (635)	14.94 (380)	0.709 (18)	1.181 (30)	0.866 (22)	3.24 (82.2)	4.32 (109.7)
470	3.740 (95)	21.06 (535)	27.36 (695)	33.66 (855)	19.685 (500)	24.016 (610)	31.102 (790)	18.50 (470)	0.984 (25)	1.575 (40)	1.181 (30)	4.02 (102.1)	4.88 (124.0)
550	4.331 (110)	24.41 (620)	30.71 (780)	37.40 (950)	22.992 (584)	27.362 (695)	34.843 (885)	21.65 (550)	0.984 (25)	1.575 (40)	1.181 (30)	5.06 (128.4)	6.42 (163.1)
600	4.921 (125)	26.77 (680)	34.25 (870)	42.32 (1075)	25.197 (640)	30.315 (770)	38.976 (990)	23.62 (600)	1.181 (30)	1.772 (45)	1.575 (40)	4.83 (122.6)	6.22 (158.0)
675	5.519 (140)	30.51 (775)	39.37 (1000)	48.56 (1235)	28.543 (725)	34.646 (880)	44.685 (1135)	26.57 (675)	1.378 (35)	2.165 (55)	1.772 (45)	5.39 (136.9)	6.98 (177.3)
760	6.299 (160)	34.06 (865)	42.91 (1090)	52.56 (1335)	31.890 (810)	38.189 (970)	48.622 (1235)	29.92 (760)	1.575 (40)	2.165 (55)	1.772 (45)	5.96 (151.4)	7.50 (190.5)
830	7.087 (180)	37.50 (953)	49.31 (1252)	63.09 (1602)	35.039 (890)	43.307 (1100)	57.087 (1450)	32.68 (830)	1.772 (45)	2.954 (75)	2.560 (65)	7.19 (182.6)	8.75 (222.3)
910	7.087 (180)	40.35 (1025)	52.76 (1340)	65.75 (1670)	37.992 (965)	46.457 (1180)	60.039 (1525)	35.82 (910)	1.772 (45)	2.953 (75)	2.559 (65)	7.43 (188.7)	9.61 (244.1)

Model No.	K Qty.	K Size	Lengths (mm) L	N_1	N_2	O	P	R	S	S_1	S_2	T_1	T_2	Thread J	U_1	U_2
380	4	1/2" NPT	4.41 (112)	1.00 (25)	1.00 (25)	0.47 (12)	2.05 (52.0)	0.96 (45.5)	0.75 (19)	2.36 (60)	1.77 (45)	0.79 (20)	0.63 (16)	3/8–16 NC	#10–24 NC	#10–24 NC
470	4	1/2" NPT	5.50 (140)	1.378 (35)	1.00 (25)	0.41 (10.5)	2.60 (66.5)	1.12 (28.5)	0.87 (22)	3.15 (80)	2.36 (60)	1.06 (27)	0.79 (20)	1/2–13 NC	1/4–20 NC	#10–24 NC
550	4	1/2" NPT	6.30 (160)	1.378 (35)	0.984 (25)	0.51 (13.0)	3.17 (80.5)	1.34 (34)	1.18 (30)	3.15 (80)	2.36 (60)	1.06 (27)	0.79 (20)	1/2–13 NC	1/4–20 NC	#10–24 NC
600	4	1/2" NPT	7.28 (185)	1.378 (35)	1.378 (35)	0.49 (12.5)	3.19 (81.0)	1.32 (33.5)	1.06 (27)	3.54 (90)	3.15 (80)	1.16 (29.5)	1.06 (27)	5/8–11 NC	5/16–18 NC	1/4–20 NC
675	4	1" NPT	8.00 (203)	1.772 (45)	1.378 (35)	0.49 (12.5)	3.88 (98.5)	1.42 (36)	1.25 (32)	4.33 (110)	3.54 (90)	1.52 (38.5)	1.16 (29.5)	3/4–10 NC	5/16–18 NC	1/4–20 NC
760	4	1" NPT	9.06 (230)	1.772 (45)	1.378 (35)	0.49 (12.5)	4.23 (107.5)	1.59 (40.5)	1.50 (38)	4.33 (110)	3.54 (90)	1.52 (38.5)	1.16 (29.5)	7/8–9 NC	5/16–18 NC	1/4–20 NC
830	4	1" NPT	8.00 (203)	1.75 (45)	1.75 (45)	0.50 (12.7)	4.32 (109.7)	1.94 (49.3)	1.75 (44.5)	5.91 (150.1)	5.12 (130)	1.71 (43.5)	1.71 (43.5)	1–8 NC	5/16–18 NC	5/16–18 NC
910	3	1" NPT	10.24 (260)	2.362 (60)	1.772 (45)	0.89 (22.5)	4.90 (124.5)	2.10 (53.5)	1.75 (44.5)	5.91 (150)	5.12 (130)	2.07 (52.5)	1.71 (43.5)	1–8 NC	3/8–16 NC	5/16–18 NC

* Maximum bores with square key. Larger bores available with shallow keys.
Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

End Cap Air Manifold

Model	Kit No.	A	B	C	D	E	F
380	8-546-021-000-1	4.188	3.12	N/A	.875 H.C. 13/32 Drill 3 at 120°	1/2 NPT 4 at 90°	1" - 14 NF
470	8-547-021-000-1	4.188	3.12	N/A	1.250 H.C. 13/32 Drill 3 at 120°	1/2 NPT 4 at 90°	1"-14 NF
550	8-549-021-000-1	4.937 / 4.935	3.12	3.000 H.C. 13/32 Drill 3 at 120°	2.000 H.C. 13/32 Drill 3 at 120°	1/2 NPT 4 at 90°	1-1/2" - 12 NF
600	8-552-021-000-1	4.938	3.12	2.875 H.C. 13/32 Drill 3 at 120°	N/A	1/2 NPT 4 at 90°	1-1/2"-12 NF
675	8-552-021-000-1	4.938	3.12	2.875 H.C. 13/32 Drill 3 at 120°	N/A	1/2 NPF 4 at 90°	1-1/2"-12 NF
760	8-553-021-000-1	7.000	3.12	N/A	3.500 H.C. 13/32 Drill 3 at 120°	1/2 NPT 4 at 90°	1-1/2"-12 NF
830	4-555-021-000-3	9.50	4.06	N/A	4.000 H.C. 9/16 Drill 4 at 90°	1" NPT 4 at 90°	1-1/2"-12 NF
910	8-554-021-000-1	7.255 / 7.250	3.12	5.000 H.C. 17/32 Drill 3 at 120°	3.250 H.C. 17/32 Drill 3 at 120°	1/2 NPT 6 at 60°	2"-12 NF

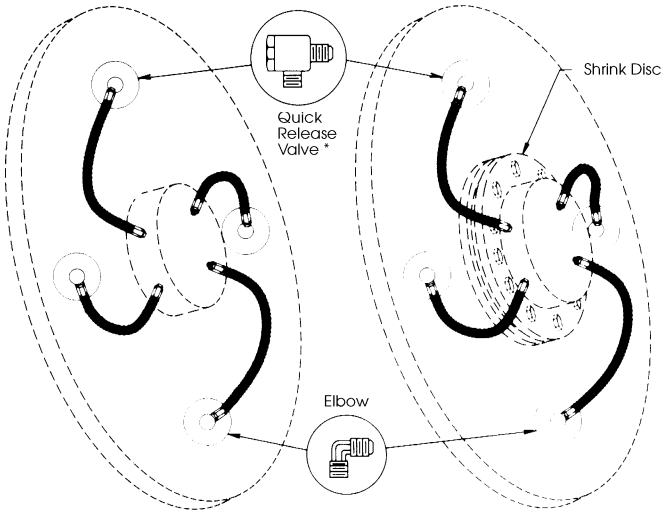


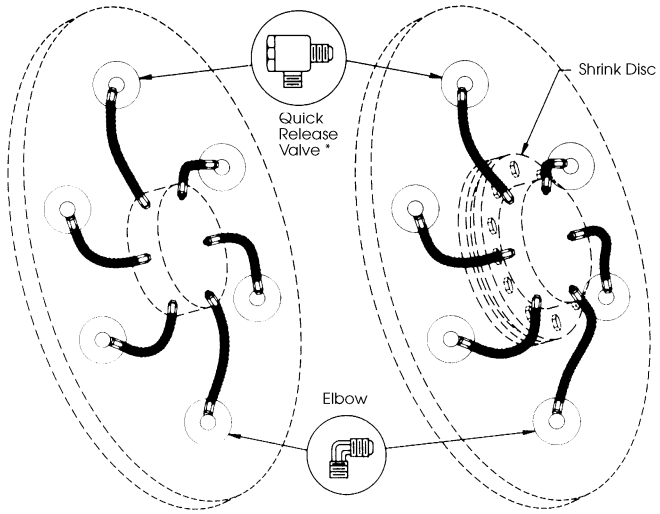
Clearance & Wear Chart

Model	Minimum Clearance in.	Minimum Clearance mm	W+ in.	W+ mm	K+	Maximum Wear in.	Maximum Wear mm	Tank Vol. in.³	Tank Vol. liters	Pipe Size in.	Pipe Size mm	Roto-Coupling* Part No.
380	1/32	0.8	0.1	2.5	86	0.12	3	100	1.6	3/4	19	8-240-708-001-1
470	1/32	0.8	0.1	2.5	134	0.16	4	155	2.5	3/4	19	8-240-708-001-1
550	3/64	1.2	0.11	2.8	196	0.20	5	250	4.1	1	32	8-240-710-002-1
600	3/64	1.2	0.11	2.8	215	0.20	5	275	4.5	1	32	8-240-710-002-1
675	1/16	1.6	0.12	3.2	280	0.25	6	390	6.4	1	32	8-240-710-002-1
760	1/16	1.6	0.12	3.2	360	0.25	6	500	8.2	1	32	8-240-710-002-1
830	3/32	2.4	0.16	4	489	0.25	6	800	13.1	1-1/2	38	8-240-710-002-1
910	3/32	2.4	0.16	4	530	0.28	7	1000	16.4	1-1/2	38	8-240-712-001-1

*See page 25 for dimensions

Air Hose Kits for Sizes 380 thru 910





* Optional Quick Release Valves can replace elbows on most units.

Hose Kit for Air Manifold or Cross Drilled Shaft Mounting

Model	Part Number
380	8-938-812-402-5 ELB 8-938-820-401-5 QRV
470	8-947-812-402-5 ELB 8-947-820-401-5 QRV
550	8-955-812-402-5 ELB 8-955-820-401-5 QRV
600	8-960-812-402-5 ELB 8-960-820-401-5 QRV
675	8-967-812-402-5 ELB 8-967-820-401-5 QRV
760	8-976-812-402-5 ELB 8-976-820-401-5 QRV
830	8-983-813-401-5 ELB 8-983-831-401-5 QRV

Hose Kit for Shrink Disc Mid-Shaft Mounting

Model	Part Number
380	8-938-812-401-5 ELB 8-938-822-401-5 QRV
470	8-947-812-401-5 ELB 8-947-822-401-5 QRV
550	8-955-812-401-5 ELB 8-955-822-401-5 QRV
600	8-960-812-401-5 ELB 8-960-822-401-5 QRV
675	8-967-812-401-5 ELB 8-967-822-401-5 QRV
760	8-976-812-401-5 ELB 8-976-822-401-5 QRV
830	8-983-813-402-5 ELB 8-983-831-402-5 QRV

Hose Kit for Air Manifold or Cross Drilled Shaft Mounting

Model	Part Number
910	8-991-812-502-5 ELB 8-991-820-501-5 QRV

Hose Kit for Shrink Disc Mid-Shaft Mounting

Model	Part Number
910	8-991-812-503-5 ELB 8-991-822-503-5 QRV

Wichita Air Hose Kits contain all the necessary parts (fittings, hoses and extensions) to completely plumb the brake air system. The Hose Kit part number is determined by model number, type of shaft mounting and whether or not a quick release valve is needed.

Specifications

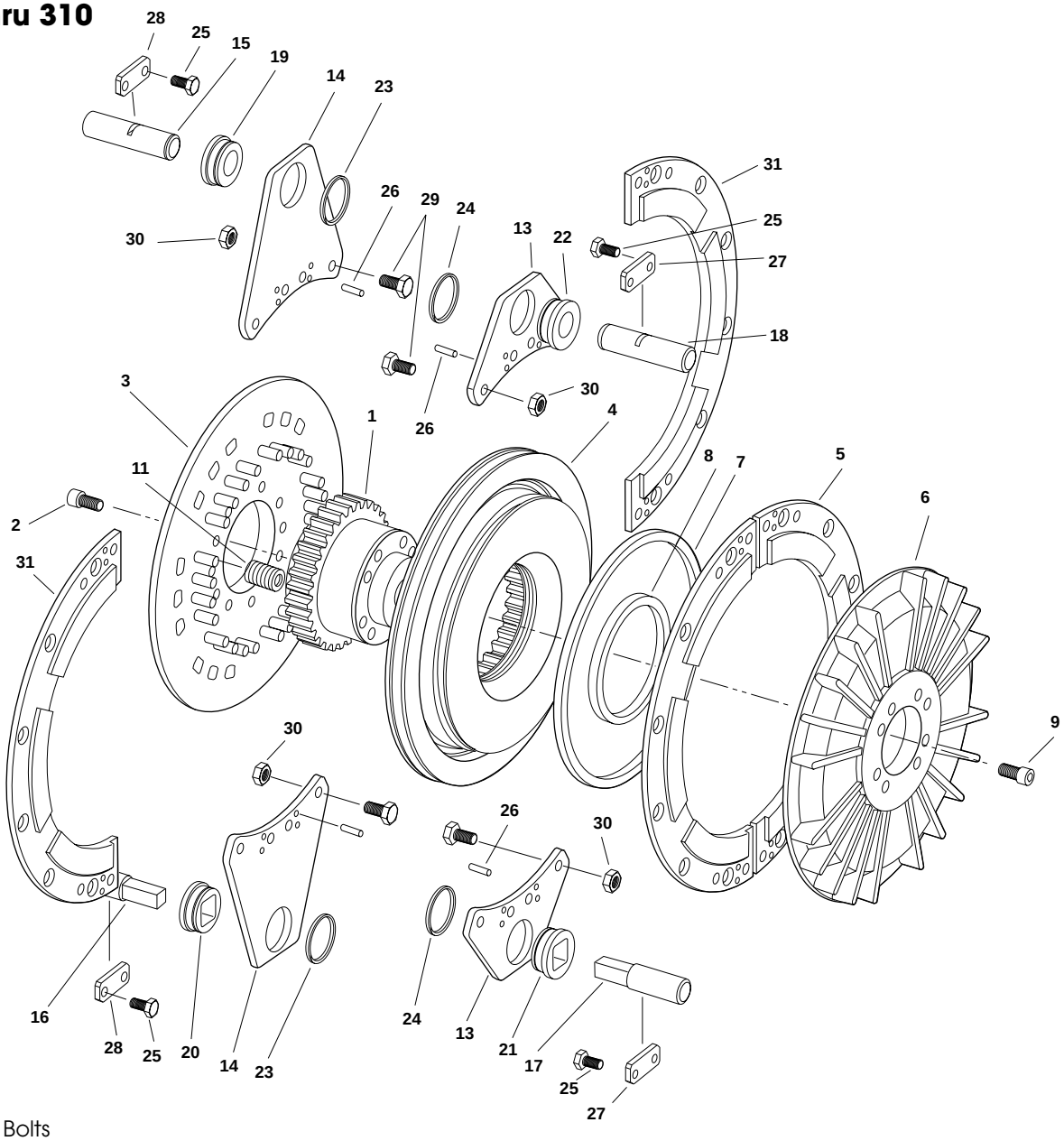
Size 170 thru 310

CCB Model	Clutch Dynamic Slip Torque Capacity @ 80 PSI lb.in.	(Nm)	Brake Dynamic Slip Torque Capacity lb.in.	(Nm)	Maximum Speed (RPM)	Internal Parts Inertia lb-ft²	(kgm²)	'R' External Parts Inertia lb-ft²	(kgm²)	Total Weight (RR Style) lb	(kg)	Cylinder Volume New / Worn in³	(cm³)
170/13	1150	(130)	1330	(150)	3450	0.31	(0.013)	0.095	(0.004)	11.9	(5.4)	2.45 / 3.65	(40) / (60)
170/17	1505	(170)	975	(110)									
170/21	1815	(205)	665	(75)									
170/25	2170	(245)	310	(35)									
190/21	1815	(205)	2125	(240)	3050	0.57	(0.024)	0.14	(0.006)	17.0	(7.7)	3.35 / 5.20	(55) / (85)
190/27	2345	(265)	1595	(180)									
190/33	2880	(325)	1060	(120)									
190/39	3410	(385)	530	(60)									
230/41	3630	(410)	4120	(465)	2425	1.78	(0.075)	0.47	(0.020)	31.1	(14.1)	5.50 / 8.85	(90) / (145)
230/53	4650	(525)	3100	(350)									
230/64	5670	(640)	2080	(235)									
230/76	6690	(755)	1060	(120)									
310/92	8100	(915)	9300	(1050)	1875	5.24	(0.221)	1.42	(0.060)	61.1	(27.7)	10.10 / 16.80	(165) / (275)
310/118	10,450	(1180)	6950	(785)									
310/144	12,750	(1440)	4650	(525)									
310/171	15,100	(1705)	2300	(260)									

For cyclic applications use 60% of torque rating.

Component Parts

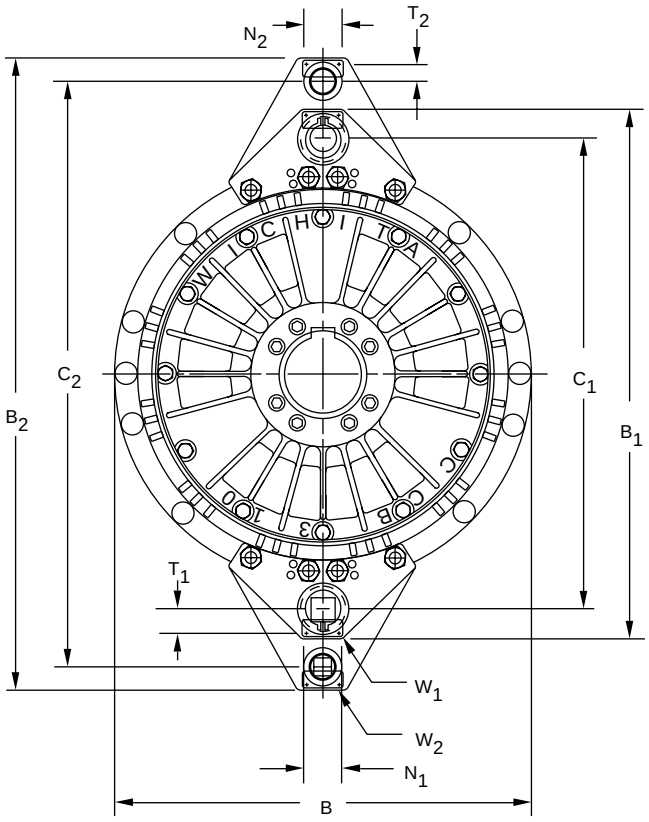
Size 170 thru 310



1. Hub
2. Back Plate Bolts
3. Back Plate
4. Center Plate
5. Brake Friction Plate
6. Air-Tube Holding Plate
7. Piston Seal O.D.
8. Piston Seal I.D.
9. Air-Tube Holding Plate Bolts
10. Seal (see page 24)
11. Brake Springs
12. Seal Plate (see page 24)
13. Short Mounting Ears
14. Long Mounting Ears
15. Drive Pin (Round Clutch)
16. Drive Pin (Square Clutch)
17. Drive Pin (Square Brake)
18. Drive Pin (Round Brake)
19. Drive Bushing (Round Clutch)
20. Drive Bushing (Square Clutch)
21. Drive Bushing (Square Brake)
22. Drive Bushing (Round Brake)
23. Snap Ring
24. Snap Ring
25. Bolt
26. Roll Pin
27. Retainer Plate (Brake Drive Pin)
28. Retainer Plate (Clutch Drive Pin)
29. Hex Head Cap Screw (HHCS)
30. Flex Lock Nuts
31. Clutch Friction Plate

Combination Clutch/Brake

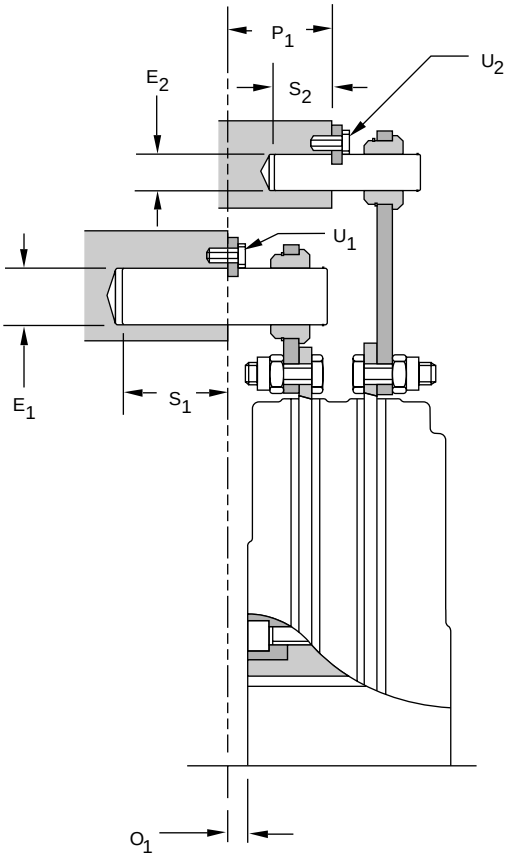
Size 170 thru 310



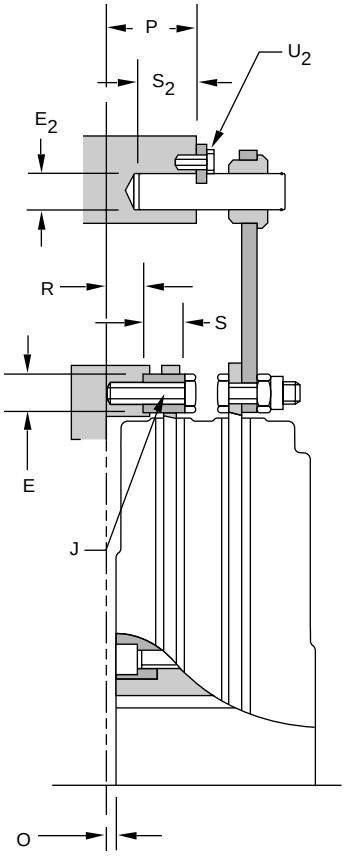
Dimensions (mm)

Model No.	A Max Bore	C, C_1, C_2 dimensions are ± .007 (.18)												Lengths (mm)		
		B	B_1	B_2	C	C_1	C_2	D	E	E_1	E_2	W_1	W_2	L	N_1	N_2
170	1.38 (35)	7.80 (198)	10.32 (262)	13.27 (337)	7.165 (182)	9.055 (230)	12.008 (305)	6.54 (166)	0.394 (10)	0.551 (14)	0.551 (14)	0.18 (4.5)	0.18 (4.5)	1.811 (46)	0.787 (20)	0.787 (20)
190	1.38 (35)	8.66 (220)	11.10 (282)	14.06 (357)	8.071 (205)	9.843 (250)	12.795 (325)	7.40 (188)	0.394 (10)	0.551 (14)	0.551 (14)	0.18 (4.5)	0.18 (4.5)	2.283 (58)	0.787 (20)	0.787 (20)
230	1.77 (45)	10.83 (275)	14.17 (360)	17.40 (442)	10.039 (255)	12.402 (315)	16.142 (410)	9.29 (236)	0.472 (12)	0.866 (22)	0.551 (14)	0.22 (5.5)	0.18 (4.5)	2.598 (66)	0.984 (25)	0.787 (20)
310	2.56 (65)	13.66 (347)	17.13 (435)	21.73 (522)	12.795 (325)	15.354 (390)	19.291 (490)	11.97 (304)	0.591 (15)	0.866 (22)	0.551 (14)	0.22 (5.5)	0.88 (4.5)	3.228 (82)	0.984 (25)	0.787 (20)

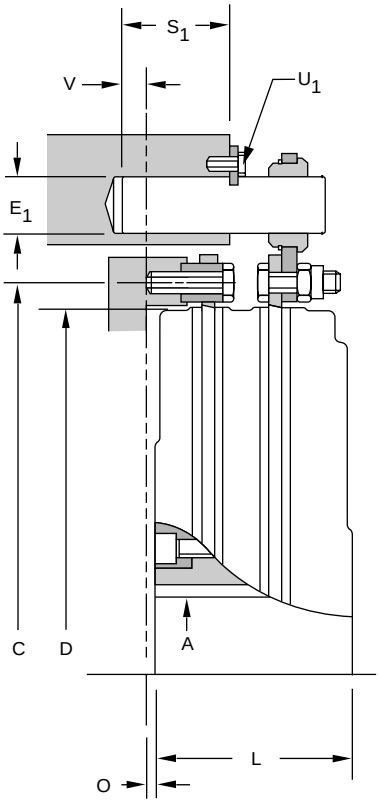
Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.



PEP Design
Pin to
Extended Pin



RP Design
Ring to
Extended Pin



RP Design
Ring to Pin

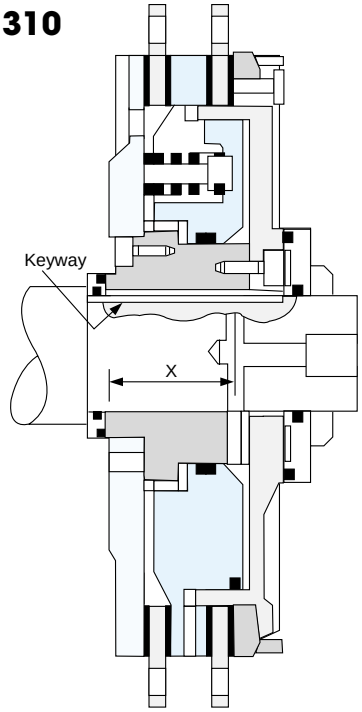
Model No.	Lengths (mm)										Thread			
	O	O_1	P	P_1	R	S	S_1	S_2	T_1	T_2	V	J	U_1	U_2
170	0.079 (2)	0.217 (5.5)	0.866 (22)	1.004 (25.5)	0.236 (6)	0.433 (11)	0.984 (25)	0.984 (25)	0.433 (11)	0.433 (11)	0.118 (3)	M5 (M5)	M4 (M4)	M4 (M4)
190	0.118 (3)	0.217 (5.5)	1.063 (27)	1.161 (29.5)	0.394 (10)	0.433 (11)	1.103 (28)	1.103 (28)	0.433 (11)	0.433 (11)	0 (0)	M5 (M5)	M4 (M4)	M4 (M4)
230	0.158 (4)	0.335 (8.5)	1.260 (32)	1.437 (36.5)	0.512 (13)	0.512 (13)	1.772 (45)	1.103 (28)	0.630 (16)	0.433 (11)	0.512 (13)	M6 (M6)	M5 (M5)	M4 (M4)
310	0.158 (4)	0.394 (10)	1.535 (39)	1.772 (45)	0.591 (15)	0.630 (16)	1.772 (45)	1.103 (28)	0.630 (16)	0.433 (11)	0.394 (10)	M8 (M8)	M5 (M5)	M4 (M4)

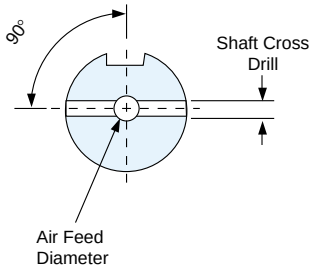
All ring mountings use 12 bushings 'E' diameter, equally spaced on 'C' pitch circle diameter.
Non standard suspension plates may be available on request.

Combination Clutch/Brake

Size 170 thru 310

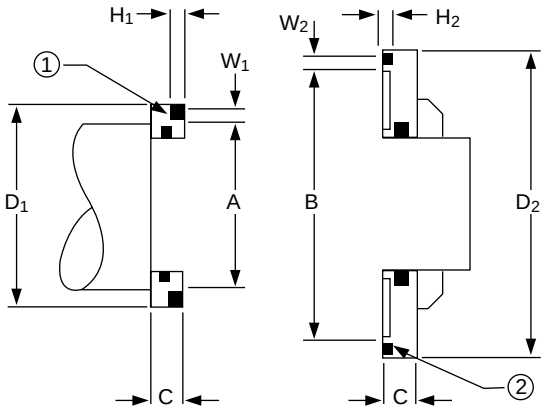
Air Supply Dimensions





	Dimension X (mm)	Shaft Cross Drill (mm)	Air Feed Dia (mm)	Shaft End Tapping
CCB 170	31	4	7	5/8"-18NF
CCB 190	41	5	9	5/8"-18NF
CCB 230	47.5	6	9	5/8"-18NF
CCB 310	50	6	13	1"-14NF

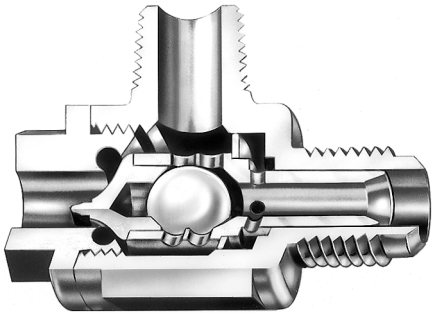
Seal Plate Dimensions (mm)



Seals and seal plates supplied by customer

	A	B	C	D_1	D_2	H_1	H_2	W_1	W_2	"O" Ring to BS 4518
CCB 170	44.5	69.4	10	52	80	1.8	2.3	2.4	3	0446-24 0695-30
CCB 190	44.5	69.4	10	52	80	1.8	2.3	2.4	3	0446-24 0695-30
CCB 230	57.5	89.4	10	65	100	1.8	2.3	2.4	3	0576-24 0695-30
CCB 310	79.4	109.4	10	88	120	2.3	2.3	3	3	0795-30 1095-30

Quick Release Valve



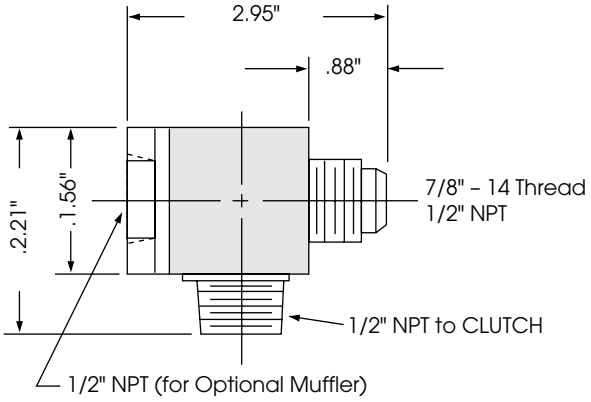
8-263-610-011-1 7/8" – 14 Thread
8-263-610-021-1 1/2" NPT

The Wichita Springless Quick Release Valve discharges twice as fast as any other valve tested in our laboratory and is four to five times faster than some common makes of valves.

This valve will close and seal with less than 20 lbs. pressure. Most others require 25 to 30 lbs. to definitely seal. In actual tests, the Wichita Valve made many hundreds of thousands of engagements and disengagements before the slightest leak occurred, or any parts needed replacement. Other valves which were tested required major replacement in fewer than 20,000 cycles.

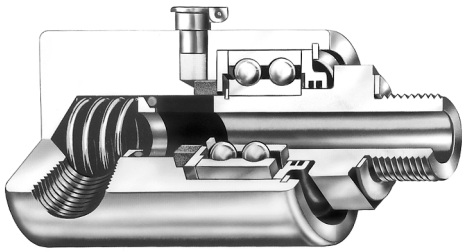
Quality Material

Body and Cap: High strength aluminum alloy
Stem: Moulded nylon
Check Valve: Nylon ball
"O" Ring: Neoprene



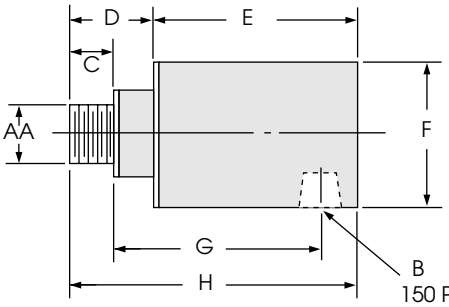
Standard thread arrangement of 1/2" size. 1/2" pipe thread on the tube connection and choice of 1/2" pipe thread, or standard 7/8-14NF thread for flared fitting thread on inlet connection. (Fits standard No. 10 high-pressure hose fitting.)

Roto-couplings



The Wichita Roto-coupling is a device to connect, or couple, a non-rotating air, gas, or fluid line to a rotating shaft.

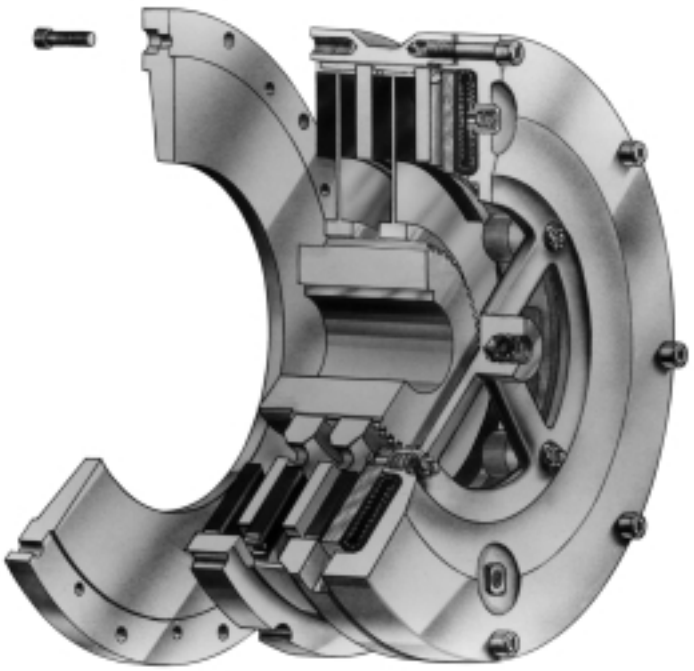
- Long life, no maintenance.
- Felt seal eliminates bearing contamination.
- Fast, easy installation.



Wichita Part No.	AA	B	C	D	E	F	G	H	Max. R.P.M.
8-240-701-003-1	5/8-18NF	1/4" NPT	.40	1.046	2.250	1.500	2.13	3.297	3500
8-240-705-001-1	1"-14 NF	1/2" NPT	.75	1.250	3.188	2.500	3.00	4.438	3500
8-240-708-001-1	1"-14 NF	3/4" NPT	.75	1.313	4.688	2.875	3.69	5.440	3500
8-240-710-002-1	1-1/2"-12 NF	1" NPT	1.13	1.937	4.875	3.250	3.44	6.812	2500
8-240-712-001-1	2"-12 NF	1-1/2" NPT	1.13	2.813	5.250	4.250	5.38	8.062	2500
8-240-714-001-3	2" NPT	2" NPT	1.50	3.000	7.062	4.625	7.00	10.062	1000
8-240-716-000-3	2-1/2" NPT	2-1/2" NPT	1.88	3.250	9.375	7.000	7.75	12.625	750

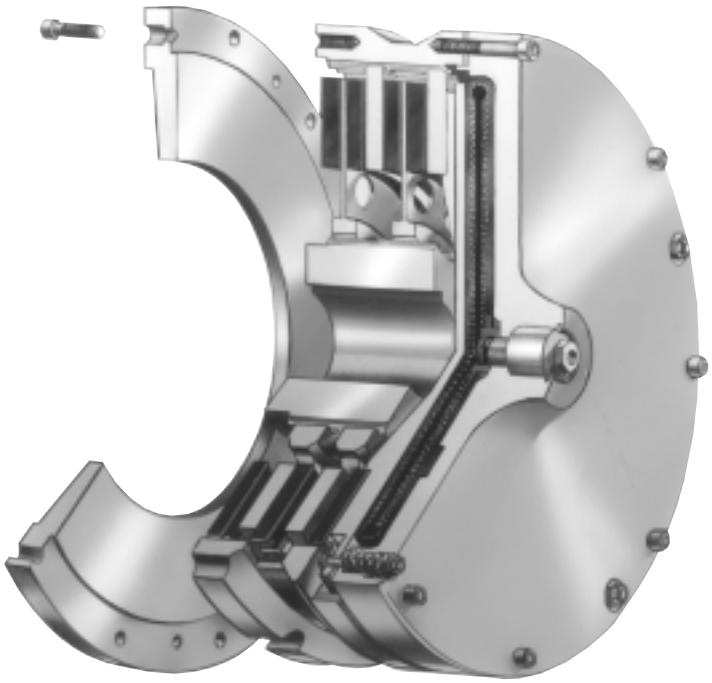
Note: All measurements are in inches.

Air Tube Disc Clutches and Brakes

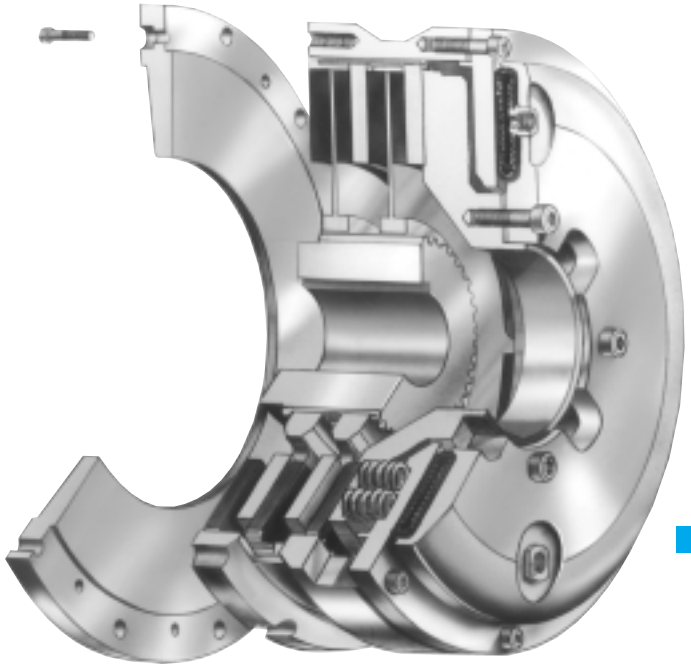


Wichita Air Tube Disc Clutches and Brakes provide the high speed acceleration and deceleration essential for today's process equipment. The low-inertia designs reduce power consumption and heat build-up in cycling applications. A quick energizing air-tube provides fast response with smooth engagement.

Low Inertia and Very Low Inertia clutches and brakes



High-torque clutches



Spring-Set air release brakes

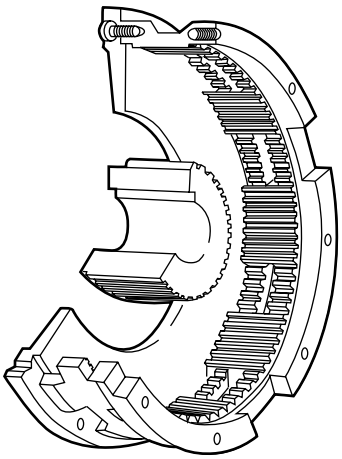
Clutch and brake combinations

4 Clutch combinations

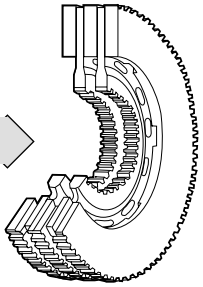
Low inertia
Very low inertia
Low inertia high torque
Very low inertia high torque

4 Brake combinations

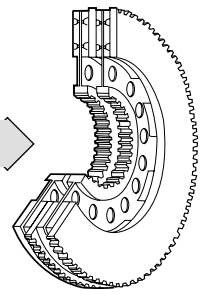
Low inertia
Very low inertia
Low inertia spring-set
Very low inertia spring-set



Ring with demountable backplate and hub



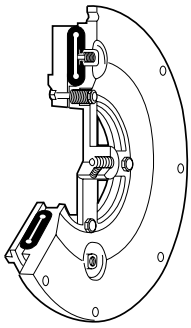
Low inertia



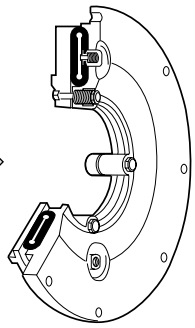
Very low inertia

Drive plate assembly

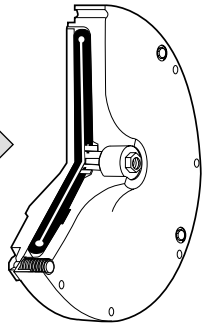
Available with bonded or riveted friction pads



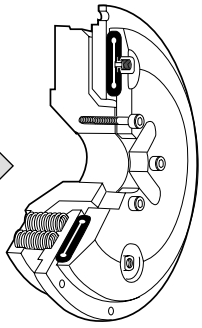
Clutch



Brake



High torque clutch



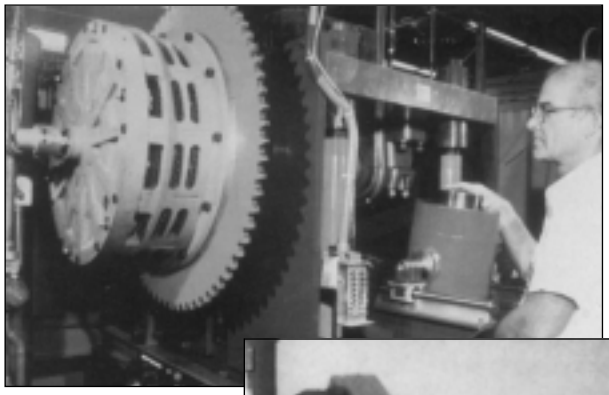
Spring-Set brake

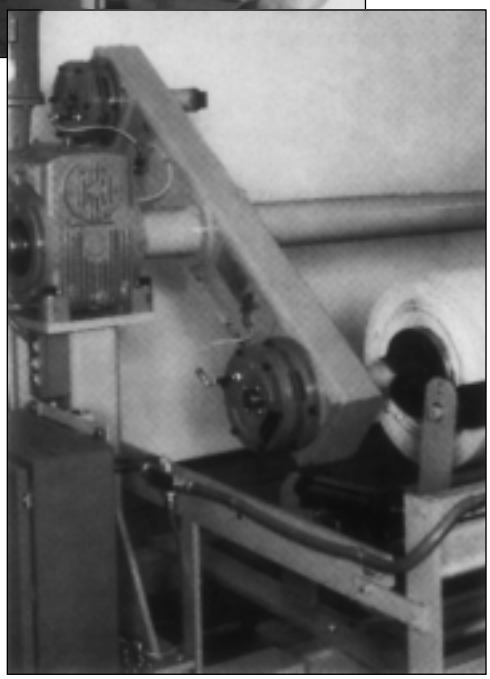
Air Tube Plate (function) Assembly

- Ring with demountable backplate can be used with any of the actuators shown.
- Hub can be used with either the Very Low Inertia or the Low Inertia center plates and friction discs.
- Very Low Inertia design utilizes thick segmented friction discs which increases friction disc life and heat dissipation.

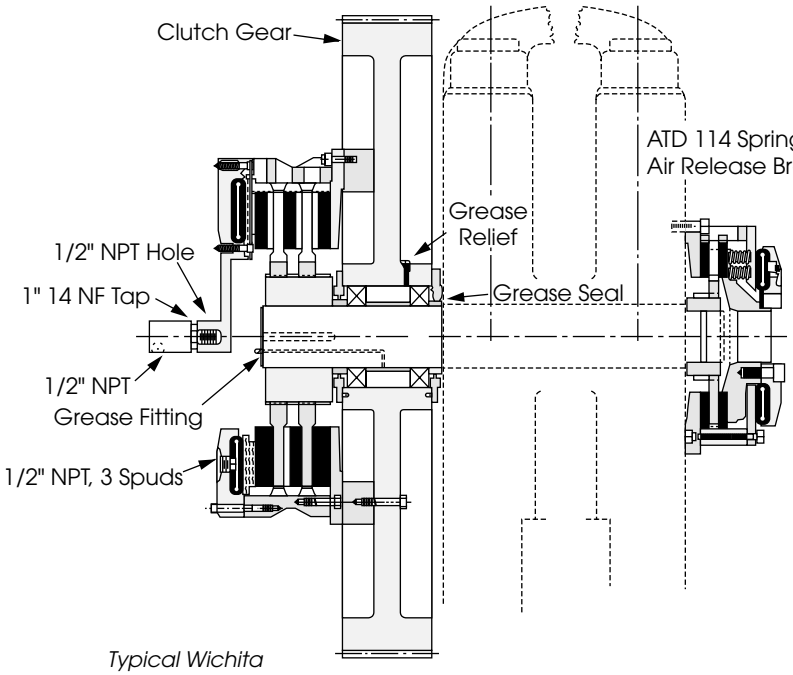
Typical Applications

Wichita High Torque Clutch provides fast acceleration and long life on metal forming punch presses.

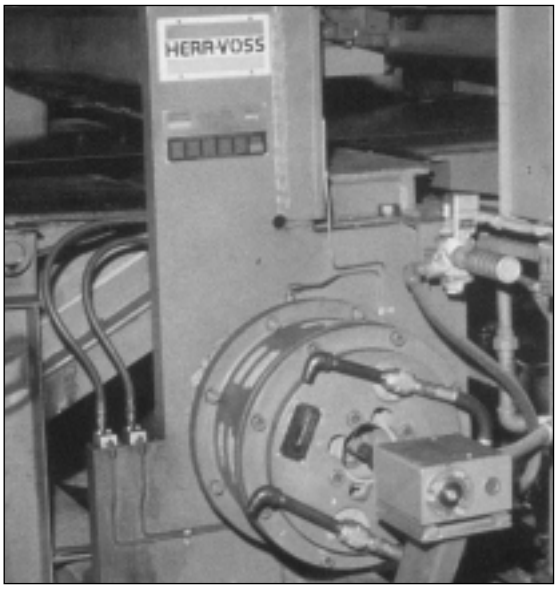




Wichita Low Inertia Brakes increase tension control for paper unwind stands.



Typical Wichita clutch and brake mounting on a press.



Wichita Spring-Set Air Release Brakes insure accuracy and high performance for a metal shear.

Application Factors

Clutch sizes are affected by the following variables:

1. Machines that operate under smooth loads require smaller clutches. These machines are driven by either multi-cylinder high speed engines or electric motors with reduced starting current.
2. Drives that require high starting current motors will require clutches with sufficient torque to prevent excessive slipping while starting.
3. Starting torque may be high, which requires a fast clutch response time to transmit the required torque or extended clutch slip time is required to protect the prime mover.
4. Starting torques may be very low compared to the normal torque, which may result in the clutch not being fully pressurized prior to the time of full torque requirement. This will cause the clutch to overheat from slippage. Clutch inflation time in this instance is very important.
5. Clutches on most machines are designed to slip prior to damage from shockloads. As a result, the clutch may require periodic maintenance; therefore, the clutch should be located for easy access in the power train. Clutches should also be located for maximum cooling air. In instances where this is not possible, forced air cooling may be necessary for extended clutch life.
6. Safe clutch operating speeds should be maintained in product design.

Maximum Clutch Contact Velocity

FPM	Material
6,000 (Recommended upper limit for slip)	cast iron
9,000	ductile iron
12,000	steel

Dynamic balancing recommended when peripheral speeds exceed 3500 fpm. The maximum speeds shown are safe operating speeds based on years of Wichita testing. Please do not exceed these limits.

Application Guidelines

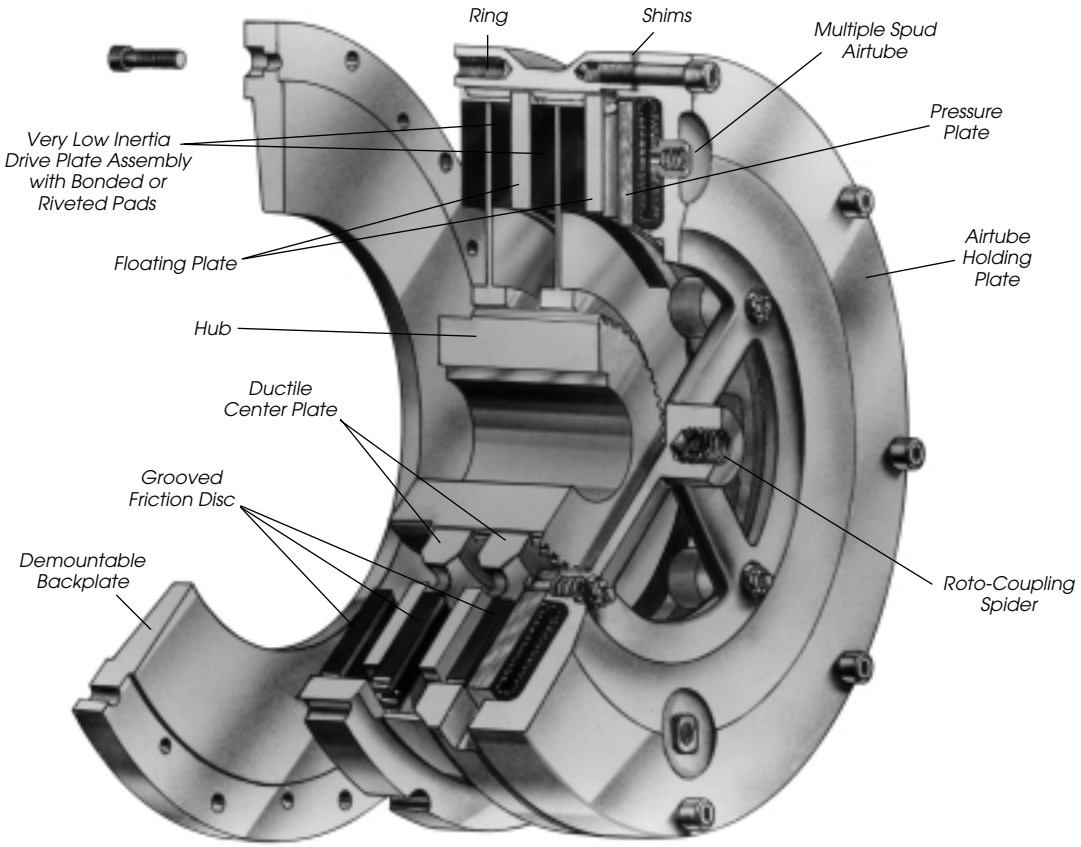
This chart gives application factors ranging from light duty (the A group) to extra heavy duty (the D group).

After initial usage is determined, see "Selection Requirements" to complete the selection process. The inflation and exhaust time should also be checked to insure proper response.

Field of Application	Group A	Group B	Group C	Group D
Air Movement Pumps		Centrifugal compressors	Reciprocating compressors over 2 cylinders, centrifugal fans & blowers	Reciprocating compressors one or two cylinders
Agitators	Liquid	Semi-solid	Solids	
Brick manufacturing			Brick press, extruder, pug mill	
Canning & bottling machine		Bottle-can feeders, filling, mixers		
Engine driven equipment			Crane, hoist, engine	Crowd
Grinding mills			Ball-rod-sag-pebble	Crushers, shakers
Lumber processing		Yarder	Carriages, conveyers	Chipper, logger
Marine		Propulsion clutch CP wheel	Shaft brakes, propulsion reversing type, anchor winch	
Bulk material handling	Conveyors evenly loaded, line shaft evenly loaded	Feeders	Elevators	
Metal production & metalforming		Coilers, slitters, press brake, non-geared press, geared press	Draw bench, rolling mill, shear, back geared press, deep draw press, knucle press	Hammer mill, forming press, forging press, header press
Paper industry dryer sections & calenders Consult factory			Fourdrinier to 500 FPM, paper mill plane & smoothing press	Fourdrinier to 1800 RPM press selections, calenders & dryers
Petroleum production		Drilling & service rig master clutches, compound clutches, rotary, drum		Mud pumps, PTO clutches
Rubber manufacturing	Transfer machines evenly loaded		Banberry mixer, drum mixer, extruder, calender	Centrifuge

Air Tube Disc Clutches and Brakes

Low Inertia and Very Low Inertia Clutches and Brakes



Operating Features

The Wichita Air-Tube Disc Clutch combines all the best features of the disc type clutch with all the advantages of direct air engagement. The simplest and most trouble-free method of applying air pressure is through direct axial pressure application by compressed air in a special composition full-circle tube.

Wichita Clutches engage smoothly without noise, shock or impact and release completely in a fraction of a second. Extremely fast action is possible because of the small volume of air required.

Clutches may be slipped moderately to control the acceleration rate.

When large inertia loads are powered from electric motors, smooth, controlled slip starts by Wichita Clutches can keep power demands below the allowed maximum.

Heat generated by controlled slipping or high cycle rate operation is dissipated by the centrifugal blower design of these units.

Wichita Low Inertia and Very Low Inertia Clutches and Brakes are designed to be completely free from effects of centrifugal force and self energization.

Torque developed is in direct proportion to air pressure applied.

These clutches and brakes interface well with automated controls through simple air and/or electric circuits.

Water cooled, copper disc clutches are available for use when power transmission needs require excessive or constant slipping which demands higher heat dissipation.

Wichita Clutches operate perfectly when teamed with Wichita Brakes in production situations requiring tension control, cyclic duty, or positioning.

Wichita Brakes have the same outstanding performance characteristics as Wichita Clutches.

Selection Requirements

The selection of a Low Inertia Brake is based on:

1. Torque required to stop a load.
2. Friction area necessary to absorb rotational energy.
3. Contact velocity of rotating discs.
4. Maximum bore capacity of unit.

Selection example

To properly select a Low Inertia Brake for a controlled deceleration application, the following information is needed:

Speed . . . . . 750 rpm
Shaft Dia. . . . . 5 In.
Inertia to Stop . . . . . 2,473 lb.ft.^{2}
Stop Time . . . . . 5 Sec.
Air Pressure Available . . . . 80 psi

Calculations

$$\text{Avg. hp} = \frac{WR^2 \times (\text{rpm})^2}{3.2 \times 10^6 \times \text{Stop Time}}$$

$$= \frac{2{,}473 \times (750)^2}{3.2 \times 10^6 \times 5 \text{ Sec.}} = 87 \text{ HP}$$

$$\text{Swept Friction Area} = \frac{\text{Avg. hp}}{\text{hp absorption rate for 5 seconds (see page 142)}}$$

$$= \frac{87 \text{ hp}}{0.43} = 202 \text{ in.}^2$$

$$\text{Torque} = \frac{WR^2 \times \text{rpm}}{25.5 \times \text{Stop Time}}$$

$$= \frac{2.473 \times 750}{25.5 \times 5}$$

$$= 14{,}547 \text{ lb.in.}$$

Using the above calculations, consult the Low Inertia Specifications Chart on pages 32 and 33.

Summary

As calculated, the torque required to stop the load in 5 seconds is 14,547 lb.in. Wichita Low Inertia Brakes are rated at 100 psi. This application has only 80 psi available.

To determine the torque rating of a Low Inertia brake at 80 psi apply the following formula:

Application: Torque for a Low Inertia Brake

$$= \frac{\text{Torque X Catalog Rated Pressure}}{\text{Available Air Pressure}}$$

$$= 14{,}547 \times \frac{100}{80} = 18{,}183 \text{ lb.in.}$$

Consult pages 32 and 33 for clutch and brake specifications. A Low Inertia model 114 Brake produces 27,625 lb.in. torque at 100 psi. However, the bore capacity is 4.125 inches. This application requires a 5 in. bore. Therefore, a Low Inertia 118 is to be investigated.

Catalog Torque Rating = 64,500 lb.in @ 100 psi
Maximum Bore Capacity = 5.25 in.
Catalog Swept Friction Area = 264 in.^{2}

Calculations show this application needs at least 202 In.^{2} to absorb the heat.

All of these ratings are acceptable for the given application data.

Next, check contact velocity of rotating discs.

$$= \frac{\text{Diameter of centerplate X rpm}}{3.82}$$

$$= \frac{18" \times 750}{3.82}$$

$$= 3{,}534 \text{ fpm}$$

Standard material is sufficient up to 6,000 fpm (see page 29). Dynamic balance is recommended above 3,500 fpm.

Therefore, a Low Inertia ATD-118 brake is the optimum choice for this application.

A Spring-Set Air Release Brake is also available (see page 52).

Note:
This application example is for preliminary sizing only. Contact a Wichita Sales Engineer or the factory for final selection.

Low Inertia and Very Low Inertia Clutches and Brakes

Specifications

Model Size ATD-	Slip Torque Lb. in at 100 PSI* .3 CF	Maximum Horsepower Per 100 RPM Duty A	B	C	D	Max Bore Rect. Key Inches	Recommended Clearances Inches	Swept Friction Area-In²
106	3,950	6.2	4.4	2.2	1.1	2	1/16-3/32	39
206	7,900	12.5	8.8	4.4	2.2	2	1/16-3/32	78
108	7,000	11.1	8	4	2	2-3/8	1/16-1/8	56
208	14,000	22.2	16	8	4	2-3/8	3/32-5/32	112
111	15,900	25	18	9	5	2-5/8	1/16-1/8	114
211	31,800	50	36	18	10	2-5/8	3/32-5/32	228
114	27,625	44	31	16	8	4-1/8	1/16-1/8	158
214	55,250	88	62	32	16	4-1/8	3/32-5/32	316
118	64,500	102	75	35	21	5-1/4	1/16-1/8	264
218	129,000	204	150	70	42	5-1/4	3/32-5/32	528
124H	153,700	243	180	90	40	7	3/32-5/32	574
224H	307,400	487	360	180	80	7	1/8-3/16	1,148
130H	327,000	519	380	190	100	8-1/2	3/32-5/32	827
230H	654,000	1038	760	380	200	8-1/2	1/8-3/16	1,654
136	508,000	805	600	295	165	10-1/2	3/32-5/32	1,150
236	1,016,000	1610	1200	590	330	10-1/2	1/8-3/16	2,300
142	726,000	1150	850	425	235	14	1/8-3/16	1,400
242	1,452,800	2300	1700	850	470	14	5/32-7/32	2,800
148	1,402,500	2225	1600	800	455	18	1/8-3/16	2,010
248	2,805,000	4450	3200	1600	915	18	5/32-7/32	4,020
260	5,950,000	9440	5950	3470	1940	19	3/16-5/16	7,230
360	8,925,000	14160	8925	5205	2910	19	1/4-3/8	10,845

*Max. recommended air pressure – 130 PSI.

Model No.	
Model Size	**Model Type**
ATD-xxx	LIC for Low Inertia Clutch
ATD-xxx	LIB for Low Inertia Brake
ATD-xxx	VLIC for Very Low Inertia Clutch
ATD-xxx	VLIB for Very Low Inertia Brake

Note: Very Low Inertia Clutches and Brakes are available in sizes from ATD-108 to ATD-224H.

Model Size ATD-	Low Inertia Clutches Total Wt. Lbs.	Total WR² #Ft.²	HUB & CP Wt. Lbs.	HUB & CP WR² #Ft.²	Effec. Wt.† Lbs.	Low Inertia Brakes Total Wt. Lbs.	HUB & CP Wt. Lbs.	HUB & CP WR² #Ft.²	Effect. Wt.† Lbs.
106	27.5	2.5	6.40	.24	5.67	25.5	6.40	.24	5.67
206	40.5	3.3	12.17	.46	10.01	38.5	12.17	.46	10.01
108	48.73	6.15	10.0	.55	8.50	46.23	10.0	.55	8.50
208	53.0	6.87	16.0	.72	11.0	50.5	16.0	.72	11.0
111	79.21	15.63	15.0	1.35	15.0	75.21	15.0	1.35	15.0
211	118.25	22.92	30.0	2.6	23.3	114.25	30.0	2.6	23.3
114	127	45	48	5.6	28.5	124	48	5.6	28.5
214	178	59	65	11	51.5	175	65	11	51.5
118	201	83	71	14.5	58	194	71	14.5	58
218	323	146	113	27.6	102	316	113	27.6	102
124H	504	399	131	50	120	496	131	50	120
224H	680	498	260	101	225	875	260	101	225
130H	685	922	212	129	178	643	212	129	178
230H	1146	1216	402	244	358	1004	402	244	358
136	1209	1842	351	325	364	1049	351	325	364
236	1822	2667	784	705	681	1642	784	705	681
142	1967	4721	680	705	438	1907	680	705	438
242	2732	5750	1197	1385	852	2528	1197	1385	852
148	3158	9325	1101	1785	779	3078	1101	1785	779
248	4700	13775	1942	3335	1465	4620	1942	3335	1465
260	9453	48733	2567	7077	3011	9261	2567	7077	3011
360	11643	57286	3870	10615	4373	11451	3870	10615	4373

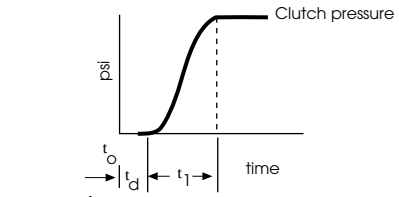
Model Size ATD-	Very Low Inertia Clutches Total Wt. Lbs.	Total WR² #Ft.²	HUB & DP Wt. Lbs.	HUB & DP WR² #Ft.²	Effec. Wt.† Lbs.	Very Low Inertia Brakes Total Wt. Lbs.	HUB & DP Wt. Lbs.	HUB & DP WR² #Ft.²	Effect. Wt.† Lbs.
108	47.15	6.06	6.7	.24	11.53	44.85	6.7	.24	11.53
208	65.16	8.17	12.9	.44	19.06	62.66	12.9	.44	19.06
111	79.8	15.99	9.6	.59	21.8	75.8	9.6	.59	21.8
211	115.5	23.47	18.6	1.15	40.6	111.55	18.6	1.15	40.6
114	126	37.4	20.4	2.25	31.5	123	20.4	2.25	31.5
214	180	56.2	39.8	4.44	58.5	177	39.8	4.44	58.5
118	195.4	75.5	40.0	7.7	64	188.4	40.0	7.7	64
218	299.6	141.4	75.0	14.7	120	292.6	75.0	14.7	120
124H	471.5	377	84.0	28.5	155	463.5	84.0	28.5	155
224H	632	551	150	54.9	197	624	150	54.9	197

Air system data

PSI pressure

Inflation

Clutch air pressure during inflation can be closely estimated by the following:



$t_1 = \left(\frac{3}{K}\right)^{\frac{1}{U}}$ sec. = Time to 95% full inflation

Clutch pressure = $P_1 \left(1 - \frac{1}{e^{K\bar{5}^U}}\right)$ psi (inflation)

This equation is accurate from 5% up to 95% P_1.

P_1 = Line pressure to clutch psi

K and U = coefficients for specific clutch and air pressure from Specification Table

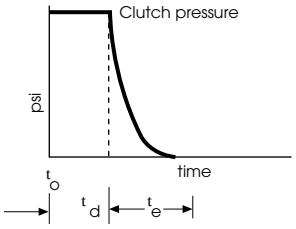
e = Naperian base log

$\bar{5}_o$ = Time at initiation of signal for inflation sec.

$\bar{5}_d$ = Time delay of air system – sec.

Exhaust

Clutch air pressure during exhaust can be closely estimated by the following:



Clutch pressure = $(P_1)(R)(E-\bar{5})^V$ psi (exhaust)

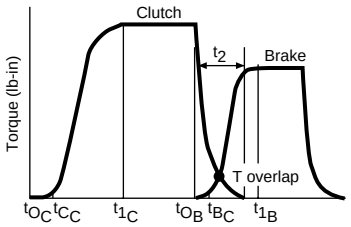
R, E and V = coefficients for specific clutch and air pressure from Specification Table.

$\bar{5}_e$ = Time to exhaust = E from Specification Table.

$\bar{5}$ = Time variable – seconds. In the exhaust equation "$\bar{5}$" cannot exceed the value of "E" sec.

Overlap

A typical clutch-brake torque curve for a single backshaft press (cyclic application) would appear as shown below.



Time (sec.)

$\bar{5}O_C$ = time at which disengaged clutch receives signal

$\bar{5}C_C$ = time of clutch engagement

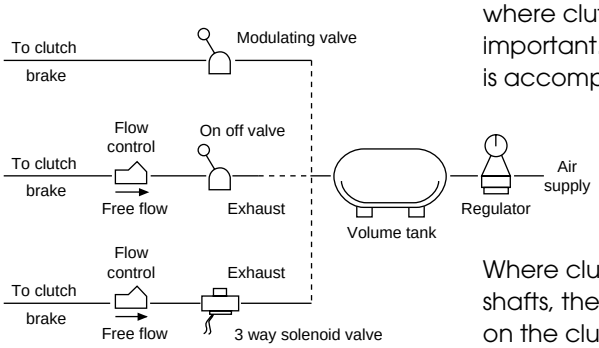
$\bar{5}1_C$ = time of clutch full inflation

$\bar{5}O_B$ = time at which disengaged brake receives signal

$\bar{5}B_C$ = time of brake engagement

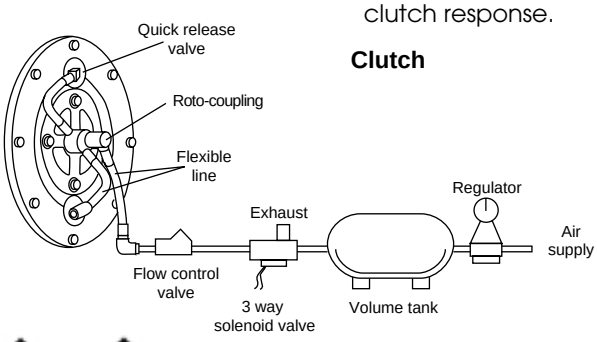
$\bar{5}1_B$ = time of brake full exhaust

$\bar{5}_2$ = overlap time at which clutch and brake are both engaged

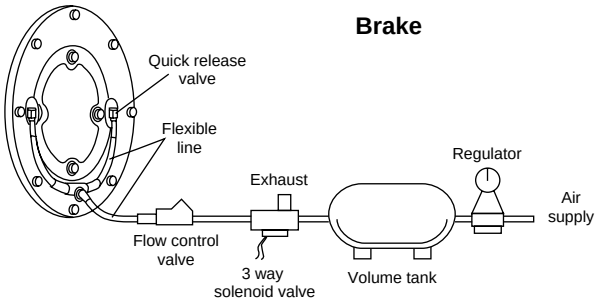


Shown are some of the air systems used on Wichita clutches. These systems are acceptable for remote operation where clutch reaction time is not important. Faster clutch reaction time is accomplished as indicated in the diagram by locating the flow control valve, if required, and the solenoid valve as close as possible to the roto-coupling. Where clutches are located on long shafts, the use of quick release valves on the clutch will facilitate faster clutch response.

Clutch



Brake



Low Inertia and Very Low Inertia Clutches and Brakes

Inflation Coefficients

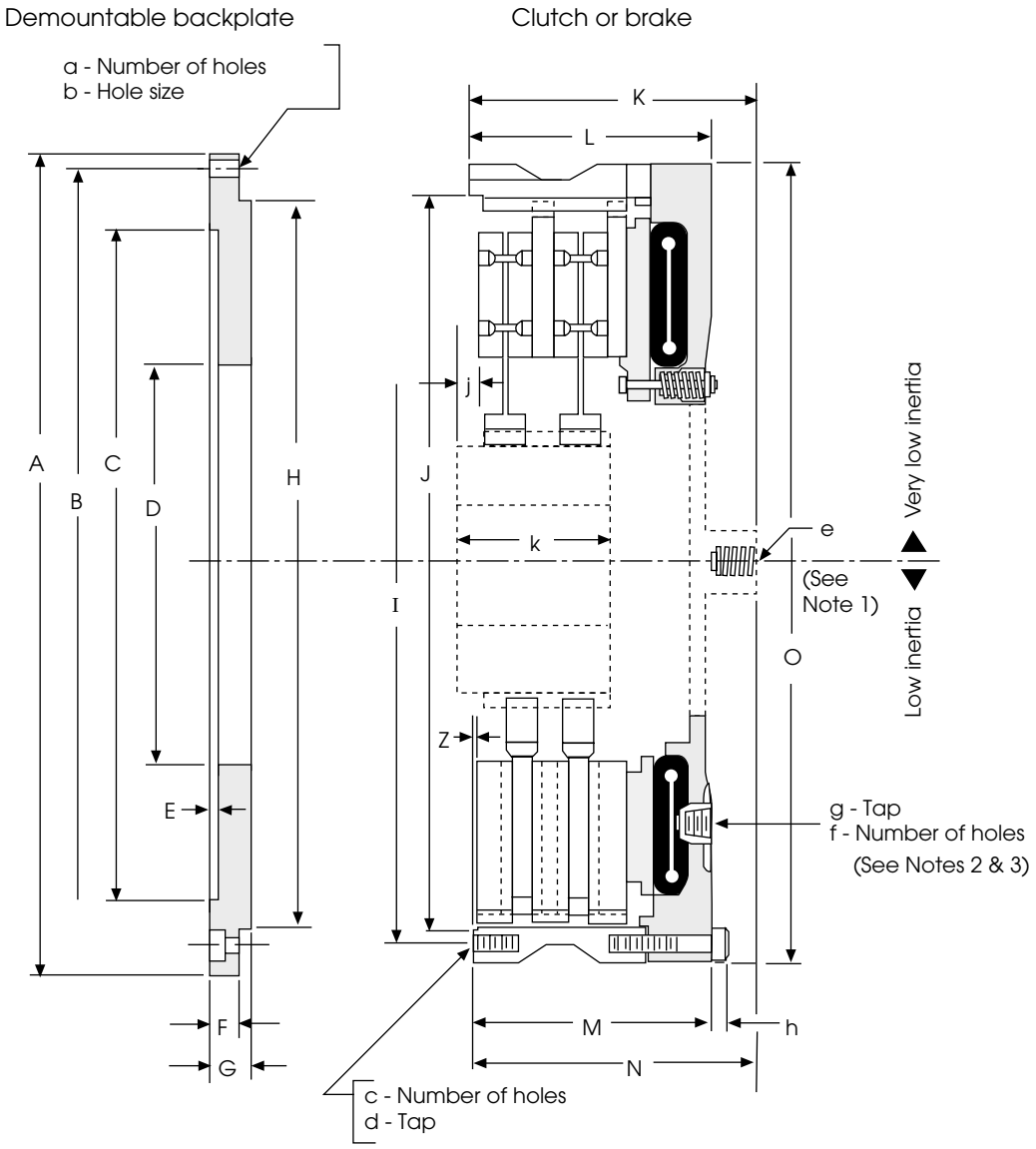
Model Size ATD-	Inflation Coefficients Operating Air Pressure					
	50 PSI		75 PSI		100 PSI	
	K	U	K	U	K	U
108	15,800	2.2	7,100	2	265	1.2
208	15,800	2.2	7,100	2	265	1.2
111	890	1.7	880	1.6	5,100	2.2
211	890	1.7	880	1.6	5,100	2.2
114	980	2.3	980	2.3	980	2.3
214	980	2.3	980	2.3	980	2.3
118	9,600	3.1	1,560	2.4	9,600	3.1
218	9,600	3.1	1,560	2.4	9,600	3.1
124H	145	1.8	90	1.6	87	1.6
224H	145	1.8	90	1.6	87	1.6
130H	185	2	150	2	93	1.8
230H	185	2	150	2	93	1.8
136	170	2	250	2.2	160	2
236	170	2	250	2.2	160	2
142	115	2	125	2	111	2
242	115	2	125	2	111	2
148	25	1.6	22	1.6	26	1.8
248	25	1.6	22	1.6	26	1.8
260	28	1.8	22	1.8	20	1.8
360	28	1.8	22	1.8	20	1.8

Exhaust Coefficients

Model Size ATD-	Exhaust Coefficients Operating Air Pressure								
	50 PSI			75 PSI			100 PSI		
	R	EV	R	E	V	R	R	E	V
108	60	.016	1.0	525	.02	1.6	240	.02	1.4
208	60	.016	1.0	525	.02	1.6	240	.02	1.4
111	1,000	.032	2	8,200	.04	2.8	4,930	.048	2.8
211	1,000	.032	2	8,200	.04	2.8	4,930	.048	2.8
114	720	.072	2.5	800	.069	2.5	1,840	.082	3
214	720	.072	2.5	800	.069	2.5	1,840	.082	3
118	44	.068	1.4	40	.072	1.4	34	.08	1.4
218	44	.068	1.4	40	.072	1.4	34	.08	1.4
124H	360	.096	2.5	240	.112	2.5	270	.136	2.8
224H	360	.096	2.5	240	.112	2.5	270	.136	2.8
130H	120	.104	2.1	140	.128	2.4	146	.158	2.7
230H	120	.104	2.1	140	.128	2.4	146	.158	2.7
136	124	.112	2.2	92	.128	2.2	76	.152	2.3
236	124	.112	2.2	92	.128	2.2	76	.152	2.3
142	132	.12	2.3	89	.144	2.3	61	.168	2.3
242	132	.12	2.3	89	.144	2.3	61	.168	2.3
148	20	.224	2	20	.256	2.2	19	.308	2.5
248	20	.224	2	20	.256	2.2	19	.308	2.5
260	24	.264	2.4	10	.367	2.3	9.9	.352	2.2
360	24	.264	2.4	10	.367	2.3	9.9	.352	2.2

Note: Very Low Inertia Clutches and Brakes are available in sizes from ATD-108 to ATD-224H. See page 32.

Low Inertia and Very Low Inertia Clutches and Brakes



Notes:

1. Roto-couplings, see page 59.
2. Quick Release Valves, see page 59.
3. Air Hose Kits, see page 39.
4. VLI Drive Plates available with bonded or riveted pads.

Dimensions (in)

(Consult factory for drawing before final layout.)

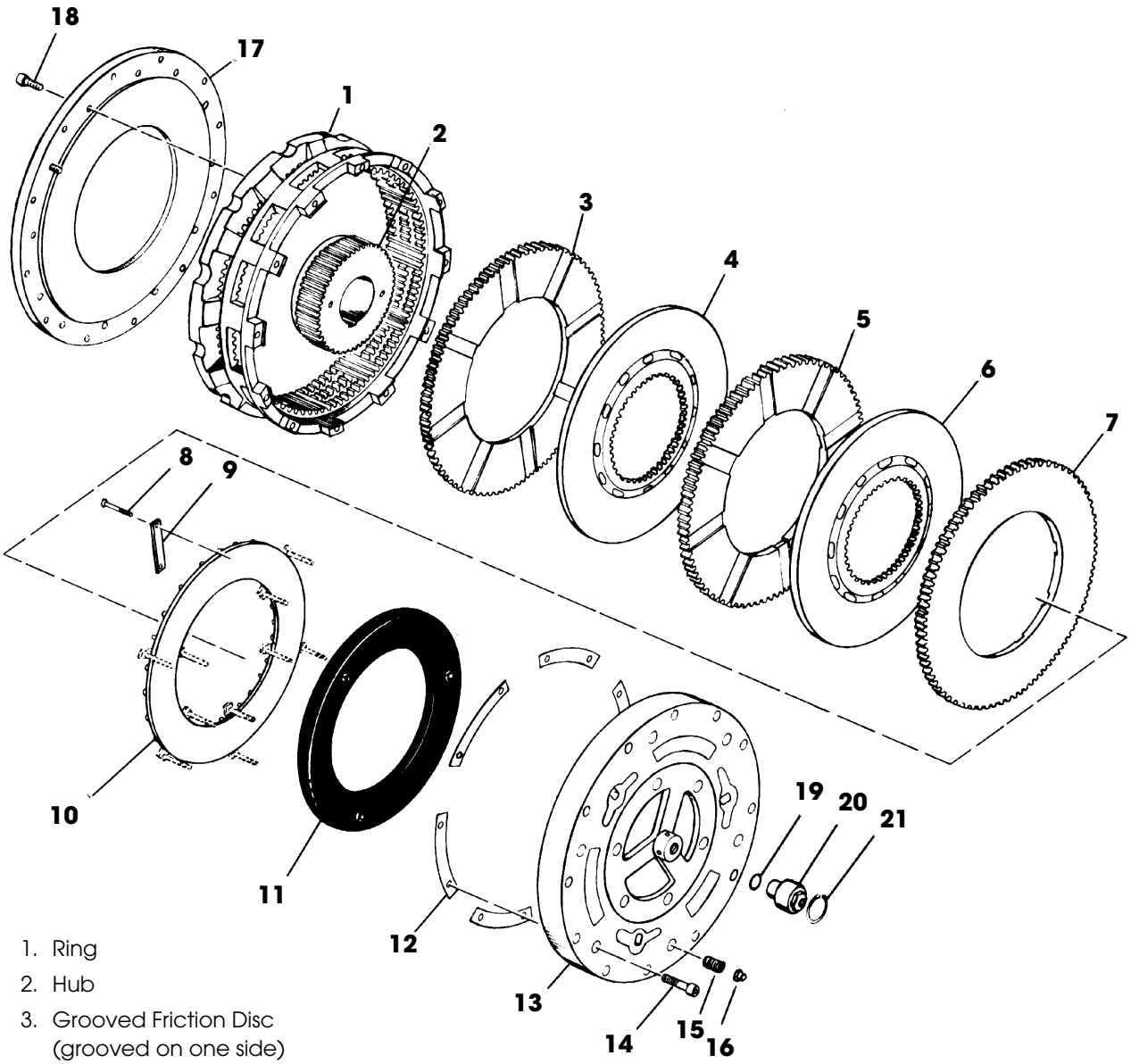
Model Size ATD-	A	B	C	D	E	F	G	H	I	J	K	L
106	8.75	8.000	7.377/7.379	4.19	.06	.562	.69	7.373/7.375	8.000	7.377/7.379	—	—
206	8.75	8.000	7.377/7.379	4.19	.06	.562	.69	7.373/7.375	8.000	7.377/7.379	—	—
108	12.12	11.125	8.375/8.378	5.38	.25	.875	1.00	9.281/9.284	10.187	9.285/9.288	4.25	3.75
208	12.12	11.125	8.375/8.378	5.38	.25	.875	1.00	9.281/9.284	10.187	9.285/9.288	5.50	4.75
111	16.00	14.750	11.375/11.378	7.00	.38	1.125	1.25	12.370/12.373	13.500	12.375/12.378	5.50	3.75
211	16.00	14.750	11.375/11.378	7.00	.38	1.125	1.25	12.370/12.373	13.500	12.375/12.378	7.38	5.63
114	18.75	17.500	14.375/14.378	9.43	.38	1.125	1.25	15.121/15.124	16.250	15.125/15.128	6.25	4.75
214	18.75	17.500	14.375/14.378	9.43	.38	1.125	1.25	15.121/15.124	16.250	15.125/15.128	8.25	6.75
118	23.25	22.000	18.250/18.253	12.50	.38	1.125	1.25	19.495/19.498	20.750	19.500/19.503	6.69	5.19
218	23.25	22.000	18.250/18.253	12.50	.38	1.125	1.25	19.495/19.498	20.750	19.500/19.503	9.00	7.50
124H	30.00	28.750	24.375/24.378	14.50	.25	1.125	1.25	25.497/25.499	26.750	25.500/25.503	7.63	6.13
224H	30.00	28.750	24.375/24.378	14.50	.25	1.125	1.25	25.497/25.499	26.750	25.500/25.503	10.31	8.81
130H	37.00	35.500	30.375/30.378	19.25	.25	1.250	1.43	32.118/32.123	33.250	32.125/32.128	—	—
230H	37.00	35.500	30.375/30.378	19.25	.25	1.250	1.43	32.118/32.123	33.250	32.125/32.128	—	—
136	43.50	42.000	36.375/36.378	23.63	.25	1.500	1.75	38.120/38.123	39.500	38.125/38.128	—	—
236	43.50	42.000	36.375/36.378	23.63	.25	1.500	1.75	38.120/38.123	39.500	38.125/38.128	—	—
142	52.00	49.250	44.625/44.628	29.50	.25	1.500	1.75	44.995/44.998	46.500	45.000/45.003	—	—
242	52.00	49.250	44.625/44.628	29.50	.25	1.500	1.75	44.995/44.998	46.500	45.000/45.003	—	—
148	61.00	58.000	52.000/52.005	32.00	.25	1.500	1.75	51.993/51.998	54.000	52.000/52.005	—	—
248	61.00	58.000	52.000/52.005	32.00	.25	1.500	1.75	51.993/51.998	54.000	52.000/52.005	—	—
260	78.50	74.5000	59.990/60.000	35.50	.38	3.25	3.50	62.740/62.745	66.500	62.750/62.760	—	—
360	78.50	74.5000	59.990/60.000	35.50	.38	3.25	3.50	62.740/62.745	66.500	62.750/62.760	—	—

Model Size ATD-	M	N	O	Z	a	b	c	d	e	f	g	h	j	k
106	3.19	4.63	8.81	.06	4	11/32	4	5/16-18	5/8-18	2	1/4"NPT	.31	.69	2.00
206	4.38	5.81	8.81	.06	4	11/32	4	5/16-18	5/8-18		1/4"NPT	.31	.69	3.25
108	4.50	4.38	11.13	.13	6	17/32	6	1/2-13	1"-14	2	1/2" NPT	.50	.50	1.50
208	4.88	6.63	11.13	.13	6	17/32	6	1/2-13	1"-14		1/2" NPT	.50	.50	2.87
111	3.88	5.63	14.75	.13	6	21/32	6	5/8-11	1"-14	2	1/2" NPT	.63	.75	2.00
211	5.63	7.38	14.75	.13	6	21/32	6	5/8-11	1"-14		1/2" NPT	.63	.75	3.75
114	4.63	6.13	17.50	.13	8	21/32	8	5/8-11	1"-14	2	1/2" NPT	.63	.88	2.25
214	6.63	8.13	17.50	.13	8	21/32	8	5/8-11	1"-14		1/2" NPT	.63	.88	4.25
118	5.63	7.13	22.00	.13	12	21/32	12	5/8-11	1"-14	3	1/2" NPT	.63	.81	2.75
218	7.38	8.88	22.00	.13	12	21/32	12	5/8-11	1"-14		1/2" NPT	.63	.81	4.75
124H	5.88	7.38	29.00	.13	12	21/32	12	5/8-11	1"-14	3	1/2" NPT	.63	.56	3.13
224H	8.75	10.13	29.00	.13	12	21/32	12	5/8-11	1"-14		1/2" NPT	.63	.56	5.13
130H	7.88	9.38	34.75	.19	18	25/32	18	3/4-10	1"-14	4	1/2" NPT	.75	.88	4.00
230H	9.88	11.38	34.75	.19	18	25/32	18	3/4-10	1"-14		1/2" NPT	.75	.88	6.25
136	10.69	10.50	41.00	.19	18	25/32	18	3/4-10	1 1/2-12	4	1/2" NPT	.75	.88	4.25
236	11.75	12.44	41.00	.19	18	25/32	18	3/4-10	1 1/2-12		1/2" NPT	.75	.88	7.50
142	8.38	9.25	49.00	.25	24	1-1/32	24	1-8	1 1/2-12	4	1/2" NPT	1.00	.75	5.62
242	12.13	13.00	49.00	.25	24	1-1/32	24	1-8	1 1/2-12		1/2" NPT	1.00	.75	7.50
148	9.13	13.13	56.75	.25	24	1-1/32	24	1-8	1" NPT	4	1/2" NPT	1.00	1.00	6.00
248	13.43	17.43	56.75	.25	24	1-1/32	24	1-8	1" NPT		1/2" NPT	1.00	1.00	8.75
260	18.00	20.38	70.50	.25	24	2" NC	24	2-4-1/2	2-1/2"	6	1/2" NPT	2.00	1.00	9.37
360	23.00	25.00	70.50	.25	24	2" NC	24	2-4-1/2	2-1/2"		1/2" NPT	2.00	1.00	14.13

Notes: Very Low Inertia Clutches and Brakes are available in sizes from ATD-108 to ATD-224H. See page 32.
For mounting, use socket head cap screws conforming to the ASTM-574-97a.

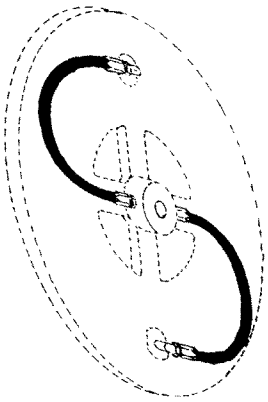
Low Inertia Clutches and Brakes

Component Parts

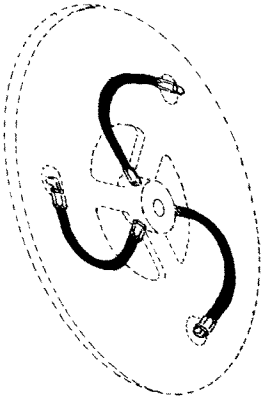


1. Ring
2. Hub
3. Grooved Friction Disc (grooved on one side)
4. Center Plate
5. Grooved Friction Disc (grooved on both sides)
6. Center Plate
7. Grooved Friction Disc (grooved on one side)
8. Hex Head Capscrews
9. Pressure Plate Lugs
10. Pressure Plate
11. Airtube
12. Shims
13. Airtube Holding Plate
14. Socket Head Capscrews
15. Release Springs
16. Flexloc Nuts
17. Demountable Back Plate
18. Socket Head Capscrews
19. "O" Ring
20. Roto-coupling
21. Snap Ring

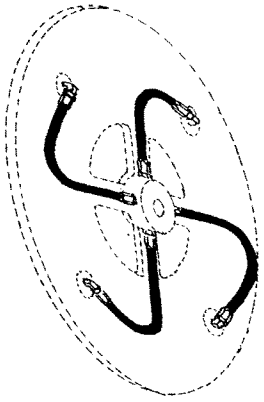
Air Hose Kits



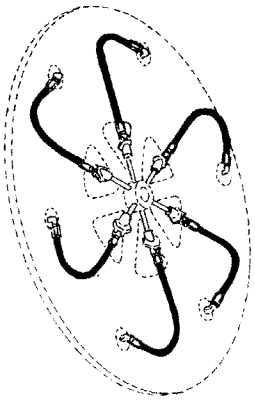
Size	Part Number
8"	8-908-812-200-5
	8-908-821-201-5 QRV
11"	8-911-812-201-5
	8-911-821-201-5 QRV
14"	8-914-812-200-5
	8-914-821-200-5 QRV



Size	Part Number
18"	8-918-812-301-5
	8-918-821-300-5 QRV
24"H	8-924-812-300-5
	8-924-821-301-5 QRV



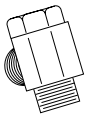
Size	Part Number
30"	8-930-812-400-5
	8-930-821-400-5 QRV
36"	8-936-821-400-5 QRV
42"	8-942-821-400-5 QRV
48"	8-948-821-400-5 QRV



Size	Part Number
60"	8-960-800-500-7 QRV

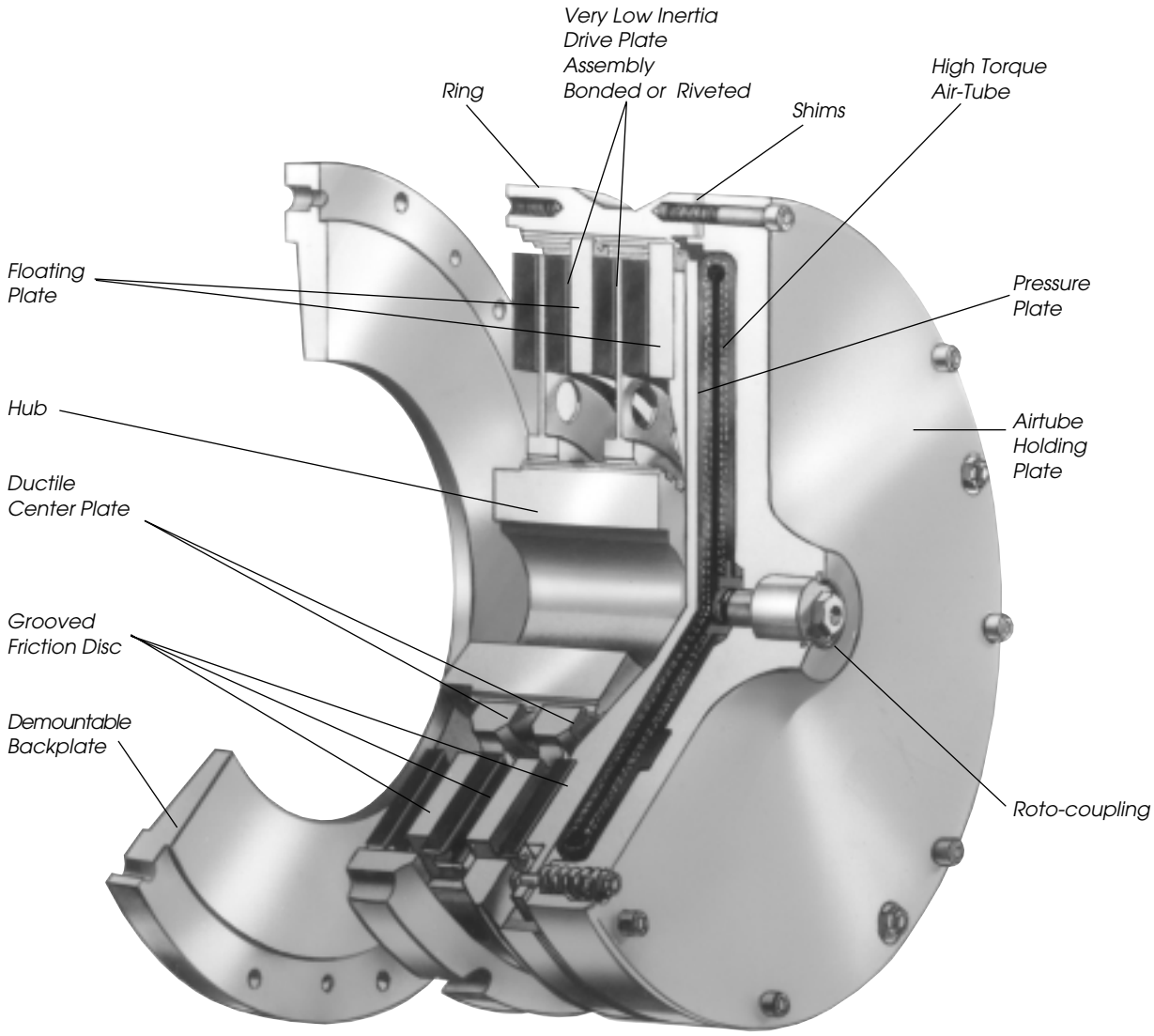
Air hose kits contain all necessary parts (fittings, hoses and extensions) to completely plumb the clutch air system.

Optional Quick Release Valves can replace elbows on most units (see page 59).



Roto-couplings (see page 59).

High Torque Clutches



Wichita High Torque Clutches provide the highest torque to size ratios of any Wichita Clutch. They provide smooth controlled starts and stops and are designed for minimum power loss due to low rotating inertia.

- Extremely fast response
- No lubrication
- High torque to size ratio
- Low rotating inertia

Selection Requirements

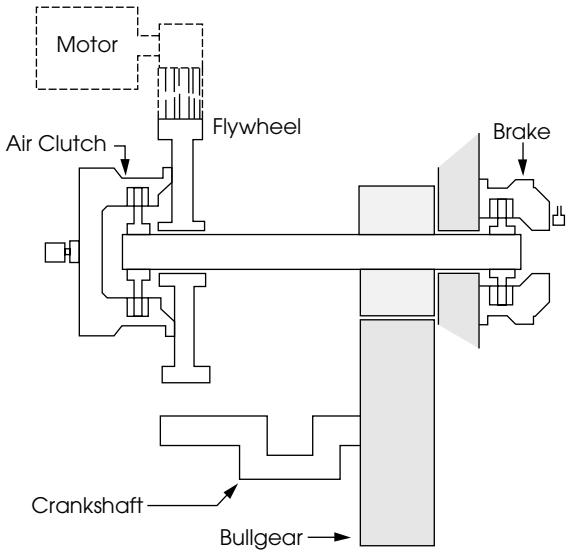
To properly select a High Torque Clutch and Low Inertia Brake, the following information must be determined.

1. Torque necessary to do the work (clutch).
2. Rotating inertia to be stopped and started.
3. Heat generated by each stop/start.
4. Torque necessary to stop inertia (brake).
5. Shaft size.

Selection example

Data

Rated Tonnage	As Required
Crankshaft Speed	30 rpm (Continuous Run)
Clutch-Brake Shaft rpm	204 rpm
Crankshaft Speed	30 rpm
Degrees of Crank to start	90°
Degrees of Crank to stop	90°
Connecting Rod Length = b	36 in.
Stroke	6 in.
1/2 of Press Stroke (throw) = a	3 in.
WR^2 of Parts on Backshaft	78.2 lb.ft.^{2}
WR^2 of Parts on Crankshaft	39,091 lb.ft.^{2}
Material Shear Stress	45,000 psi
Blade Width	60 in.
Shaft Size	4 in.
Maximum Material to be Sheared	x
Air Pressure Available	100 psi



Calculations

Torque @ Crank

= (Material Shear Stress) (x) (Blade Width) (Torque Arm)

Torque arm = y = (x) (tan α)

c = a + b – x
= 3 + 36 – .25
= 38.75 in.

Cos α

$$= \frac{b^2 + c^2 - a^2}{2\,bc}$$

$$= \frac{(36)^2 + (38.75)^2 - (3)^2}{(2)\,(36)\,(38.75)}$$

= .99948

α = 1.8478°

Torque Arm = y = (c) (tan α)
= (38.75) (tan 1.8478°)
= (38.75) (.03226)
= 1.25 in.

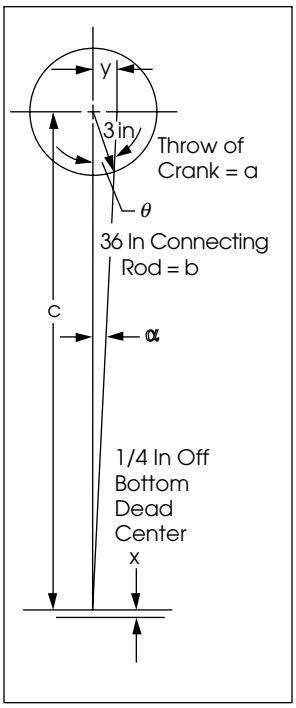
Torque @ Crank
= (Material Shear Stress) (x) (Blade Width) (Torque Arm)
= (45,000) (.25) (60) (1.25)
= 843,750 lb.in.

Torque @ Clutch

$$= (\text{Torque @ Crank}) \div \frac{\text{Clutch rpm}}{\text{Crankshaft rpm}}$$

$$= 843{,}750 \div \frac{204\ \text{rpm}}{30\ \text{rpm}}$$

= 124,081 lb.in.



High Torque Clutches

Clutch Selection

Per the application factors on page 29 a "Back Geared Press is 'Group C'."

$$\frac{hp}{100\ rpm} = \frac{Torque}{630} = \frac{124{,}081}{630} = 197$$

The preliminary clutch selection based on 124,081 lb.in. and 197 hp/100 rpm is an ATD-224 Low Inertia High Torque Clutch. (page 41)

A Low Inertia High Torque Clutch was chosen because of the continuous duty (non-cyclic) operation having a relatively low heat hp requirement.

ATD-224 Low Inertia High Torque Clutch =

280 hp/100 rpm

Rated Torque = 480,000 lb.in @ 100 psi

Required clutch air pressure is:

$$psi = \frac{\text{clutch required torque x (100 psi)}}{\text{Catalog rated torque @ 100 psi}}$$

Actual required clutch psi

$$psi = \frac{124{,}081}{480{,}000} \times (100\ psi)$$

= 26 psi minimum is required.

This application has 100 psi available.

Contact velocity of rotating disc is:

$$V_c = \frac{(\text{Diameter of Center Plate})\ (\pi)\ (rpm)}{12\ in.ft.}$$

$$= \frac{24}{12}\ (\pi)\ (204) = 1{,}282\ \frac{ft.}{min.}$$

(Ductile iron is not required, see page 29).

Maximum bore for ATD-224 High Torque Low Inertia Clutch = 7 in.

Check clutch inflation time for 90˚ start angle (see page 46, psi pressure curves)

Estimated time to start

$$= \frac{\text{Start Angle}}{360^\circ}\ \frac{60}{\text{Crankshaft rpm}}$$

$$= \frac{90^\circ}{360^\circ}\ \frac{60}{30} = 0.5\ Sec.$$

P_1 = Line pressure to clutch.
P_2 = Required pressure to clutch.
LN = Natural log.
k = Inflation coefficient (ATD-224 H.T. @ 100 psi).
= 2,600
u = For ATD-224 H.T. Clutch @ 100 psi
= 2.5

Time to 26% of line pressure.

$$\bar{5} = \left(\frac{LN\ \left(\frac{P_1}{P_1 - P_2}\right)}{k} \right)^{\frac{1}{u}}$$

$$\bar{5} = \left(\frac{LN\ \left(\frac{100}{100 - 26}\right)}{2{,}600} \right)^{\frac{1}{2.5}}$$

= 0.027 seconds

Clutch will be fully inflated at 90˚ of crankshaft rotation.

Clutch exhaust time @ 100 psi = E = .078 (page 46).

Note:
This application example is for preliminary sizing only. Contact a Wichita Sales Engineer or the factory for final selection.

Low Inertia Brake Selection

To properly size a brake, the total rotating inertia reflected to the clutch and brake shaft must be known.

Alternate shaft WR^2 referred to clutch shaft

$$= \frac{\text{Alternate}}{\text{shaft } WR^2} \left(\frac{\text{Alternate shaft rpm}}{\text{clutch shaft rpm}}\right)^2$$

$$= 39{,}091 \left(\frac{30}{204}\right)^2$$

WR^2 referred to clutch-brake shaft = 845.4 lb.ft^2 @204 rpm

Total inertia Back shaft WR^2 = 78.2 lb.ft.^{2}

Clutch hub & drive plate WR^2 from Specification Table = 101.0 lb.ft.^{2}

Estimate brake WR^2 (assume same as clutch) = 101.0 lb.ft.^{2}

Total WR^2 referred to clutch-brake = 1,125.66 lb.ft.^{2} (Estimated)

Estimated time to stop:

$$= \left(\frac{\text{Start Angle}}{360°}\right)\left(\frac{60}{\text{Crankshaft rpm}}\right)$$

$$= \left(\frac{90°}{360°}\right)\left(\frac{60}{30}\right) = .5 \text{ Sec.}$$

The deceleration torque is

$$T = 12\left(\frac{WR^2}{32.2}\right)\left(\frac{\text{Brake rpm}}{9.5(t)}\right)$$

$$= 12\left(\frac{1125.6}{32.2}\right)\left(\frac{204}{9.5\ (.5)}\right)$$

Deceleration Torque = 18,015 lb. in.

The hp / 100 rpm for this application is:

$$\frac{hp}{100 \text{ rpm}} = \frac{\text{Torque (lb.in.)}}{630} = \frac{18{,}015}{630} = 29 \text{ hp / 100 rpm}$$

Consult the Specification Table on page 32 to select a brake based on torque and hp/100 rpm. Under "Duty C", an ATD-214 brake has 32 hp/100 capacity and 55,250 lb.in. torque. The rotating inertia of an ATD-214 Low Inertia Brake is 11 lb.ft.^{2}. Therefore, the actual rotating inertia reflected to brake is 1035.6 lb.ft.^{2}.

The actual deceleration torque $= 12\left(\frac{1035.6}{32.2}\right)\left(\frac{204}{9.5}\right)$
$= 16{,}575$ lb.in.

Required air pressure is:

Brake $= \frac{\text{Brake required torque x (100 psi)}}{\text{Catalog rated torque @ 100 psi}}$

$= \frac{16{,}575 \text{ lb.in.}}{55{,}250 \text{ lb.in.}} \times 100$

= 30 psi minimum

This application has 100 psi available.

The average heat hp each stop

$= \frac{(\text{Brake Torque})}{63{,}000} \times \text{rpm} \times 1/2$

$= \frac{16{,}575}{63{,}000} \times 204 \times .5$

= 26.8 hp

Friction area necessary to absorb heat $= \frac{\text{heat hp}}{\text{Absorbtion rate for .5 sec (see page 142)}}$

$= \frac{\text{Heat hp}}{.7} = \frac{26.8}{.7} = 39 \text{ in.}^2$

An ATD-214 Low Inertia Brake has 316 in.^{2} of friction lining available to absorb heat generated by stopping. Maximum bore for an ATD-214 Low Inertia Brake is 4-1/8 inches.

Based on the given application data and the following calculations, an ATD-224 Low Inertia High Torque Clutch and ATD-214 Low Inertia Brake have been selected as having sufficient torque and heat dissipation capacity with minimum diameter and sufficient bore capacity.

Note:
These application examples are for preliminary sizing only. Contact a Wichita Sales Engineer or the factory for final selection.

High Torque Clutches

Specifications

Model Size ATD-	Slip Torque Lb. In At 100 PSI* .3CF	Maximum Horsepower Per 100 RPM Duty				Max. Bore Rect. Key Inches	Recommended Clearances Inches	Swept Friction Area In.²	Air-Tube Volume In.³	
		A	B	C	D				New Lining	Worn Lining
106	5,000	8	5.7	2.8	1.4	2	1/16-3/32	39	3	14
206	10,000	16	11.4	5.7	2.8	2	1/16-3/32	78	4	14
108	11,000	17	12.5	6.2	3.1	2-3/8	1/16-1/8	56	5	30
208	22,000	34	25	12.5	6.2	2-3/8	3/32-5/32	112	7	30
111	25,000	38	28	14	7	2-5/8	1/16-1/8	114	8	48
211	50,000	76	56	28	14	2-5/8	3/32-5/32	228	11	48
114	48,000	75	55	27	14	4-1/8	1/16-1/8	158	12	75
214	96,000	160	114	55	28	4-1/8	3/32-5/32	316	17	75
118	105,000	165	120	60	30	5-1/4	1/16-1/8	264	20	140
218	210,000	330	240	120	60	5-1/4	3/32-5/32	528	35	140
124	240,000	385	280	140	70	7	3/32-5/32	574	50	250
224	480,000	770	560	280	140	7	1/8-3/16	1,148	75	250
130	470,000	750	535	270	135	8-1/2	3/32-5/32	827	80	395
230	940,000	1500	1070	540	270	8-1/2	1/8-3/16	1,654	120	395
136	940,000	1555	1120	560	280	10-1/2	3/32-5/32	1,150	120	770
236	1,880,000	3100	2240	1120	560	10-1/2	1/8-3/16	2,300	150	770
148	2,360,000	3745	2690	1345	670	18	1/8-3/16	2,010	200	1430
248	4,720,000	7490	5380	2690	1345	18	5/32-7/32	4,020	300	1430
260	8,300,000	13000	8000	4000	2000	19	3/16-5/16	7,230	650	2600
360	12,450,000	19700	12000	6000	3000	19	1/4-3/8	10,845	800	2600

*Max. recommended air pressure — 100 PSI.

Model No.	
Model Size	**Model Type**
ATD-xxx	LI-HTC for Low Inertia High Torque Clutch
ATD-xxx	VLI-HTC for Very Low Inertia High Torque Clutch

Note: Very Low Inertia High Torque Clutches are available in sizes from ATD-108 to ATD-224.

Model Size ATD-	Low Inertia High Torque Total Wt. Lbs.	Total WR² #Ft.²	HUB & CP Wt. Lbs.	HUB & CP WR² #Ft.²	Effec. Wt.† Lbs.	Very Low Inertia High Torque Total Wt. Lbs.	Total WR² #Ft.²	HUB & DP Wt. Lbs.	HUB & DP WR² #Ft.²	Effec. Wt. † Lbs.
106	22.5	1.4	6.40	.24	6.99	—	—	—	—	—
206	37.7	2.8	12.7	.46	11.38	—	—	—	—	—
108	60.78	7.33	10.0	.55	12.80	59.2	7.24	8.2	.74	15.83
208	79.05	9.65	16.0	.72	19.30	77.21	9.35	15.3	1.5	23.36
111	109.4	21.43	15.0	1.35	21.35	110.1	21.79	14.0	.83	28.15
211	148.44	28.72	30.0	2.60	39.65	145.74	29.27	26.0	1.60	46.95
114	120	31	48	5.6	35	119	23.6	30.4	2.7	38
214	171	45	65	11	59	146	34.2	51.8	5.2	52
118	284	108	71	14.5	91	278.4	100.5	44.4	7.5	67
218	406	177	113	27.6	133	382.6	166.4	66.6	13.4	151
124	599	431	131	50	196	566.5	409	107.5	27	231
224	783	530	260	101	301	727	494	181	41	273
130	1099	1424	212	129	348	—	—	—	—	—
230	1460	1718	402	244	528	—	—	—	—	—
136	1762	2554	351	325	620	—	—	—	—	—
236	2375	3513	784	705	937	—	—	—	—	—
148	5471	15245	1101	1785	1773	—	—	—	—	—
248	6802	19150	1942	3335	2459	—	—	—	—	—
260	11853	55048	2567	7077	4374	—	—	—	—	—
360	14043	63601	3870	10615	4886	—	—	—	—	—

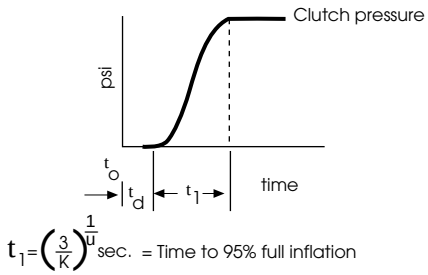
† Weight of internal clutch parts for use in calculating clutch engagement time.

Air system data

PSI pressure

Inflation

Clutch air pressure during inflation can be closely estimated by the following:



$t_1 = \left(\frac{3}{K}\right)^{\frac{1}{U}}$ sec. = Time to 95% full inflation

Clutch pressure = $P_1 \left(1 - \frac{1}{e^{K\bar{5}^U}}\right)$ psi

(inflation)

This equation is accurate from 5% up to 95% P_1.

P_1 = Line pressure to clutch psi

K and U = coefficients for specific clutch and air pressure from Specification Table on page 51.

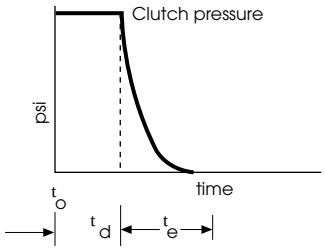
e = Naperian base log

$\bar{5}_o$ = Time at initiation of signal for inflation sec.

$\bar{5}_d$ = Time delay of air system – sec.

Exhaust

Clutch air pressure during exhaust can be closely estimated by the following:



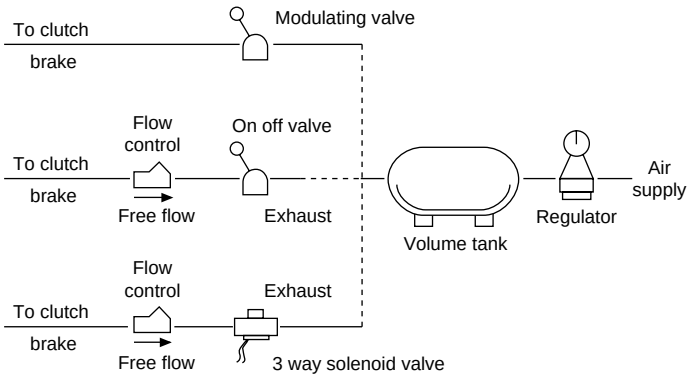
Clutch pressure = $(P_1)(R)(E\bar{5})^V$ psi

(exhaust)

R, E and V = coefficients for specific clutch and air pressure from Specification Table on page 51.

$\bar{5}_e$ = Time to exhaust = E from Specification Table on page 51.

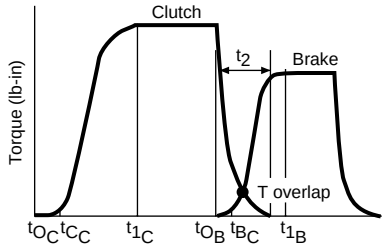
$\bar{5}$ = Time variable – seconds. In the exhaust equation "$\bar{5}$" cannot exceed the value of "E" sec.



Shown are some of the air systems used on Wichita clutches. These systems are acceptable for remote operation where clutch reaction time is not important. Faster clutch reaction time is accomplished as indicated in the diagram by locating the flow control valve, if required, and the solenoid valve as close as possible to the roto-coupling. Where clutches are located on long shafts, the use of quick release valves on the clutch will facilitate faster clutch response.

Overlap

A typical clutch-brake torque curve for a single backshaft press (cyclic application) would appear as shown below.



Time (sec.)

t_{OC} = time at which disengaged clutch receives signal

t_{CC} = time of clutch engagement

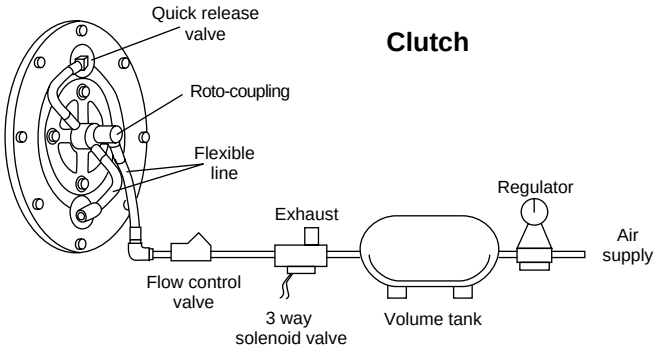
t_{1C} = time of clutch full inflation

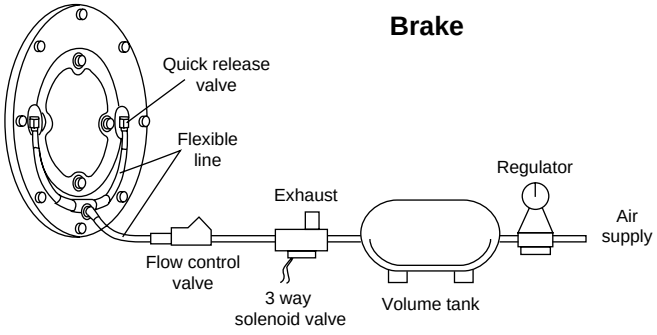
t_{OB} = time at which disengaged brake receives signal

t_{BC} = time of brake engagement

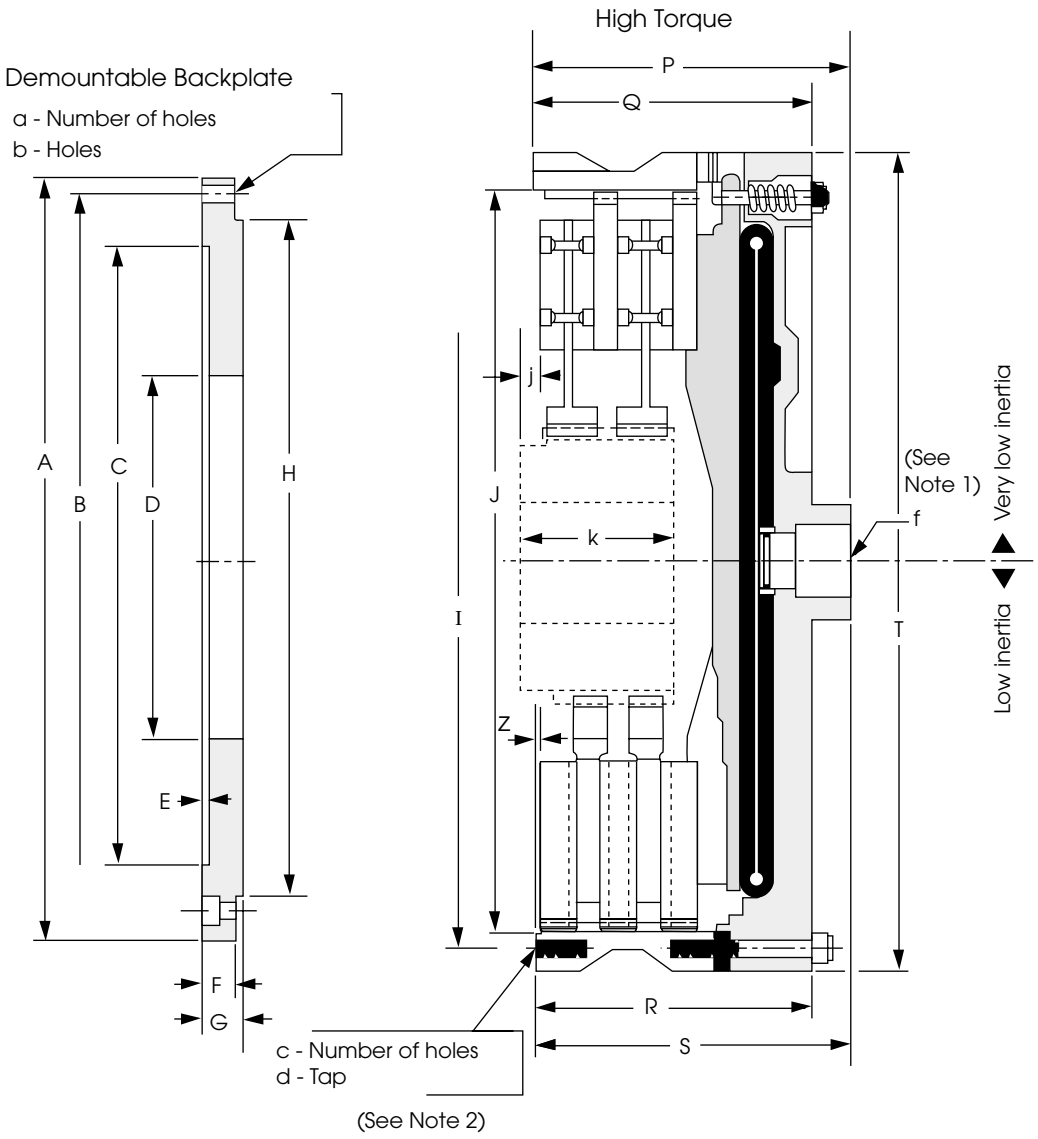
t_{1B} = time of brake full exhaust

t_2 = overlap time at which clutch and brake are both engaged





High Torque Clutches



Notes:

1. Roto-couplings, see page 59.
2. Quick Release Valves, see page 59.
3. VLI Drive Plates available with bonded or riveted pads.

Dimensions (in)

(Consult factory for drawing before final layout.)

Model Size ATD-	A	B	C	D	E	F	G	H	I	J
106	8.75	8.000	7.377/7.379	4.19	.06	.562	.69	7.373/7.375	8.000	7.377/7.379
206	8.75	8.000	7.377/7.379	4.19	.06	.562	.69	7.373/7.375	8.000	7.377/7.379
108	12.12	11.125	8.375/8.378	5.38	.25	.875	1.00	9.281/9.284	10.187	9.285/9.288
208	12.12	11.125	8.375/8.378	5.38	.25	.875	1.00	9.281/9.284	10.187	9.285/9.288
111	16.00	14.750	11.375/11.378	7.00	.38	1.125	1.25	12.370/12.373	13.500	12.375/12.378
211	16.00	14.750	11.375/11.378	7.00	.38	1.125	1.25	12.370/12.373	13.500	12.375/12.378
114	18.75	17.500	14.375/14.378	9.43	.38	1.125	1.25	15.121/15.124	16.250	15.125/15.128
214	18.75	17.500	14.375/14.378	9.43	.38	1.125	1.25	15.121/15.124	16.250	15.125/15.128
118	23.25	22.000	18.250/18.253	12.50	.38	1.125	1.25	19.495/19.498	20.750	19.500/19.503
218	23.25	22.000	18.250/18.253	12.50	.38	1.125	1.25	19.495/19.498	20.750	19.500/19.503
124	30.00	28.750	24.375/24.378	14.50	.25	1.125	1.25	25.497/25.499	26.750	25.500/25.503
224	30.00	28.750	24.375/24.378	14.50	.25	1.125	1.25	25.497/25.499	26.750	25.500/25.503
130	37.00	35.500	30.375/30.378	19.25	.25	1.250	1.43	32.118/32.123	33.250	32.125/32.128
230	37.00	35.500	30.375/30.378	19.25	.25	1.250	1.43	32.118/32.123	33.250	32.125/32.128
136	43.50	42.000	36.375/36.378	23.63	.25	1.500	1.75	38.120/38.123	39.75	38.125/38.128
236	43.50	42.000	36.375/36.378	23.63	.25	1.500	1.75	38.120/38.123	39.75	38.125/38.128
148	61.00	58.000	52.000/52.005	32.00	.25	1.500	1.75	51.993/51.998	54.000	52.000/52.005
248	61.00	58.000	52.000/52.005	32.00	.25	1.500	1.75	51.993/51.998	54.000	52.000/52.005
260	—	—	62.750/62.760	36.00	.25	—	—	62.740/62.745	66.500	62.750/62.760
360	—	—	62.750/62.760	36.00	.25	—	—	62.740/62.745	66.500	62.750/62.760

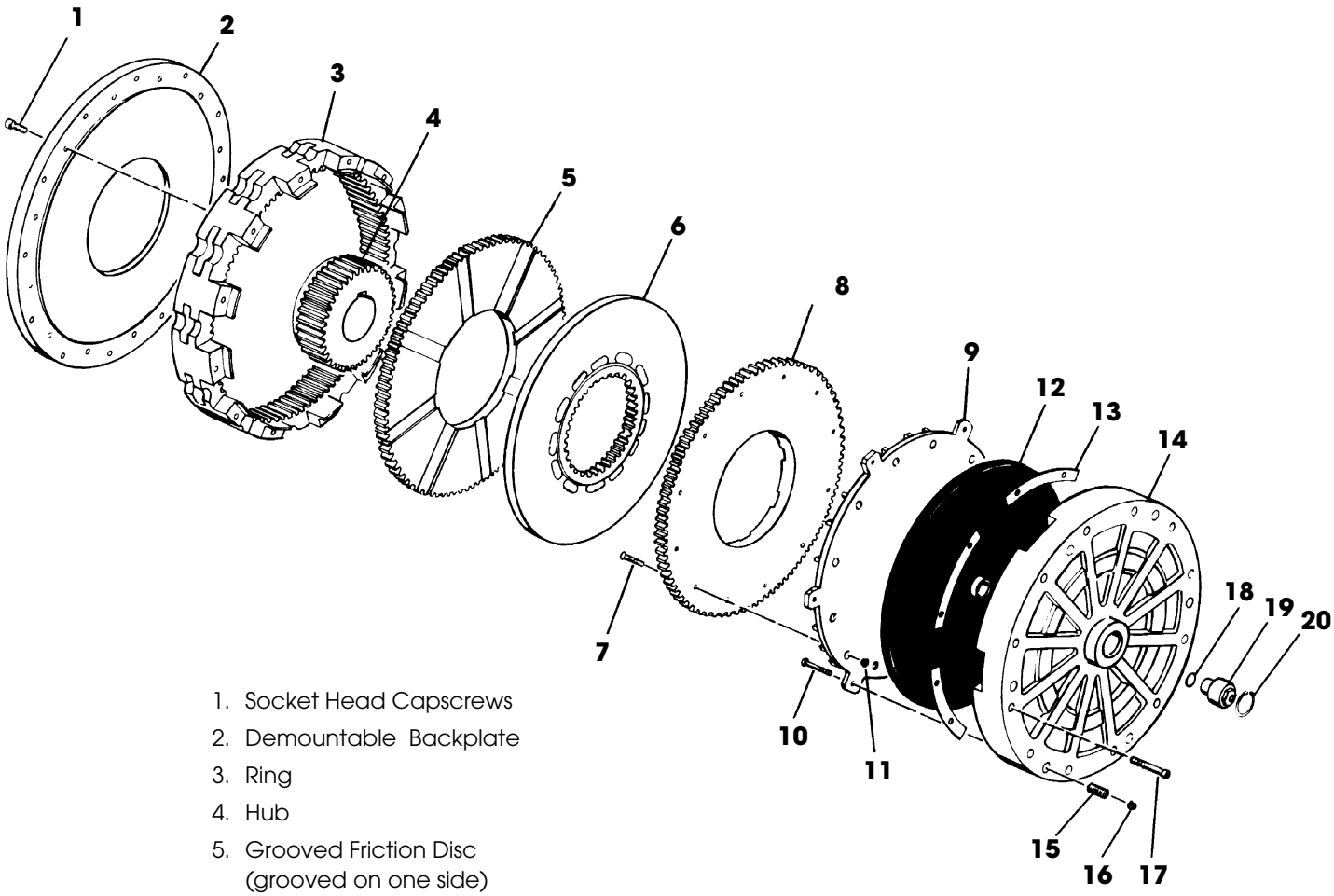
Model Size ATD-	P	Q	R	S	T	Z	a	b	c	d	f	j	k
106	—	—	4.00	4.50	8.81	.06	4	11/32	4	5/16-18	5/8-18	.69	2.00
206	—	—	5.19	5.69	8.81	.06	4	11/32	4	5/16-18	5/8-18	.69	3.25
108	4.31	3.68	3.63	5.25	11.13	.13	6	17/32	6	1/2-13	1/4" NPT	.50	1.50
208	5.56	4.93	4.88	6.50	11.13	.13	6	17/32	6	1/2-13	1/4" NPT	.50	2.87
111	6.63	4.50	4.38	6.50	14.75	.13	6	21/32	6	5/8-11	1/2" NPT	.75	2.00
211	8.25	6.13	6.13	8.25	14.75	.13	6	21/32	6	5/8-11	1/2" NPT	.75	3.75
114	7.18	5.13	4.81	6.96	17.50	.13	8	21/32	8	5/8-11	1/2" NPT	.88	2.25
214	9.13	7.06	6.94	9.00	17.50	.13	8	21/32	8	5/8-11	1/2" NPT	.88	4.25
118	—	5.90	6.09	7.96	22.00	.13	12	21/32	12	5/8-11	1/2" NPT	.81	2.75
218	—	8.03	7.91	9.78	22.00	.13	12	21/32	12	5/8-11	1/2" NPT	.81	4.75
124	8.38	6.81	7.00	8.43	29.00	.13	12	21/32	12	5/8-11	1/2" NPT	.56	3.13
224	10.94	9.50	9.43	10.88	29.00	.13	12	21/32	12	5/8-11	1/2" NPT	.56	5.13
130	—	—	9.25	16.06*	36.13	.19	18	25/32	18	3/4-10	1-1/2"-12	.88	5.00
230	—	—	10.31	18.06*	36.13	.19	18	25/32	18	3/4-10	1-1/2"-12	.88	7.13
136	—	—	10.31	18.87*	41.50	.19	18	1-1/32	18	3/4-10	2" NPT	.88	4.25
236	—	—	13.56	22.13*	41.50	.19	18	1-1/32	18	3/4-10	2" NPT	.88	7.50
148	—	—	15.44	24.00*	59.00	.25	24	1-1/32	24	1-8	2" NPT	1.00	6.00
248	—	—	19.75	28.31*	59.00	.25	24	1-1/32	24	1-8	2" NPT	1.00	8.75
260	—	—	—	—	—	.25	24	2" NC	24	2-4-1/2	2-1/2" NPT	1.00	9.37
360	—	—	—	—	—	.25	24	2" NC	24	2-4-1/2	2-1/2" NPT	1.00	14.13

‡ 30" sizes and larger furnished with external roto-coupling.

Notes: Very Low Inertia High Torque Clutches are available in sizes from ATD-108 to ATD-224. See page 32.
For mounting, use socket head cap screws conforming to the ASTM-574-97a.

High Torque Clutches

Component Parts



1. Socket Head Capscrews
2. Demountable Backplate
3. Ring
4. Hub
5. Grooved Friction Disc (grooved on one side)
6. Center Plate
7. Flathead Socket Capscrew
8. Grooved Friction Disc
9. Pressure Plate
10. Hex Head Capscrew
11. Slotted Flush Nut
12. Pancake Air Tube
13. Shims
14. Air Tube Holding Plate
15. Release Springs
16. Flexloc Nut
17. Socket Head Capscrews
18. "O" Ring
19. Internal Roto-Coupling
20. Snap Ring

High Torque Clutches

Inflation Coefficients

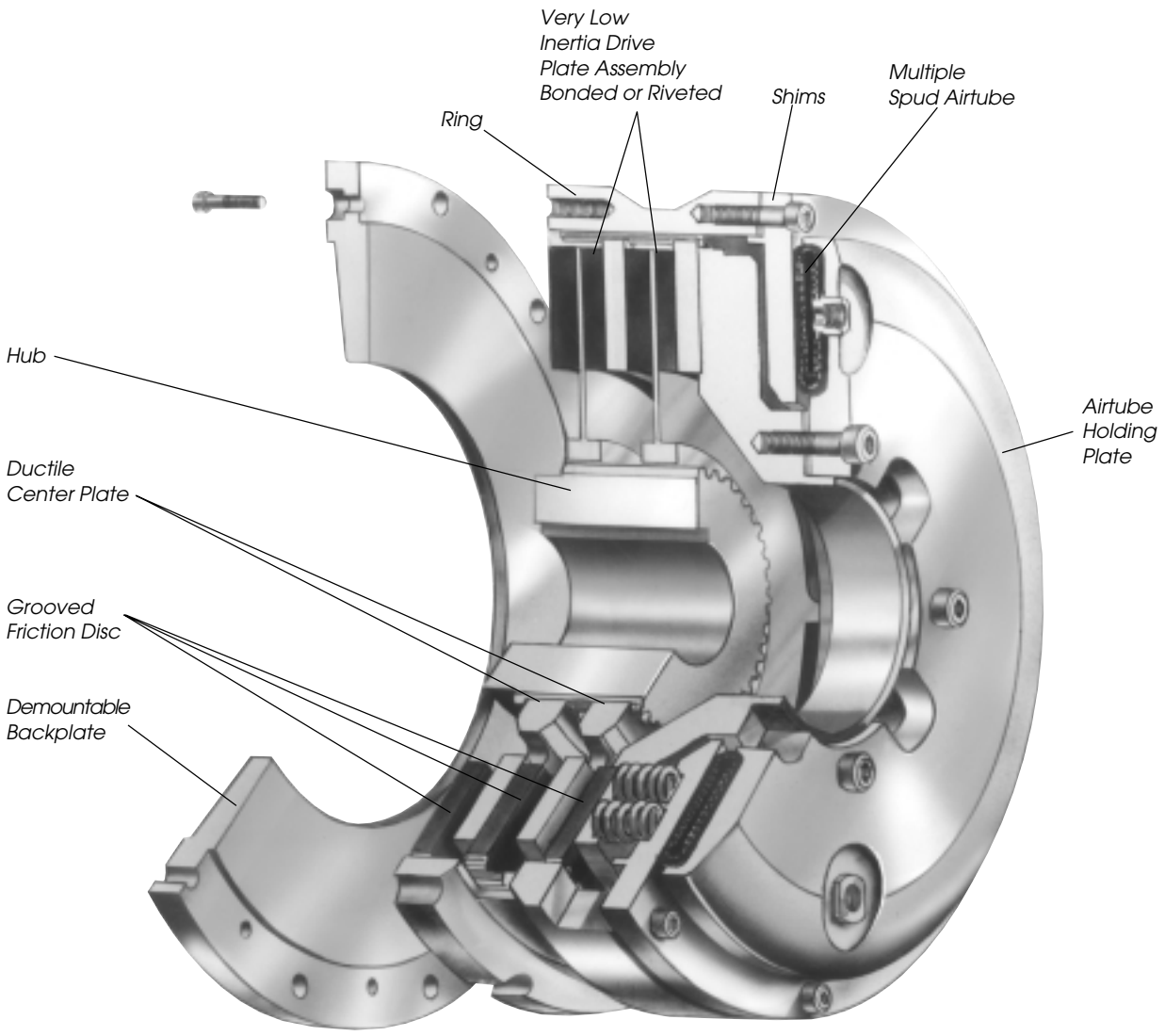
Model Size ATD-	Inflation Coefficients Operating Air Pressure 50 PSI K	50 PSI U	75 PSI K	75 PSI U	100 PSI K	100 PSI U
111	393000	3	151000	3	5100	4
211	393000	3	151000	3	5100	4
114	49000	3	30000	3	17600	3
214	49000	3	30000	3	17600	3
118	5700	2.8	5700	2.8	7500	3
218	5700	2.8	5700	2.8	7500	3
124	10400	3	5200	2.7	2600	2.5
224	10400	3	5200	2.7	2600	2.5
130	940	2.2	1070	2.2	590	2
230	940	2.2	1070	2.2	590	2
136	77000	3.5	58000	3.5	44000	3.5
236	77000	3.5	58000	3.5	44000	3.5
148	1200	2.5	1240	3.5	800	2.5
248	1200	2.5	1240	3.5	800	2.5
260	450	2.2	520	2.4	595	2.5
360	450	2.2	520	2.4	595	2.5

Exhaust Coefficients

Model Size ATD-	Exhaust Coefficients Operating Air Pressure 50 PSI R	50 PSI E	50 PSI V	75 PSI R	75 PSI E	75 PSI V	100 PSI R	100 PSI E	100 PSI V
111	480000	.04	4	180000	.05	4	*	.056	5
211	480000	.04	4	180000	.05	4	*	.056	5
114	5600	.032	2.5	2200	.044	2.5	910	.064	2.5
214	5600	.032	2.5	2200	.044	2.5	910	.064	2.5
118	4100	.062	3	9800	.1	4	8500	.104	4
218	4100	.062	3	9800	.1	4	8500	.104	4
124	280	.06	2	775	.068	2.5	575	.078	2.5
224	280	.06	2	775	.068	2.5	575	.078	2.5
130	690	.072	2.5	500	.083	2.5	500	.084	2.5
230	690	.072	2.5	500	.083	2.5	500	.084	2.5
136	86	.048	1.5	76	.056	1.5	1100	.064	1.5
236	86	.048	1.5	76	.056	1.5	1100	.064	1.5
148	160	.11	2.3	120	.136	2.4	111	.15	2.5
248	160	.11	2.3	120	.136	2.4	111	.15	2.5
260	72	.16	2.3	59	.186	2.5	45	22	2.5
360	72	.16	2.3	59	.186	2.5	45	22	2.5

* 1.88×10^6

Spring-Set Air Release Brakes



Wichita Spring-Set Air Release Brakes are ideal for fail safe protection of process equipment. Constructed of high strength cast iron, this improved design has thick friction discs for longer wear life. The fast acting air-tube design assures quick, smooth stops.

- No lubrication
- No adjustment
- Available in vertical mount
- Quick, simple installation
- Explosion proof design

Selection requirements

The selection of a Low Inertia Brake is based on:

1. Torque required to stop a load.
2. Friction area necessary to absorb rotational energy.
3. Contact velocity of rotating discs.
4. Maximum bore capacity of unit.

Selection

Low Inertia Spring-Set Brake

To properly select a brake, the total rotating inertia, WR^2, must be reflected to the brakeshaft.

Application Data:

Refer to page 41, except, cyclic operation—7 rpm, and 218 Very Low Inertia Clutch.

Alternate Shaft WR^2 referred to clutch shaft =

$$\text{(Alternate Shaft } WR^2) \left(\frac{\text{Alternate Shaft rpm}}{\text{Clutch Brake Shaft rpm}}\right)^2$$

WR^2 referred to clutch-brake shaft

$$= (39{,}091) \left(\frac{30}{204}\right)^2$$

WR^2 referrred to clutch-brake shaft
= 845.4 lb.ft.^{2} @ 204 rpm

Crank Shaft WR^2 =	845.4 lb.ft.^{2}
Clutch-Brake Shaft WR^2 =	78.2 lb.ft.^{2}
Clutch Hub and Drive Plate WR^2 from Specification Table = (page 55)	14.7 lb.ft.^{2}
Est. Brake WR^2 =	14.7 lb.ft.^{2}
Est. Total WR^2 =	953.0 lb.ft.^{2}

Brake Selection:

Stopping angle of crank shaft

$=120° = \emptyset_b$ Use 90° for calculation

Estimated time to stop:

$$t = \left(\frac{\emptyset_b}{360°}\right)\left(\frac{60}{\text{crank shaft rpm}}\right)$$

$$= \left(\frac{90}{360}\right) = \left(\frac{60}{30}\right) = .5 \text{ sec.}$$

Deceleration Torque

$$= (12)\left(\frac{WR^2}{32.2}\right) = \left(\frac{\text{clutch-brake rpm}}{(9.5)\,(t)}\right)$$

$$= (12) = \left(\frac{953}{32.2}\right) = \left(\frac{204}{(9.5)\,(.5)}\right)$$

= 15,250 lb.in.

HP/100 rpm

$$= \frac{15{,}250}{630} = 24 \text{ HP/100 rpm}$$

From duty chart (page 29) "Group B" for spring set brake (SS):

214 SS Brake is rated @ 28 HP/100 rpm
90% torque rating = 24,800 lb.in.

WR^2 of 214 SS VLI Brake = 4.5 lb.ft.^{2}, therefore deceleration torque calculation is correct.

*Average heat horsepower to clutch & brake.

$$\text{Ave. heat HP} = \frac{(\text{Total } WR^2)\,(\text{rpm}^2)\,(\text{cpm})}{1.9 \times 10^8}$$

$$= \frac{(953)\,(41{,}616)\,(7)}{1.9 \times 10^8} = 1.45 \text{ HP}$$

*Check with factory for heat capacity.

Note:
This application example is for preliminary sizing only. Contact a Wichita Sales Engineer or the factory for final selection.

Spring-Set Air Release Brakes

(1) For high speed cyclic duty

(2) Slow speed cyclic duty

(3) Holding and service brakes

Specifications

Model Size ATD-	Slip Torque Lb. In. .3 CF* Minimum Air-Tube Pressure PSI For Released Brake 60 (1)	75(2)	100 (3)
106	2,225	2,900	3,700
206	4,300	5,600	7,200
108	3,700	4,800	6,200
208	7,100	9,100	12,000
111	8,200	10,500	11,600
211	15,600	20,000	26,000
114	14,500	18,600	24,700
214	27,600	35,400	46,300
118	31,400	40,400	51,600
218	60,000	77,000	100,000
124H	75,500	111,000	128,000
224H	137,000	216,000	242,000
130H	162,200	211,700	260,500
230H	310,000	404,500	495,500
136	254,500	300,000	400,000
236	477,500	564,000	760,000
142	425,000	—	—
242	796,000	—	—
148	698,250	—	—
248	1,335,000	—	—
260	3,255,000	—	—
360	4,921,000	—	—

* Max. recommended air pressure – 130 PSI

Model No.	
Model Size	**Model Type**
ATD-xxx	LI-SSB for Low Inertia Spring Set Brake
ATD-xxx	VLI-SSB for Very Low Inertia Spring Set Brake

Model Size ATD-	See Application Factor Chart Swept Friction Area In²	Max. Bore Rect. Key Inches	Air Volume-Inches³ New Linings	Worn Linings	Recommended Clearances Inches
106	39	2	5	12	1/16-3/32
206	78	2	6	12	1/16-3/32
108	56	2-3/8	6	18	1/16-1/8
208	112	2-3/8	7	18	3/32-5/32
111	114	2-5/8	10	30	1/16-1/8
211	228	2-5/8	12	30	3/32-5/32
114	158	4-1/8	15	45	1/16-1/8
214	316	4-1/8	18	45	3/32-5/32
118	264	5-1/4	26	80	1/16-1/8
218	528	5-1/4	30	80	3/32-5/32
124H	574	7	60	165	3/32-5/32
224H	1,148	7	70	165	1/8-3/16
130H	827	8-1/2	100	240	3/32-5/32
230H	1,654	8-1/2	125	240	1/8-3/16
136	1,150	10-1/2	150	375	3/32-5/32
236	2,300	10-1/2	170	375	1/8-3/16
142	1,400	14	180	525	1/8-3/16
242	2,800	14	200	525	5/32-7/32
148	2,010	18	380	925	1/8-3/16
248	4,020	18	450	925	5/32-7/32
260	7,230	19	625	1750	3/16-5/16
360	10,845	19	750	1750	1/4-3/8

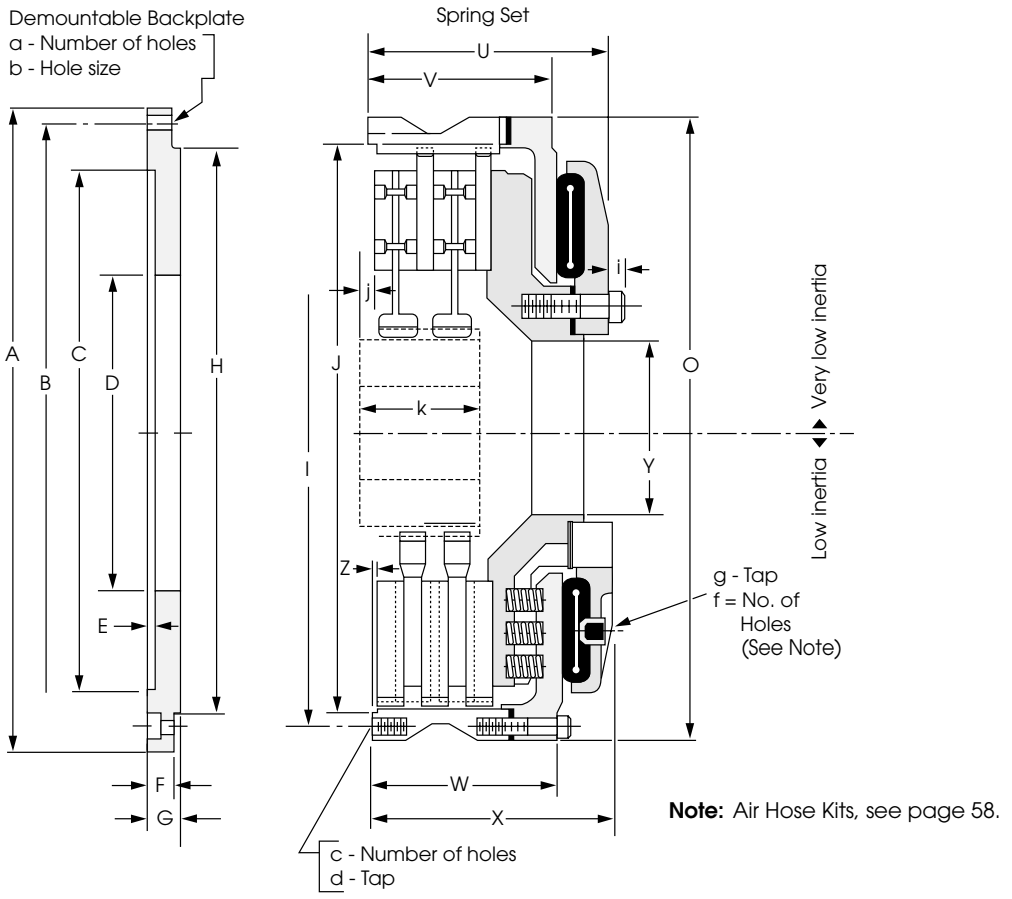
Note: Very Low Spring Set Brakes are available in sizes from ATD-108 to ATD-224H.

Model Size ATD-	*Do Not Exceed 90% Of Slip Torque Ratings — Maximum Horsepower Per 100 RPM Release Pressure - PSI 60 Duty A	B	C	D	75 Duty A	B	C	D	100 Duty A	B	C	D
106	3	2.3	1.2	.6	4	3	1.5	.8	5	3.8	2	1
206	6	4.4	2.3	1.1	8	5.7	3	1.5	10	7.4	3.9	2
108	5.3	3.8	2	1	7	5	2.6	1.3	9	6.3	3.3	1.6
208	10	7.3	3.8	2	13	9.3	5	2.5	17	12.3	6.5	3.2
111	11.7	8.4	4.4	2.2	15	10.7	5.7	2.8	16.6	12	6.3	3.1
211	22	16	8.4	4.2	28.6	20.5	11	5.4	37	26	14	7
114	20	15	8	4	26.6	19	10	5	35	25	13	6.7
214	39	28	15	7.5	50	36	19	9.5	66	47	25	12.5
118	45	32	17	8.5	58	41	22	11	74	53	28	14
218	86	61	32	16	110	79	41	21	143	102	54	27
124H	108	77	41	20	158	114	60	30	183	131	69	34
224H	196	140	74	37	308	222	117	58	346	248	131	65
130H	232	166	88	44	303	217	115	57	372	267	141	70
230H	443	318	167	84	578	415	218	110	710	508	268	134
136	363	260	137	68	660	475	250	125	—	—	—	—
236	560	400	210	105	1050	755	400	200	—	—	—	—
142	610	435	230	115	—	—	—	—	—	—	—	—
242	1140	815	430	215	—	—	—	—	—	—	—	—
148	1000	715	375	190	—	—	—	—	—	—	—	—
248	1910	1370	720	360	—	—	—	—	—	—	—	—
260	4650	2340	1760	880	—	—	—	—	—	—	—	—
360	7030	4050	2660	1330	—	—	—	—	—	—	—	—

Model Size ATD-	Low Inertia Spring Set Total Wt. Lbs.	HUB & CP Wt. Lbs.	HUB & CP WR² #Ft.²	Effec. Wt† Lbs.	Very Low Inertia Spring Set Total Wt. Lbs.	HUB & DP Wt. Lbs.	HUB & DP WR² #Ft.²	Effec. Wt.† Lbs.
106	36.5	6.40	.24	14.0	—	—	—	—
206	49.5	12.17	.46	18.34	—	—	—	—
108	63.23	10.0	.55	26.78	59.14	6.7	.24	16.53
208	81.5	16.0	.72	32.03	77.16	12.9	.44	24.06
111	96.96	15.0	1.35	40.75	97.55	9.6	.59	47.55
211	136.0	30.0	2.60	59.05	133.3	18.6	1.15	66.35
114	157.6	38	5.6	72.3	156.6	20.4	2.25	77.3
214	209.6	65	11	95.3	211.6	39.8	4.44	105.3
118	322	71	14.5	168	316.4	40.0	7.7	147
218	444	113	27.6	215	420.6	75.0	14.7	233
124H	690	131	50	377	657.5	84.0	28.5	365
224H	874	260	101	482	818	150	54.9	459
130H	1089	212	129	630	—	—	—	—
230H	1450	402	244	849	—	—	—	—
136	1814	351	325	1127	—	—	—	—
236	2780	784	705	1444	—	—	—	—
142	2994	680	705	1389	—	—	—	—
242	3601	1197	1385	1784	—	—	—	—
148	5070	1101	1785	2740	—	—	—	—
248	6501	1942	3335	3426	—	—	—	—
260	11549	2567	7077	5836	—	—	—	—
360	13739	3870	10615	6318	—	—	—	—

† Weight of internal clutch parts for use in calculating clutch engagement time.

Spring-Set Air Release Brakes



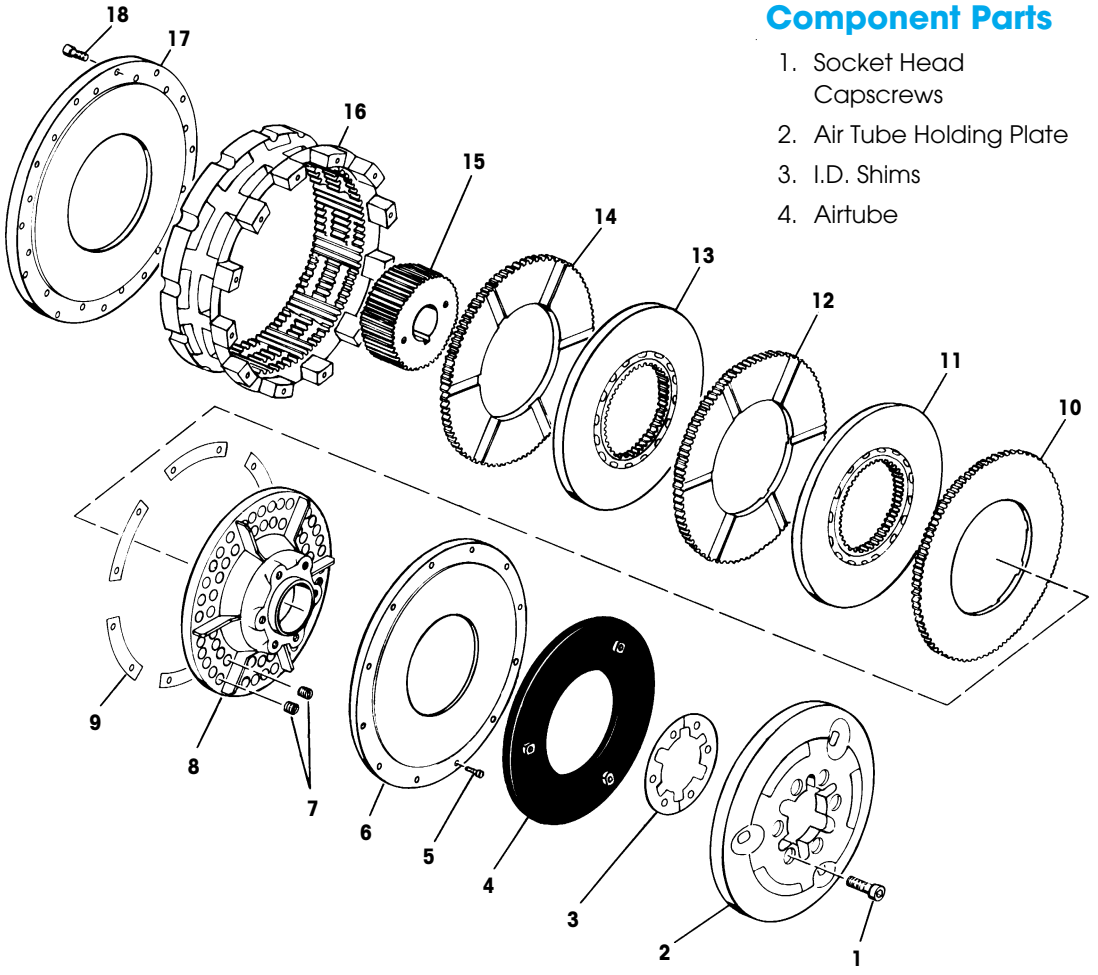
Note: Air Hose Kits, see page 58.

Dimensions

(Consult factory for drawing before final layout.)

Model No. ATD-	A	B	C	D	E	F	G	H	I	J	O	U
106	8.75	8.000	7.377/7.379	4.19	.06	.562	.69	7.373/7.375	8.000	7.377/7.379	8.81	—
206	8.75	8.000	7.377/7.379	4.19	.06	.562	.69	7.373/7.375	8.000	7.377/7.379	8.81	—
108	12.12	11.125	8.375/8.378	5.38	.25	.875	1.00	9.281/9.284	10.187	9.285/9.288	11.13	5.06
208	12.12	11.125	8.375/8.378	5.38	.25	.875	1.00	9.281/9.284	10.187	9.285/9.288	11.13	6.31
111	16.00	14.750	11.375/11.378	7.00	.38	1.125	1.25	12.370/12.373	13.500	12.375/12.378	14.75	5.00
211	16.00	14.750	11.375/11.378	7.00	.38	1.125	1.25	12.370/12.373	13.500	12.375/12.378	14.75	7.06
114	18.75	17.500	14.375/14.378	9.43	.38	1.125	1.25	15.121/15.124	16.250	15.125/15.128	17.50	6.81
214	18.75	17.500	14.375/14.378	9.43	.38	1.125	1.25	15.121/15.124	16.250	15.125/15.128	17.50	8.69
118	23.25	22.000	18.250/18.253	12.50	.38	1.125	1.25	19.495/19.498	20.750	19.500/19.503	22.00	7.44
218	23.25	22.000	18.250/18.253	12.50	.38	1.125	1.25	19.495/19.498	20.750	19.500/19.503	22.00	9.69
124H	30.00	28.750	24.375/24.378	14.50	.25	1.125	1.25	25.497/25.499	26.750	25.500/25.503	29.00	8.38
224H	30.00	28.750	24.375/24.378	14.50	.25	1.125	1.25	25.497/25.499	26.750	25.500/25.503	29.00	10.93
130H	37.00	35.500	30.375/30.378	19.25	.25	1.250	1.43	32.118/32.123	33.250	32.125/32.128	34.75	—
230H	37.00	35.500	30.375/30.378	19.25	.25	1.250	1.43	32.118/32.123	33.250	32.125/32.128	34.75	—
136	43.50	42.000	36.375/36.378	23.63	.25	1.500	1.75	38.120/38.123	39.500	38.125/38.128	41.00	
236	43.50	42.000	36.375/36.378	23.63	.25	1.500	1.75	38.120/38.123	39.500	38.125/38.128	41.00	—
142	52.00	49.250	44.625/44.628	29.50	.25	1.500	1.75	44.995/44.998	46.500	45.000/45.003	49.00	—
242	52.00	49.250	44.625/44.628	29.50	.25	1.500	1.75	44.995/44.998	46.500	45.000/45.003	49.00	—
148	61.00	58.000	52.000/52.005	32.00	.25	1.500	1.75	51.993/51.998	54.000	52.000/52.005	56.75	—
248	61.00	58.000	52.000/52.005	32.00	.25	1.500	1.75	51.993/51.998	54.000	52.000/52.005	56.75	—
260			62.750/62.760	36.00	.25			62.740/62.745	66.500	62.750/62.760	70.50	—
360			62.750/62.760	36.00	.25			62.740/62.745	66.500	62.750/62.760	70.50	—

Notes: Very Low Inertia Spring Set Brakes are available in sizes from ATD-108 to ATD-224H. See page 32.
For mounting, use socket head cap screws conforming to the ASTM-574-97a.

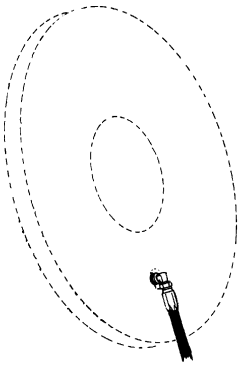


Component Parts

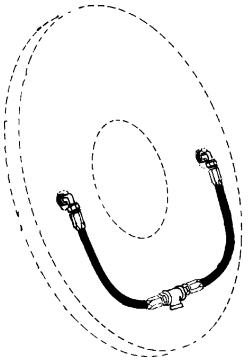
1. Socket Head Capscrews
2. Air Tube Holding Plate
3. I.D. Shims
4. Airtube
5. Socket Head Capscrews
6. Airtube Spring Plate
7. Springs
8. Spring Release Plate
9. O. D. Shims
10. Grooved Friction Disc (grooved on one side)
11. Center Plate
12. Grooved Friction Disc (grooved on both sides)
13. Center Plate
14. Grooved Friction Disc (grooved on one side)
15. Hub
16. Ring
17. Backplate
18. Socket Head Capscrews

Model No. ATD-	V	W	X	Y	Z	a	b	c	d	f	g	j	k
106	—	3.56	4.88	2.00	.06	4	11/32	4	5/16-18	2	1/4"NPT	.69	2.00
206	—	4.69	6.19	2.00	.06	4	11/32	4	5/16-18		1/4"NPT	.69	3.25
108	3.81	3.69	4.94	1.95	.13	6	17/32	6	1/2-13	2	1/2" NPT	.50	1.50
208	5.06	4.88	6.13	1.95	.13	6	17/32	6	1/2-13		1/2" NPT	.50	2.87
111	4.00	3.94	5.25	3.02	.13	6	21/32	6	5/8-11	2	1/2" NPT	.75	2.00
211	5.75	5.63	6.63	3.02	.13	6	21/32	6	5/8-11		1/2" NPT	.75	3.75
114	4.63	4.56	6.63	3.88	.13	8	21/32	8	5/8-11	2	1/2" NPT	.88	2.25
214	6.69	6.56	8.56	3.88	.13	8	21/32	8	5/8-11		1/2" NPT	.88	4.25
118	5.13	5.63	7.88	4.75	.13	12	21/32	12	5/8-11	3	1/2" NPT	.81	2.75
218	7.44	7.31	9.56	4.75	.13	12	21/32	12	5/8-11		1/2" NPT	.81	4.75
124H	6.13	5.88	8.13	8.25	.13	12	21/32	12	5/8-11	3	1/2" NPT	.56	3.13
224H	8.50	8.38	10.81	8.25	.13	12	21/32	12	5/8-11		1/2" NPT	.56	5.13
130H	—	7.13	10.00	8.25	.19	18	25/32	18	3/4-10	4	1/2" NPT	.88	5.00
230H	—	10.38	13.25	8.25	.19	18	25/32	18	3/4-10		1/2" NPT	.88	7.13
136	—	7.00	11.19	12.75	.19	18	25/32	18	3/4-10	4	1/2" NPT	.88	4.25
236	—	10.25	14.44	12.75	.19	18	25/32	18	3/4-10		1/2" NPT	.88	7.50
142	—	8.38	11.25	20.50	.25	24	1-1/32	24	1-8	4	1/2" NPT	.75	5.62
242	—	12.13	15.00	20.50	.25	24	1-1/32	24	1-8		1/2" NPT	.75	7.50
148	—	9.56	13.93	19.00	.25	24	1-1/32	24	1-8	4	1/2" NPT1	.00	6.00
248	—	13.88	18.25	19.00	.25	24	1-1/32	24	1-8		1/2" NPT1	.00	8.75
260	—	17.75	22.38	20.63	.25	24	2" NC	24	2-4-1/2	6	1/2" NPT1	.00	9.37
360	—	22.25	26.88	20.63	.25	24	2" NC	24	2-4-1/2		1/2" NPT1	.00	14.13

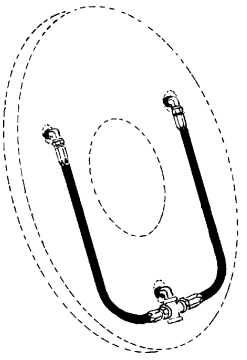
Air Hose Kits



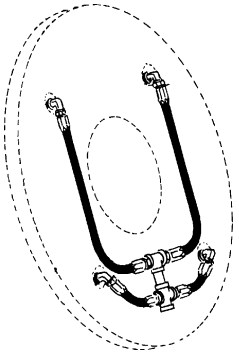
Model	Part Number
8"	8-908-912-100-5 8-908-924-100-5 QRV



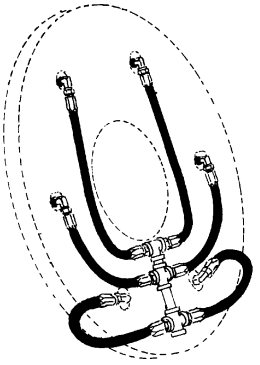
Model	Part Number
6"	8-906-912-200-4 8-906-931-201-5 QRV
8"	8-908-913-200-5 8-908-931-200-5
11"	8-911-913-200-5 8-911-931-200-5 QRV
14"	8-914-913-200-5 8-914-921-200-5 QRV
16"	8-916-913-200-5 8-916-921-200-5 QRV



Model	Part Number
18"	8-918-912-200-5 8-918-931-200-5 QRV
21"	8-921-913-200-5 8-921-931-200-5 QRV
24"	8-924-913-200-5 8-924-931-200-5 QRV
27"	8-927-913-200-5 8-927-921-200-5 QRV



Model	Part Number
30"	8-930-913-400-5 8-930-931-400-5 QRV
36"	8-936-913-400-6 8-936-931-400-6 QRV
42"	8-942-913-400-6 8-924-931-400-6 QRV
48"	8-948-912-400-6 8-948-923-400-6 QRV

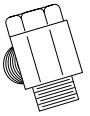


Model	Part Number
60"	8-960-912-500-5 8-960-923-400-6 QRV

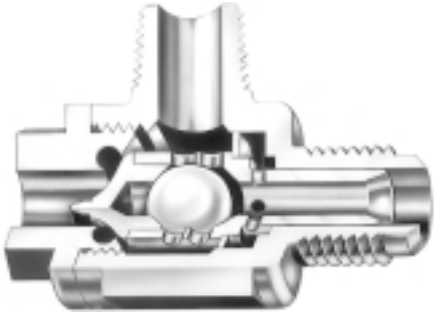
Air hose kits contain all necessary parts (fittings, hoses and extensions) to completely plumb the brake air system.

Optional Quick Release Valves can replace elbows on most units (see page 59).

Roto-couplings (see page 59).



Quick Release Valve



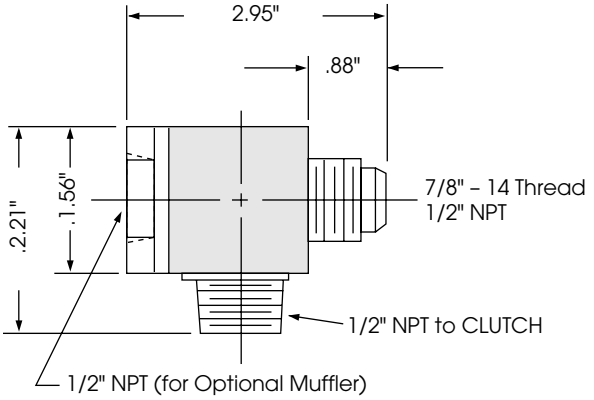
8-263-610-011-1 7/8" – 14 Thread
8-263-610-021-1 1/2" NPT

The Wichita Springless Quick Release Valve discharges twice as fast as any other valve tested in our laboratory and is four to five times faster than some common makes of valves.

This valve will close and seal with less than 20 lbs. pressure. Most others require 25 to 30 lbs. to definitely seal. In actual tests, the Wichita Valve made many hundreds of thousands of engagements and disengagements before the slightest leak occurred, or any parts needed replacement. Other valves which were tested required major replacement in fewer than 20,000 cycles.

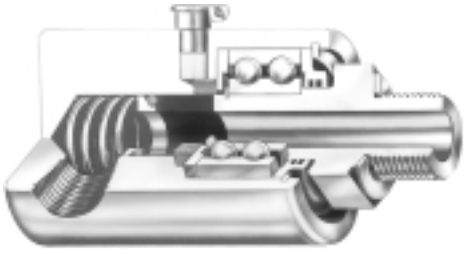
Quality Material

Body and Cap: High strength aluminum alloy
Stem: Moulded nylon
Check Valve: Nylon ball
"O" Ring: Neoprene



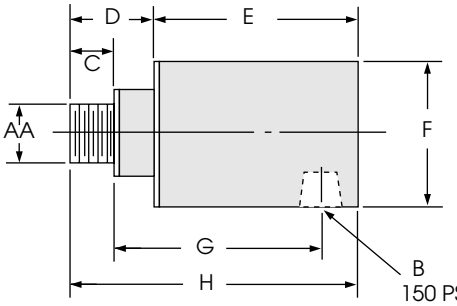
Standard thread arrangement of 1/2" size. 1/2" pipe thread on the tube connection and choice of 1/2" pipe thread, or standard 7/8-14NF thread for flared fitting thread on inlet connection. (Fits standard No. 10 high-pressure hose fitting.)

Roto-couplings



The Wichita Roto-coupling is a device to connect, or couple, a non-rotating air, gas, or fluid line to a rotating shaft.

- Long life, no maintenance.
- Felt seal eliminates bearing contamination.
- Fast, easy installation.



Wichita Part No.	AA	B	C	D	E	F	G	H	Max. R.P.M.
8-240-701-003-1	5/8-18NF	1/4" NPT	.40	1.046	2.250	1.500	2.13	3.297	3500
8-240-705-001-1	1"-14 NF	1/2" NPT	.75	1.250	3.188	2.500	3.00	4.438	3500
8-240-708-001-1	1"-14 NF	3/4" NPT	.75	1.313	4.688	2.875	3.69	5.440	3500
8-240-710-002-1	1-1/2"-12 NF	1" NPT	1.13	1.937	4.875	3.250	3.44	6.812	2500
8-240-712-001-1	2"-12 NF	1-1/2" NPT	1.13	2.813	5.250	4.250	5.38	8.062	2500
8-240-714-001-3	2" NPT	2" NPT	1.50	3.000	7.062	4.625	7.00	10.062	1000
8-240-716-000-3	2-1/2" NPT	2-1/2" NPT	1.88	3.250	9.375	7.000	7.75	12.625	750

Note: All measurements are in inches.

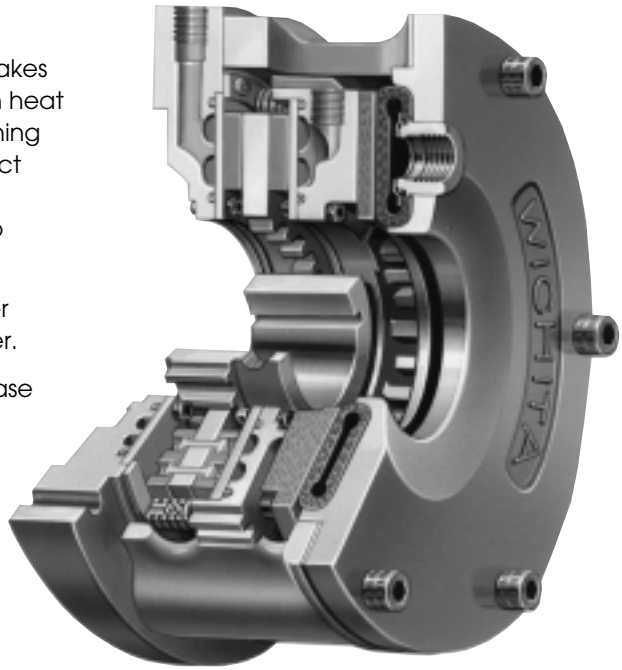
Tension Brakes/Very High Heat Capacity

Kopper Kool Brakes

Wichita Kopper Kool clutches and brakes represent the ultimate design for high heat dissipation in the most rugged tensioning applications. Torque levels are in direct proportion to air pressure, providing accurately controlled, continuous slip braking action.

- New friction material lasts longer with less wear on mating copper.
- Copper alloy wear plates increase heat transfer.
- High thermal capacity.

See pages 61 thru 69.

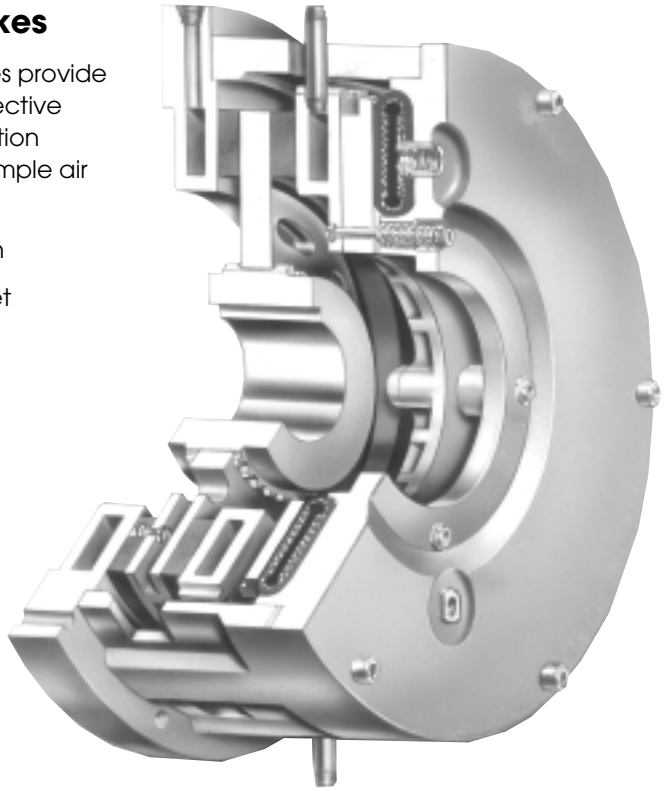


Steel Water Cooled Brakes

Wichita Steel Water Cooled Brakes provide high heat dissipation in a cost effective design. The proven airtube actuation allows precise web tension with simple air controls.

- Simple, cost effective design
- One piece steel water jacket eliminates leakage

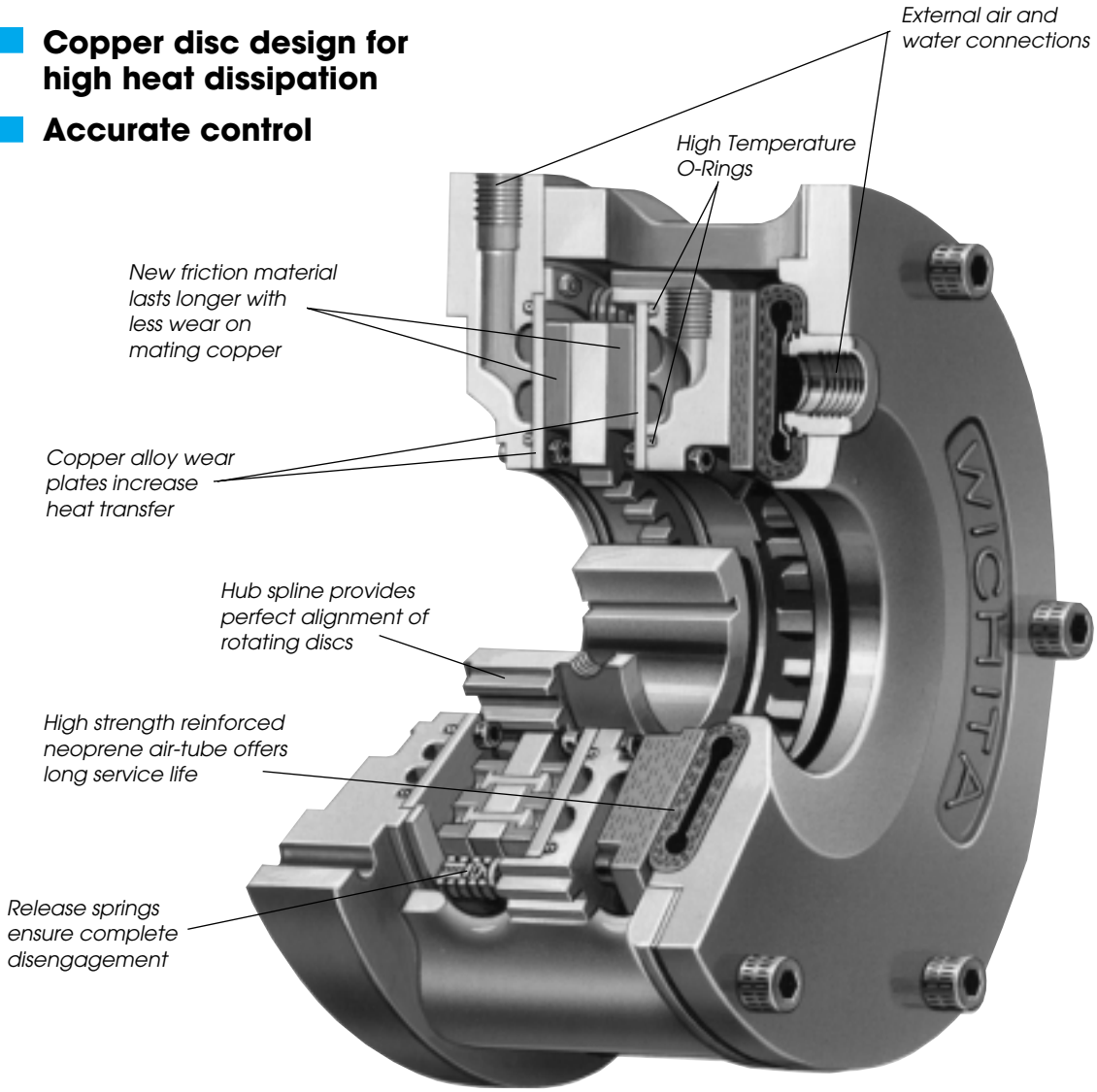
See pages 70 thru 75.



Kopper Kool Brakes

Copper disc design for high heat dissipation

Accurate control



The Wichita Kopper Kool airtube disc Clutches and Brakes are liquid cooled and consist of a series of alternating discs connecting an inner drive member to an outer drive member. Engagement is achieved by pneumatic expansion of the airtube. This air-operated clutch contains copper discs for excellent heat dissipation and provides an accurately controlled continuous slip action for constant web tensioning. Tension levels are in direct proportion to air pressure applied.

Design Features

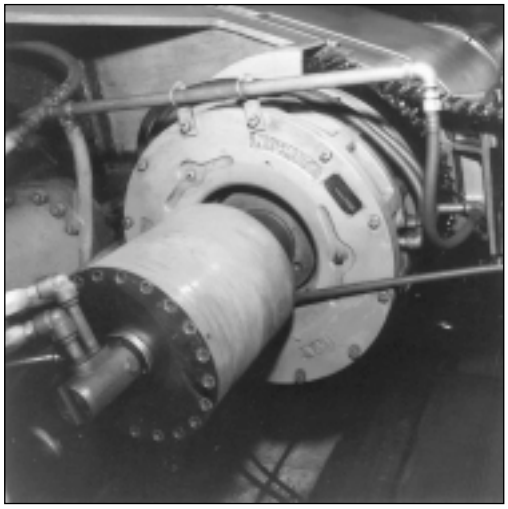
- New friction material lasts longer with less wear on mating copper.
- Copper alloy wear plates increase heat transfer.
- Hub spline provides perfect alignment of rotating discs.
- External air & water connections.
- Release springs ensure complete disengagement.
- High strength reinforced neoprene air-tube offers long service life.
- Optional long stroke air tube available on 18" or 24" size units to increase life and standard maintenance intervals.
- High thermal capacity.

Design advantages

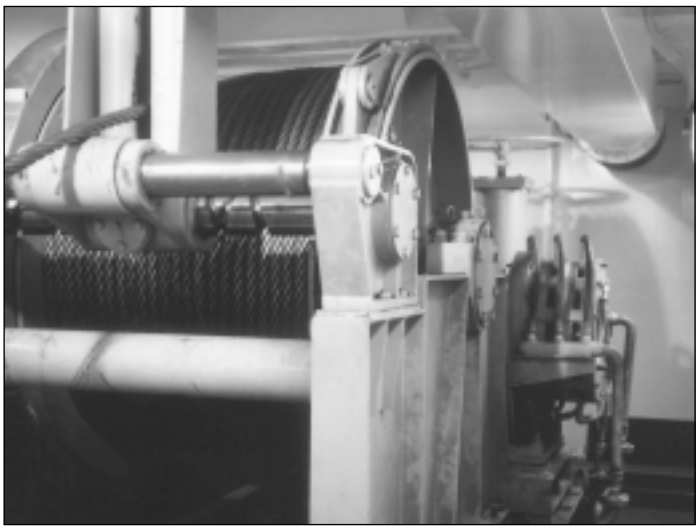
- New friction material is longer lasting with less wear on mating copper. Consistent torque response results directly with air pressure applied. Mechanically retained friction pads can be changed in field.
- Copper has a greater heat transfer capacity than any other metal other than precious metals.
- Generated teeth, in addition to providing perfect alignment of rotating members, offer maximum sensitivity of torque to pressure relationship. All factors affecting torque are fully controlled. Tangential cooling grooves insure effective mixing of cooling water for best heat conductivity. Water volume of the jackets insures high water velocity, which reduces sedimentation and chemical formation. Maximum inlet pressure is 60 psi.
- Close grain alloy iron jackets for coolant assure maximum resistance to corrosion.
- Releasing springs insure complete disengagement.
- By using a triple roto-coupling, the brake can be used as a constant slipping clutch.
- Flexible fiberglass pressure plate assures even distribution of pressure from actuator to braking surfaces, providing maximum contact area on friction surfaces.
- All coolant and air connections are external and easily accessible. Double outlets in center water jackets for multiple plate units 24" and larger.
- Air passages through brake greatly assist in keeping brake cool.
- Actuating member is a reinforced neoprene airtube which has no resistance to movement, resulting in immediate reaction with small pressure changes. Non-corrosion neoprene is unaffected by actuating medium.

Typical Applications

Wichita Kopper Kool Brakes provide precise tension control on winch drives for mobile equipment.

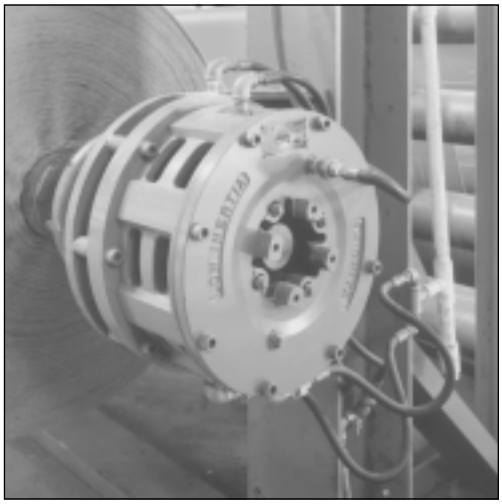


Kopper Kool Brakes dissipate high heat loads in steel uncoiler applications.



Kopper Kool brakes increase control on marine winches.

Selecting a Kopper Kool Brake for an unwind application



To properly select a tension brake for an unwind application the following information is needed:

Max. Roll Diameter	84 in.
Max. Web Width	120 in.
Max. Web Speed	1500 fpm
Max. Tension	15 pli
Air Pressure Available	100 psi
Min. Roll Diameter	12 in.
Min. Web Width	84 in.
Min. Web Speed	750 fpm
Min. Tension	10 pli
Shaft Size	5.00

Calculations

Using the calculations below, consult Kopper Kool Brake Specifications Chart, page 64.

The brake selected for this application is a 218 Kopper Kool, with 5.5 inch bore.

Max. Tension = Max. pli x Max. Web Width
= 15 x 120 = 1,800 lbs.

Max. Torque = $\frac{\text{Max. Tension x Max. Roll Dia.}}{2}$
= 1800 x 84/2 = 75,600 lb.in.

Max. RPM = $\frac{\text{Max. Web Speed x 3.82}}{\text{Min. Roll Dia.}}$
= 1,500 x 3.82/12 = 478 rpm

Heat H.P. = Max. Tension x Max. Web Speed/33,000
= $\frac{1{,}800 \times 1{,}500}{33{,}000}$ = 82 Heat HP

Min. Tension = Min. pli x Min. Web Width
= 10 x 84 = 840 lbs.

Min. Torque = $\frac{\text{Min. Tension x Min. Roll Dia.}}{2}$
= 840 x 12/2 = 5,040 lb.in.

Min. rpm = $\frac{\text{Min. Web Speed x 3.82}}{\text{Max. Roll Dia.}}$
= 750 x 3.82/84 = 34 rpm

How to select

1. Select a brake with equal to or greater thermal capacity. The ATD-214 has 150 thp @ 15 gpm. The requirement is 82 thp.
2. Check torque capacity vs. required. The ATD-214 has 42,000 lb.in. @ 100 psi. The requirement is 75,600 lb.in. Therefore an ATD-214 Brake will not produce enough torque for this application. An ATD-218 Brake would be the best choice.
3. Check Maximum Bore. The requirement is 5.00 in. The ATD-218 maximum bore is 5.5 inches.
4. Check Maximum rpm. The requirement is 478 rpm. The maximum rpm for the ATD-218 is 1,300 rpm.

Max. Air Pressure Required = $\frac{\text{Min.Torque x 100 psi}}{\text{Catalog Torque Rating}}$

= $\frac{75{,}600 \times 100}{94{,}000}$ = 80 psi

Min. Air Pressure Required = $\frac{\text{Min.Torque x 100 psi}}{\text{Catalog Torque Rating}}$

= $\frac{5{,}040 \times 100}{94{,}000}$ = 5 psi

C

Kopper Kool Brakes

Specifications

Model No. ATD-	Dynamic Slip Torque* Capacity in lb. at 100 PSI/NM at 7 Reg. Airtube	"A" Airtube	Dissipation Capacity HP/KW	Water Flow % Ethylene Glycol GPM/LPM 0	30	50	Pressure Drop Parallel Flow w/ % Eth. Glycol PSI/Bar 0	30	50
108 KKB	5,400/622.1	4,400/506.9	32/24	3.2/12	4.1/16	5.0/19	.9/.06	1.6/.11	2.3/.16
208 KKB	10,800/1,244.1	8,800/1,013.7	64/48	6.4/24	8.2/32	10/38	.9/.06	1.6/.11	2.3/.16
308 KKB	16,200/1,866.2	13,200/1,520.6	96/72	9.6/36	12.3/48	15/57	.9/.06	1.6/.11	2.3/.16
114 KKB	21,000/2,419	14,500/1,670	75/56	7.5/28	9.8/37	12/45	1.2/.08	1.6/.11	1.8/.12
214 KKB	42,000/4,838	29,000/3,341	150/112	15/56	20/74	24/90	1.2/.08	1.6/.11	1.8/.12
314 KKB	63,000/7,257	43,500/5,011	225/168	22.5/84	29/111	36/135	1.2/.08	1.6/.11	1.8/.12
118 KKB	47,000/5,414	35,000/4,032	120/90	12/45	16/60	19/72	1.7/.12	2.4/.17	2.8/.19
218 KKB	94,000/10,828	70,000/8,064	240/180	24/90	32/120	38/144	1.7/.12	2.4/.17	2.8/.19
318 KKB	141,000/16,242	105,000/12,096	360/270	36/135	48/180	57/216	1.7/.12	2.4/.17	2.8/.19
124H KKB	126,000/14,500	100,000/11,519	285/214	29/106	38/144	45/170	1.9/.13	2.4/.17	3.1/.21
224H KKB	252,000/29,000	200,000/23,039	570/428	58/212	76/288	90/340	1.9/.13	2.4/.17	3.1/.21
324H KKB	378,000/43,500	300,000/34,558	855/642	87/318	114/432	135/510	1.9/.13	2.4/.17	3.1/.21
130 KKB	200,000/23,039	150,000/17,279	345/259	35/132	45/170	54/204	2.1/.14	2.4/.17	3.1/.21
230 KKB	400,000/46,078	300,000/34,558	690/518	70/264	90/340	108/408	2.1/.14	2.4/.17	3.1/.21
330 KKB	600,000/69,117	450,000/51,837	1035/777	105/396	135/510	162/612	2.1/.14	2.4/.17	3.1/.21
136H KKB	450,000/51,827	387,000/44,580	750/562	75/284	98/369	120/454	4.0/.28	5.3/.37	7.2/.50
236H KKB	900,000/103,674	774,000/89,160	1500/1126	150/568	196/738	240/908	4.0/.28	5.3/.37	7.2/.50
336H KKB	1,350,000/149,752	1,150,000/132,473	2250/1689	225/852	294/1107	360/1362	4.0/.28	5.3/.37	7.2/.50

* Static torque will vary with temperature.
** Maximum water jacket inlet pressure 60 psi. Minimum recommended air pressure - 3 psi. Brakes with as great as 50% higher torque available on request.

PSI Pressure Curves

The cooling water requirements are listed in the specification table. The pressure drop across the brakes is given for both parallel and series flow. This table also indicates the increased flow requirement when using a mixture of ethylene glycol as an anti-freeze or for corrosion protection.

The normal water requirement for Kopper Kool brakes and clutches is one gallon of water for each 10 horsepower or one liter of water for each 2 kilowatts being dissipated. This amount of flow will give a temperature rise through the brake of 50°F (28° C). The outlet water temperature should not exceed 170°F (77°C).

The curves shown in Figure 1 and 3 indicate the pressure through the listed units for both parallel and series flow. Also shown in Figure 2 is the flow through the optional triple passage rotocouplings for Kopper Kool clutches. The data in Figures 1, 2 and 3 will aid in estimating pressure drops for different flow requirements.

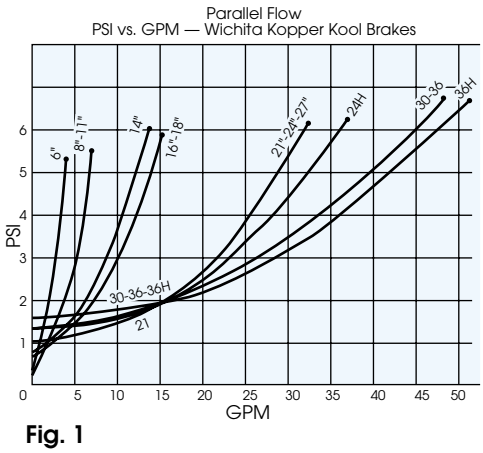


Fig. 1

An example of the use of these flow tables is: An ATD-224H clutch is selected for 200 horsepower @ 190 RPM.

The torque requirement is 66,316 lb. in.

Water flow required = 20 GPM (4 inlets - 4 outlets @5 GPM ea.)

From Figure 1 for 20 GPM (24H Curve at 5 GPM) psi drop is 1.2.

Model No. ATD-	Pressure Drop Series Flow w/ % Eth. Glycol PSI/Bar 0	30	50	Max RPM	Total Weight LB/KG	Hub & Disc Weight LB/KG	Hub & Disc WR²/KGM² lb ft²/mr²	Maximum Lining Wear size	in./cm.	cu.in./cu.dm.	Air Volume-Inches³ in³/dm³ New Linings	Worn LInings	Water Volume In.³/dm³
108 KKB	4/.14	9/.62	9/.62	2860	68/30.8	11/4.9	0.6/.03	108	0.4/1.0	10/0.2	6/.10	18/.3	8/.13
208 KKB	11/.76	25/1.72	32/2.21	2860	116/52.6	24.5/11.1	1.3/.05	208	0.4/1.0	10/0.2	7/.11	18/.3	16/.26
308 KKB	15/1.03	34/2.34	41/2.83	2860	164/74.4	38/17.2	2.0/.08	308	0.4/1.0	10/0.2	8/.13	18/.3	24/.4
114 KKB	4/.14	8/.55	12/.83	1600	221/100.2	40/18.1	5.0/2.1	114	0.5/1.3	60/1.0	15/.25	45/.7	20/.33
214 KKB	24/1.66	40/2.76	52/3.59	1600	345/156.5	80/36.3	10.5/.44	214	0.5/1.3	60/1.0	18/.30	45/.7	40/.65
314 KKB	28/1.93	48/3.31	—	1600	470/213.2	120/54.4	16/.67	314	0.5/1.3	60/1.0	23/.38	45/.7	60/1
118 KKB	7/.48	13/.9	20/1.38	1300	415/188.2	88/39.9	18/.76	118	0.6/1.5	75/1.2	26/.43	80/1.3	48/.8
218 KKB	52/3.59	—	—	1300	565/256.3	176/79.8	36/1.52	218	0.6/1.5	75/1.2	30/.49	80/1.3	96/1.5
318 KKB	—	—	—	1300	715/324.2	264/119.8	54/2.28	318	0.6/1.5	75/1.2	35/.57	80/1.3	144/2.35
124H KKB	7/.48	11/.76	14/.97	960	935/424.1	240/109.9	110/4.64	124H	0.8/2.0	200/3.3	60/1.0	165/2.7	110/1.8
224H KKB	23/1.59	35/2.41	48/3.31	960	1500/680.4	410/185	210/8.85	224H	0.8/2.0	200/3.3	70/1.1	165/2.7	220/3.6
324H KKB	30/2.07	46/3.17	—	960	2065/936.7	580/263.1	310/13.06	324H	0.8/2.0	200/3.3	80/1.3	165/2.7	330/5.4
130 KKB	9/.62	14/.97	21/1.45	760	1134/514.4	263/119.3	139/5.86	130	0.8/2.0	240/3.9	80/1.3	220/3.6	190/3.1
230 KKB	31/2.14	48/3.31	—	760	1850/839.2	530/240.4	275/11.59	230	0.8/2.0	240/3.9	90/1.5	220/3.6	380/6.2
330 KKB	40/2.76	—	—	760	2565/1163	795/360.6	410/17.28	330	0.8/2.0	240/3.9	110/1.8	220/3.6	570/9.3
136H KKB	14/.97	24/1.66	—	640	2550/1157	535/242.7	410/17.28	136H	0.8/2.0	500/8.2	175/2.9	450/7.4	285/4.7
236H KKB	60/4.14	—	—	640	4111/1865	925/419.6	790/33.29	236H	0.8/2.0	500/8.2	195/3.2	450/7.4	570/9.3
336H KKB	—	—	—	640	5595/2538	1685/764	1621/68.3	336H	0.8/2.0	500/8.2	235/3.9	450/7.4	855/14

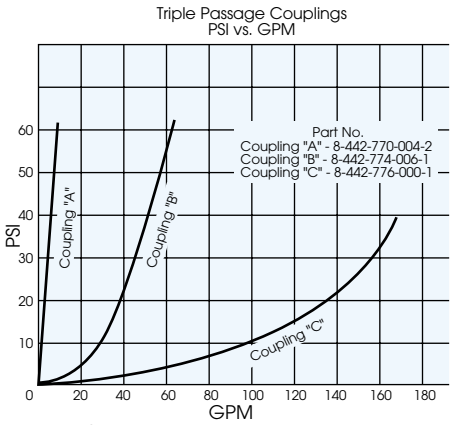


Fig. 2

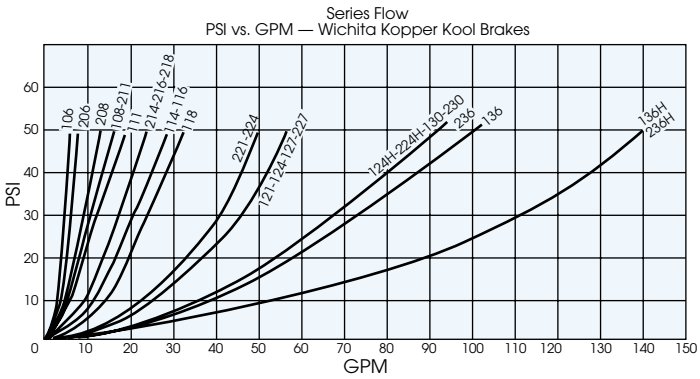
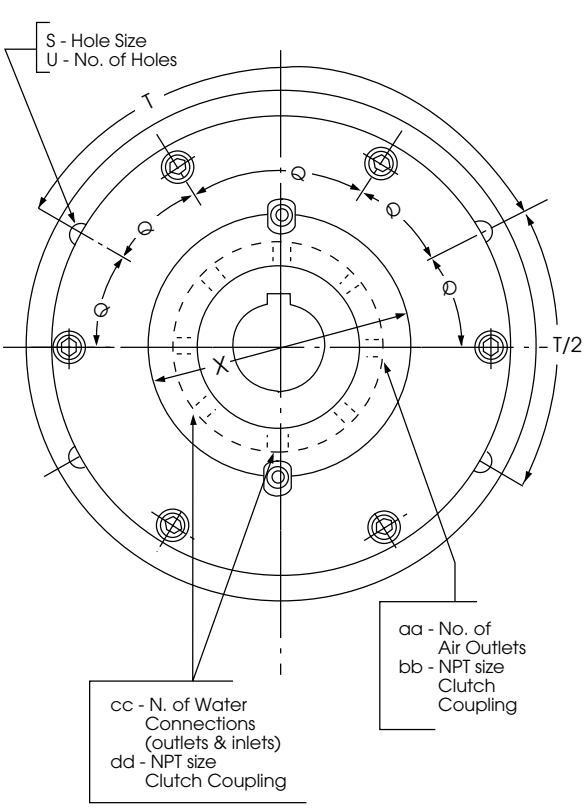


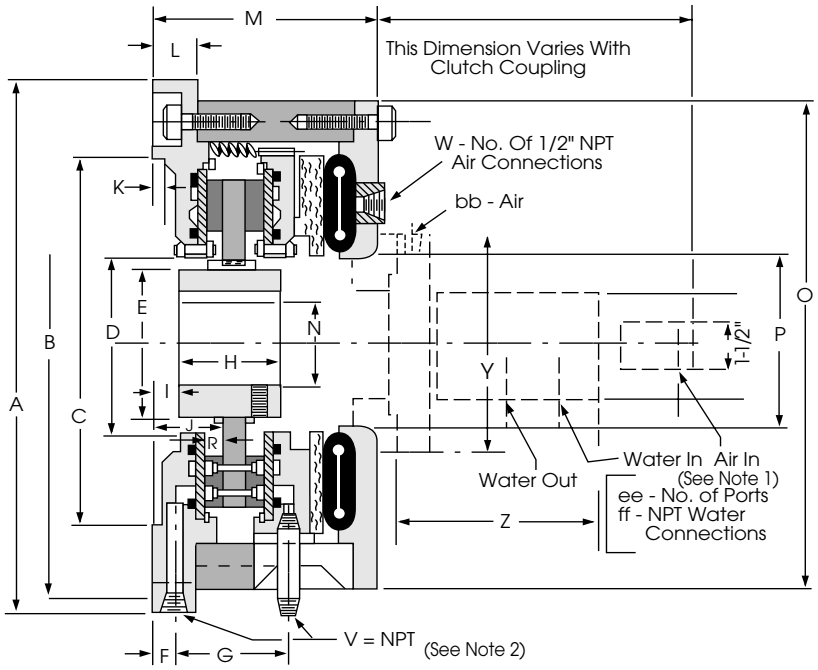
Fig. 3

From Figure 2 for 20 GPM psi drop is 5 The pressure drop would be 6.2 psi across the inlet and outlet of coupling "B" for this application.

Horsepower ratings as shown are for continuous slip. The ratings can be increased for intermittent service. Please consult the factory for such applications.

Kopper Kool Brakes





Notes:

1. Roto-couplings, see page 79.
2. Water Hose Kits, see page 76.
3. Triple passage roto-couplings, see page 78.

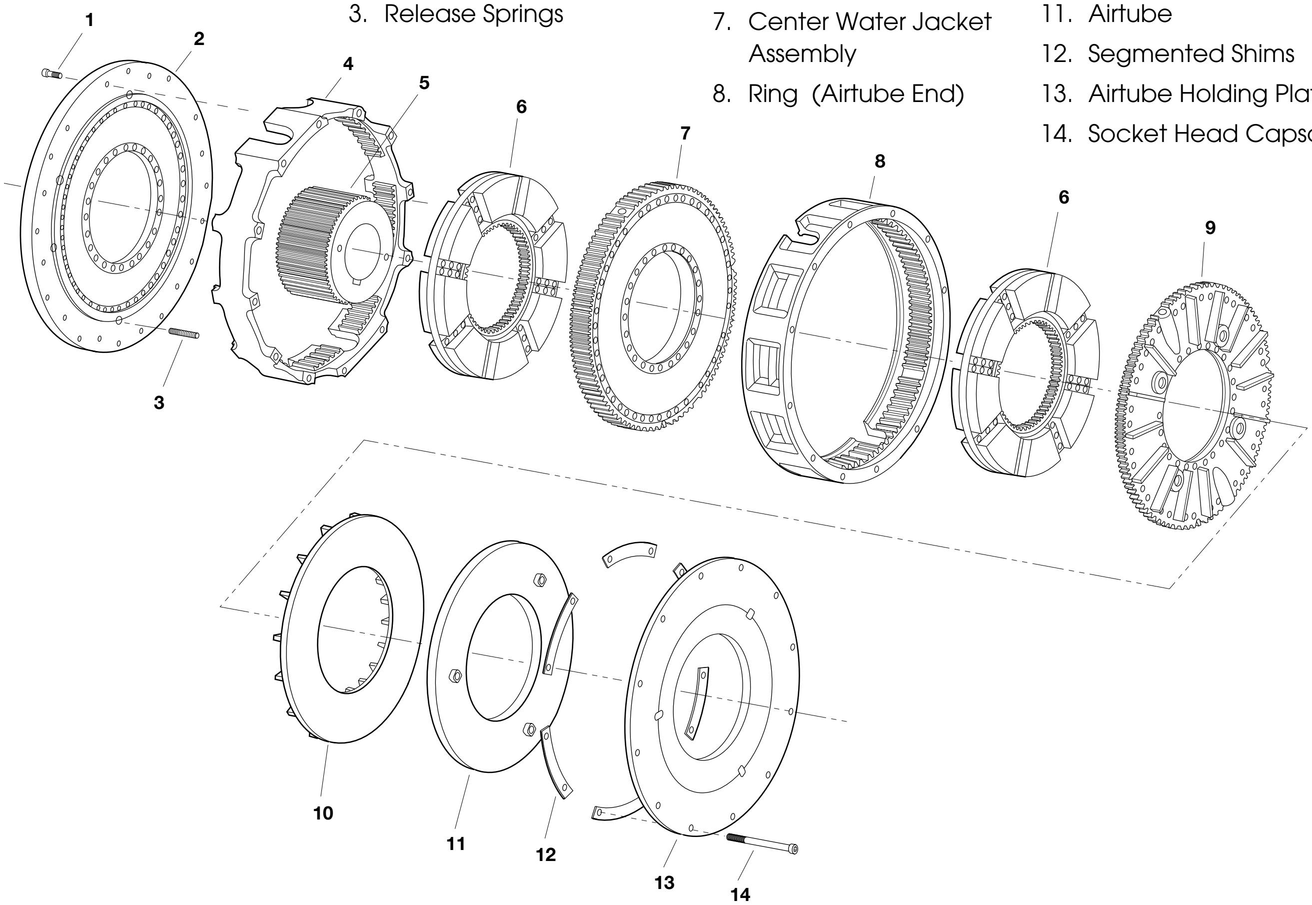
Dimensions (in) (Consult factory for drawing before final layout.)

Model No. ATD-	A	B	C -.000" +.003	D	E	F	G	H	I	J	K	L	M	Max. Bore Rect. Key N	O
108 KKB	12.125	11-1/8	8.378	4-3/8	3-1/2	11/16	2-7/8	2.00	1-1/8	1-13/16	1/4	1-3/8	5-11/16	2-1/4	11-3/4
208 KKB	12.125	11-1/8	8.378	4-3/8	3-1/2	11/16	2-3/4	4.25	1-1/8	1-13/16	1/4	1-3/8	8-1/2	2-1/4	11-3/4
308 KKB	12.125	11-1/8	8.378	4-3/8	3-1/2	11/16	2	7.00	1-1/8	1-13/16	1/4	1-3/8	11-1/4	2-1/4	11-3/4
114 KKB	18.750	17-1/2	14.375	7-3/8	6-1/2	3/4	3-7/16	3.25	1-1/16	2-3/32	1/4	1-1/2	7	4-3/8	17-1/2
214 KKB	18.750	17-1/2	14.375	7-3/8	6-1/2	3/4	3-7/16	5.88	1-11/16	2-3/32	1/4	1-1/2	10-5/8	4-3/8	17-1/2
314 KKB	18.750	17-1/2	14.375	7-3/8	6-1/2	3/4	3-7/16	9.13	1-11/16	2-3/32	1/4	1-1/2	14-5/16	4-3/8	17-1/2
118 KKB	23.250	22	18.253	9-3/8	8-1/4	3/4	4-3/16	3.63	1-1/16	2-9/32	1/4	1-1/2	8-1/8	5-1/2	22
218 KKB	23.250	22	18.253	9-3/8	8-1/4	3/4	4-1/8	7.13	1-5/8	2-9/32	1/4	1-1/2	12-3/8	5-1/2	22
318 KKB	23.250	22	18.253	9-3/8	8/14	3/4	4-1/8	10.75	1-5/8	2-9/32	1/4	1-1/2	16-5/8	5-1/2	22
124H KKB	30.000	28-3/4	24.375	12-11/16	11-1/2	1-3/16	4-7/8	5.00	1-3/8	2-7/8	1/4	2-3/8	10	7-5/8	31
224H KKB	30.000	28-3/4	24.375	12-11/16	11-1/2	1-3/16	4-7/8	8.63	1-3/8	2-7/8	1/4	2-3/8	14-7/8	7-5/8	31
324H KKB	30.000	28-3/4	24.375	12-11/16	11-1/2	1-3/16	4-7/8	13.63	1-3/8	2-7/8	1/4	2-3/8	19-3/4	7-5/8	31
130 KKB	37.000	35-1/2	30.378	15-3/4	14-1/4	1-1/16	4-11/16	4.63	1-3/8	2-23/32	1/4	2	9-9/16	9	34-3/4
230 KKB	37.000	35-1/2	30.378	15-3/4	14-1/4	1-1/16	4-3/4	9.25	1-3/8	2-23/32	1/4	2	14-3/8	9	34-3/4
330 KKB	37.000	35-1/2	30.378	15-3/4	14-1/4	1-1/16	4-3/4	13.88	1-3/8	2-23/32	1/4	2	19-1/4	9	34-3/4
136H KKB	43.500	42	36.378	16-1/2	14	1-1/4	6-9/16	5.63	1-1/8	3-9/16	1/4	2-7/8	13-1/4	9	44-1/2
236H KKB	43.500	42	36.378	16-1/2	14	1-1/4	6-9/16	11.00	1-7/16	3-9/16	1/4	2-7/8	19-3/4	9	44-1/2
336H KKB	43.500	42	36.378	16-1/2	14	1-1/4	6-9/16	16.63	1-7/16	3-9/16	1/4	2-7/8	26-1/4	9	44-1/2

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

Component Parts

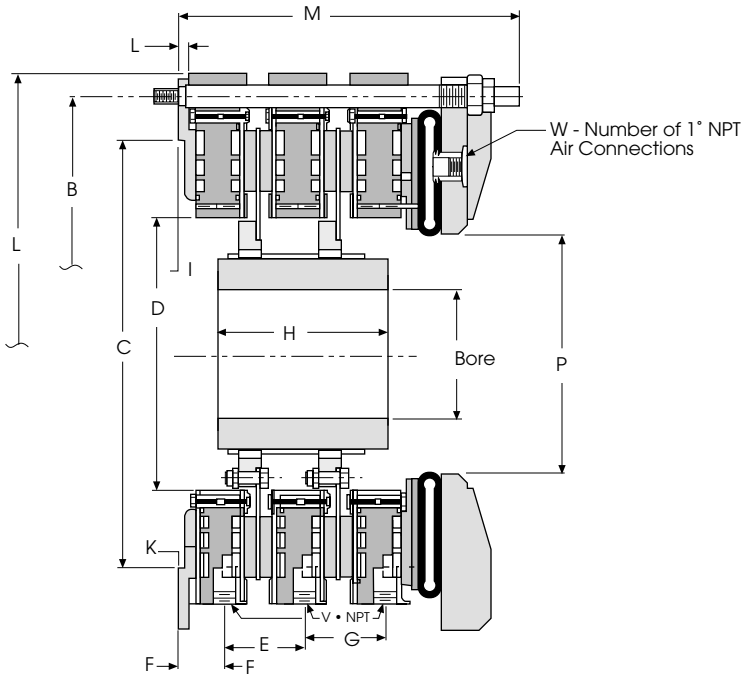
1. Socket Head Capscrews
2. Backplate Water Jacket Assembly
3. Release Springs
4. Ring (Backplate End)
5. Hub
6. Drive Plate Assembly
7. Center Water Jacket Assembly
8. Ring (Airtube End)
9. Floating Water Jacket Assembly
10. Pressure Plate
11. Airtube
12. Segmented Shims
13. Airtube Holding Plate
14. Socket Head Capscrews

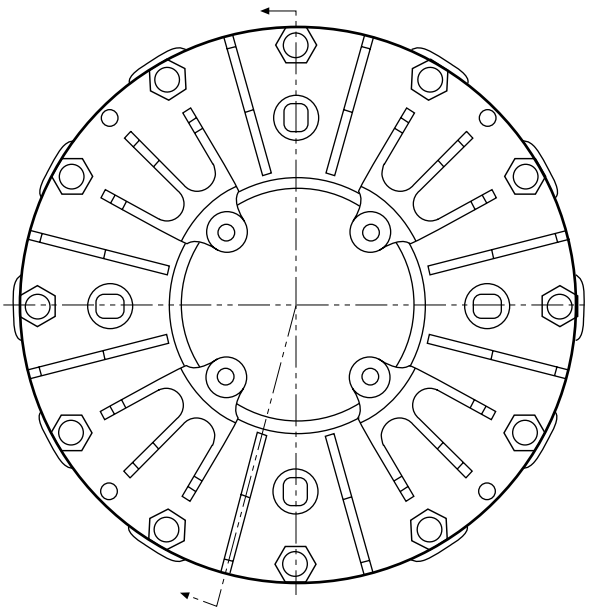


P	Q	R	S	T	U	V	W	X	Y	Z	aa	bb	cc	dd	ee	ff
3-3/4	30	7/16	17/32	120	4	3/8	2	6-5/8	6-1/2	7-1/8	1	3/8	2	3/8	2	3/8
3-3/4	30	7/16	17/32	120	4	3/8	2	6-5/8	6-1/2	7-1/8	1	3/8	2	3/8	2	3/8
3-3/4	30	7/16	17/32	120	4	3/8	2	6-5/8	6-1/2	7-1/8	1	3/8	2	3/8	2	3/8
6-7/8	22-1/2	5/8	21/32	90	6	1/2	2	10-3/4	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
6-7/8	22-1/2	5/8	21/32	90	6	1/2	2	10-3/4	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
6-7/8	22-1/2	5/8	21/32	90	6	1/2	2	10-3/4	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
9-3/4	15	7/8	21/32	60	10	1/2	3	14-3/16	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
9-3/4	15	7/8	21/32	60	10	1/2	3	14-3/16	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
9-3/4	15	7/8	21/32	60	10	1/2	3	14-3/16	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
15-1/8	15	1	21/32	60	10	1	3	21	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
15-1/8	15	1	21/32	60	10	1	3	21	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
15-1/8	15	1	21/32	60	10	1	3	21	7-1/4	10-7/8	2	3/8	6	3/4	2	1-1/4
17-3/8	10	7/8	25/32	40	16	1	4	24-3/4	10	15-7/8	2	1/2	8	1	2	2
17-3/8	10	7/8	25/32	40	16	1	4	24-3/4	10	15-7/8	2	1/2	8	1	2	2
17-3/8	10	7/8	25/32	40	16	1	4	24-3/4	10	15-7/8	2	1/2	8	1	2	2
17-3/4	10	1-3/16	25/32	40	16	1-1/4	4	30-1/2	10	15-7/8	2	1/2	8	1	2	2
17-3/4	10	1-3/16	25/32	40	16	1-1/4	4	30-1/2	10	15-7/8	2	1/2	8	1	2	2
17-3/4	10	1-3/16	25/32	40	16	1-1/4	4	30-1/2	10	15-7/8	2	1/2	8	1	2	2

Note: Other sizes are available on request.

Kopper Kool Pin Brakes





Specifications

Model No. ATD-	Dynamic Slip Torque Capacity in-lb @ 100psi	Dissipation Capacity Hp	Maximum Bore Rectangular KW
119 KKPB	65,000	160	5.50
219 KKPB	130,000	320	5.50
319 KKPB	195,000	480	5.50

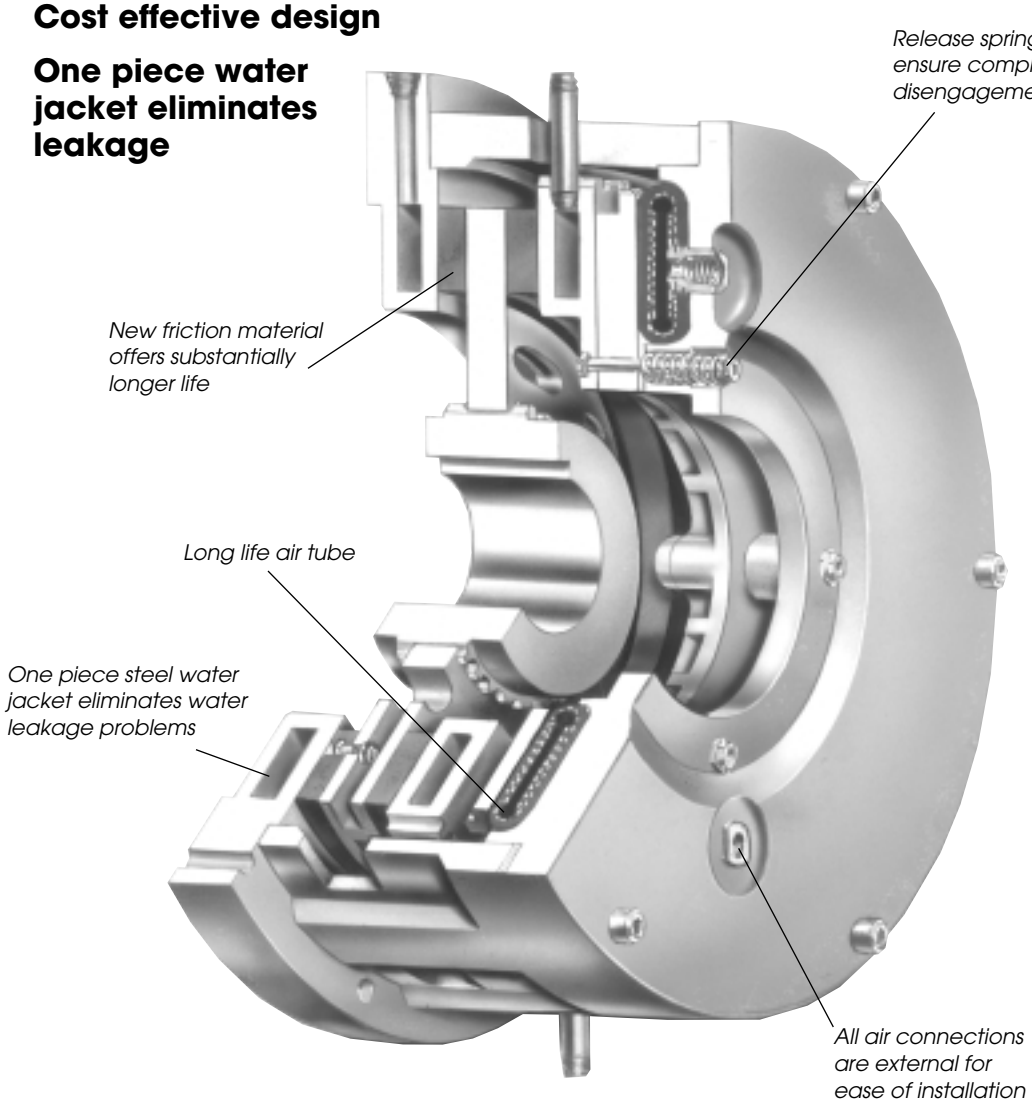
Kopper Kool Pin Clutch, KKPC available upon request.

Dimensions (in) (Consult factory for drawing before final layout.)

Model No. ATD-	A	B Hole Circle	C (+.003/ -.000)	D	F	G	H	I	K	L	M	P
119 KKPB	24.00	22.000	18.250	11.75	1.81	3.38	3.63	1.63	0.25	0.42	10.63	9.88
219 KKPB	24.00	22.000	18.250	11.75	1.81	3.38	7.13	1.63	0.25	0.42	14.00	9.88
319 KKPB	24.00	22.000	18.250	11.75	1.81	3.38	10.75	1.63	0.25	0.42	17.38	9.88

Steel Water Cooled Brakes

- **Cost effective design**
- **One piece water jacket eliminates leakage**



Design Features

Wichita Water Cooled Brakes provide high heat dissipation in a cost effective design. The proven airtube actuation allows precise web tension with simple air controls.

- Simple, cost effective design
- One piece steel water jacket eliminates leakage

Tension brakes are selected by calculating the thermal energy (heat) generated during unwind and choosing a brake with an equal to or greater heat dissipation rating. The brake selection becomes based on:

1. Maximum speed of roll.
2. Maximum torque needed to produce desired tension.
3. Heat capacity of brake.
4. Maximum bore capacity of brake.

Selecting a Steel Water Cooled Brake for an unwind application

To properly select a tension brake for an unwind application the following information is needed.

Max. Roll Diameter	60 in.
Max. Web Width	42 in.
Max. Web Speed	1000 fpm
Max. Tension	9 pli
Air Pressure Available	75 psi
Min. Roll Diameter	10 in.
Min. Web Width	36 in.
Min. Web Speed	900 fpm
Min. Tension	4.5 pli
Shaft Size	3.00

Calculations

Using the calculations below, consult the Steel Water Cooled Brake Specifications Chart, page 72.

The brake selected for this application is an ATD-114, with 3.5 inch bore.

Max. Tension = Max. pli x Max. Web Width
= 9 x 42 = 378 lbs.

Max. Torque = $\frac{\text{Max. Tension x Max. Roll Dia.}}{2}$
= 378 x 60/2 = 11,340 lb.in.

Max. RPM = $\frac{\text{Max. Web Speed x 3.82}}{\text{Min. Roll Dia.}}$
= 1,000 x 3.82/10 = 382 rpm

Heat H.P. = Max. Tension x Max. Web Speed/33,000
= $\frac{378 \times 1000}{33{,}000}$ = 11.5 Heat H.P.

Min. Tension = Min. pli x Min. Web Width
= 4.5 x 36 = 162 lbs.

Min. Torque = $\frac{\text{Min. Tension x Min. Roll Dia.}}{2}$
= 162 x 10/2 = 810 lb.in.

Min. rpm = $\frac{\text{Min. Web Speed x 3.82}}{\text{Max. Roll Dia.}}$
= 900 x 3.82/60 = 57 rpm

How to select

1. Select a brake with equal to or greater thermal capacity. The ATD-208 has 18.6 thp @ 2.8 gpm. The requirement is 11.5 thp.
2. Check torque capacity vs. required. Size ATD-208 has 10,200 lb.in. @ 100 psi. The requirement is 11,340 lb.in. Therefore an ATD-208 Brake will not produce enough torque for this application. However, an ATD-114 Brake would be the best choice.
3. Check maximum bore. The requirement is 3.00 in. The ATD-114 maximum bore is 3.5 inches.
4. Check maximum rpm. The requirement is 382 rpm. The maximum rpm for the ATD-114 is 700 rpm.

Max. Air Pressure Required = $\frac{\text{Max.Torque x 100 psi}}{\text{Catalog Torque Rating}}$

= 11,340 x 100/20,300 = 56 psi

Min. Air Pressure Required = $\frac{\text{Min.Torque x 100 psi}}{\text{Catalog Torque Rating}}$

= 810 x 100/20,300 = 4 psi

Steel Water Cooled Brakes

Specifications

Model No. ATD-	Dynamic Slip Torque Lb-In. 100 PSI	Dissipation Capacity HP	Recommended Clearances In.	Water Flow % Ethylene Glycol GPM 0	30	50	Pressure Drop Parallel Flow % Ethylene Glycol PSI 0	30	50
108 SWCB	5,100	9.3	1/16-1/8	1.4	1.8	2.2	0.6	0.75	0.9
208 SWCB	10,200	18.6	3/32-5/32	2.8	3.6	4.4	1.0	1.5	1.9
114 SWCB	20,300	28	1/16-1/8	4.2	5.5	6.6	1.0	1.1	1.2
214 SWCB	40,600	56	3/32-5/32	8.4	11	13.2	1.3	1.7	2.1
118 SWCB	47,000	45	1/16-1/8	6.8	9	11	1.2	1.4	1.6
218 SWCB	94,000	90	3/32-5/32	13.5	18	22	1.8	2.5	3.3
124H SWCB	113,300	95	3/32-5/32	14.2	18.5	22.2	1.9	2.5	3.4
224H SWCB	226,000	190	1/8-3/16	29	37	44.4	5.5	10	11
130 SWCB	187,000	140	3/32-5/32	21	27.5	33	1.5	1.9	2.1
230 SWCB	374,000	280	1/8-3/16	42	55	66	2.8	4.5	6.7
136 SWCB	374,000	190	3/32-5/32	29	38	45	2	2.5	3.1
236 SWCB	748,000	380	1/8-3/16	58	76	90	5	10	11

PSI Pressure Curves

The cooling water requirements are listed in the table. The pressure drop across the brakes is given for both parallel and series flow. This chart also indicates the increased flow requirement when using a mixture of ethylene glycol as an anti-freeze or for corrosion protection. The normal water requirement for steel brakes and clutches is one gallon of water for each 6.7 horsepower or one liter of water for each 1-1/3 kilowatts being dissipated. This amount of flow will give a temperature rise through the brake of 33° F. The outlet water temperature should not exceed 170° F.

The curves shown in Figure 1 and 3 indicate the pressure through the listed units for both parallel and series flow. Also shown in Figure 2 is the flow through the optional triple passage rotocouplings for clutches. The data in Figures 1, 2 and 3 will aid in estimating pressure drops for different flow requirements.

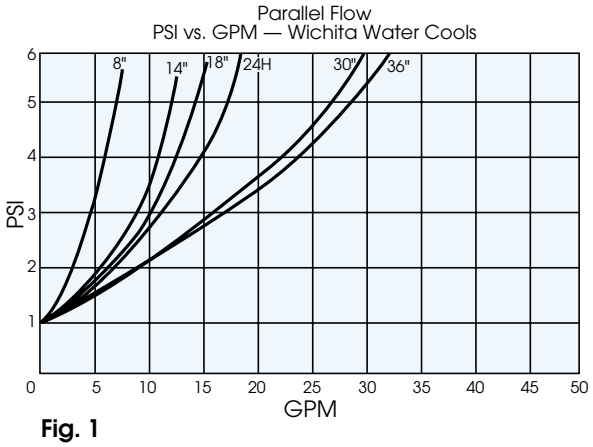


Fig. 1

An example of the use of these flow tables is:

An ATD-224H clutch is selected for 90 horsepower @ 190 RPM.

The torque requirement is 29,900 lb. in.

Water flow required = 13.5 GPM (3 inlets-3 outlets 6.7 GPM ea.)

Model No. ATD-	Pressure Drop Series Flow % Ethylene Glycol PSI 0	30	50	Maximum Slip RPM For 2500 ft./Min.	Total Wt. Lb.	Hub And Disc Wt. Lb.	Hub And Disc WR² lb. Ft²	Maximum Lining Wear In.	In.³	Air Volume In³ New Lining	Worn Lining	Water Volume In.³
108 SWCB	1	3	3.5	1200	90	11	0.7	7/32	3	6	18	34
208 SWCB	4.2	7.5	10	1200	135	18.6	1.2	7/16	6	9	18	51
114 SWCB	3	4	6	700	275	51	1.1	5/16	13	15	43	120
214 SWCB	11	15	20	700	325	43	1.8	5/8	26	23	43	180
118 SWCB	3	4	6	550	431	79	29	5/16	21	26	56	220
218 SWCB	10	19	28	550	626	91	17	5/8	42	40	56	330
124H SWCB	11	20	28	400	725	160	64	3/8	54	60	160	540
224H SWCB	44	–	–	400	1070	250	80	3/4	108	90	160	800
130 SWCB	7	12	17	325	1245	320	200	.28	117	120	315	830
230 SWCB	37	48	–	325	1900	600	395	.56	234	180	315	1250
136 SWCB	20	24	32	265	1537	463	392	.25	140	200	415	1170
236 SWCB	–	–	–	265	2685	875	825	.50	280	300	415	1750

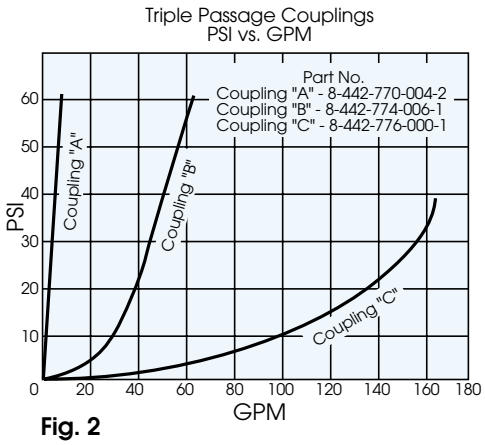


Fig. 2

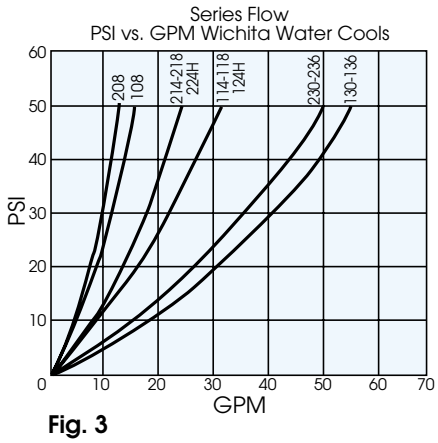
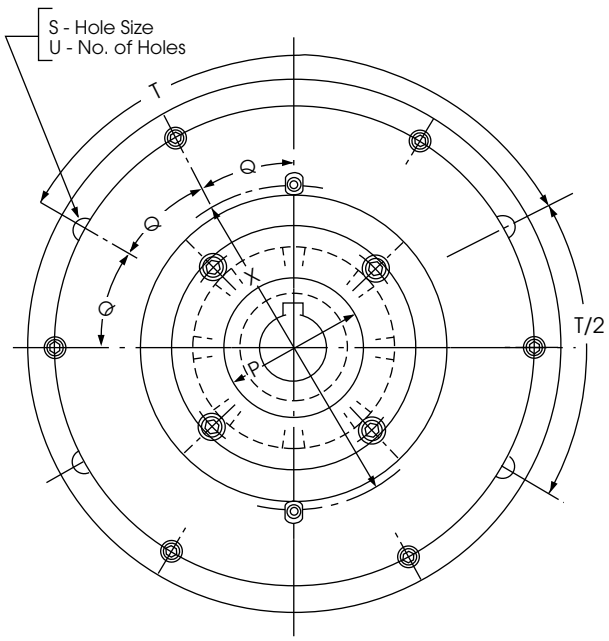
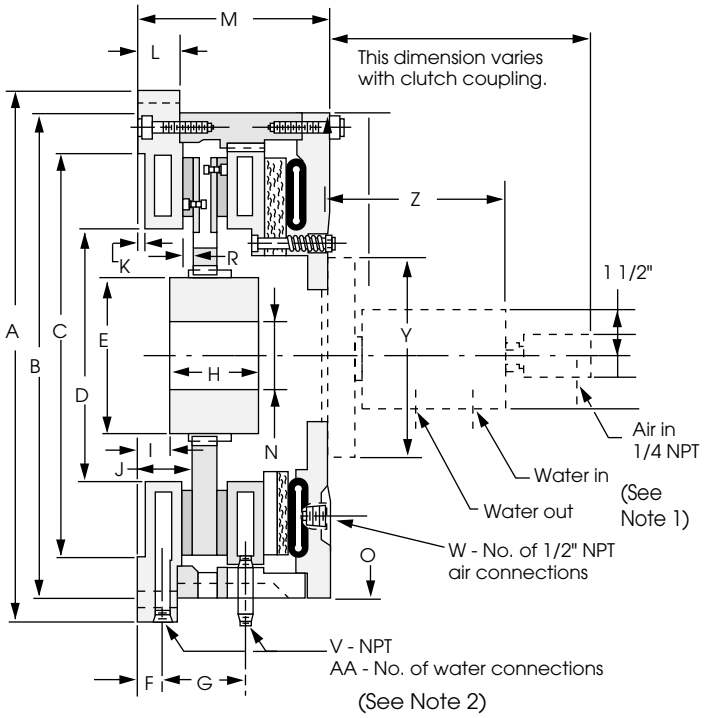


Fig. 3

From curve 1 for 6.7 GPM (24H Curve) psi the drop is 2 psi. From curve 2 for 13.5 GPM psi the drop is 2 psi. The pressure drop would be 4 psi across the inlet and outlet of coupling "B" for this appilcation.

Steel Water Cooled Brakes





Notes:

1. Roto-couplings, see page 79.
2. Water Hose Kits, see page 76.
3. Triple passage roto-couplings, see page 78.

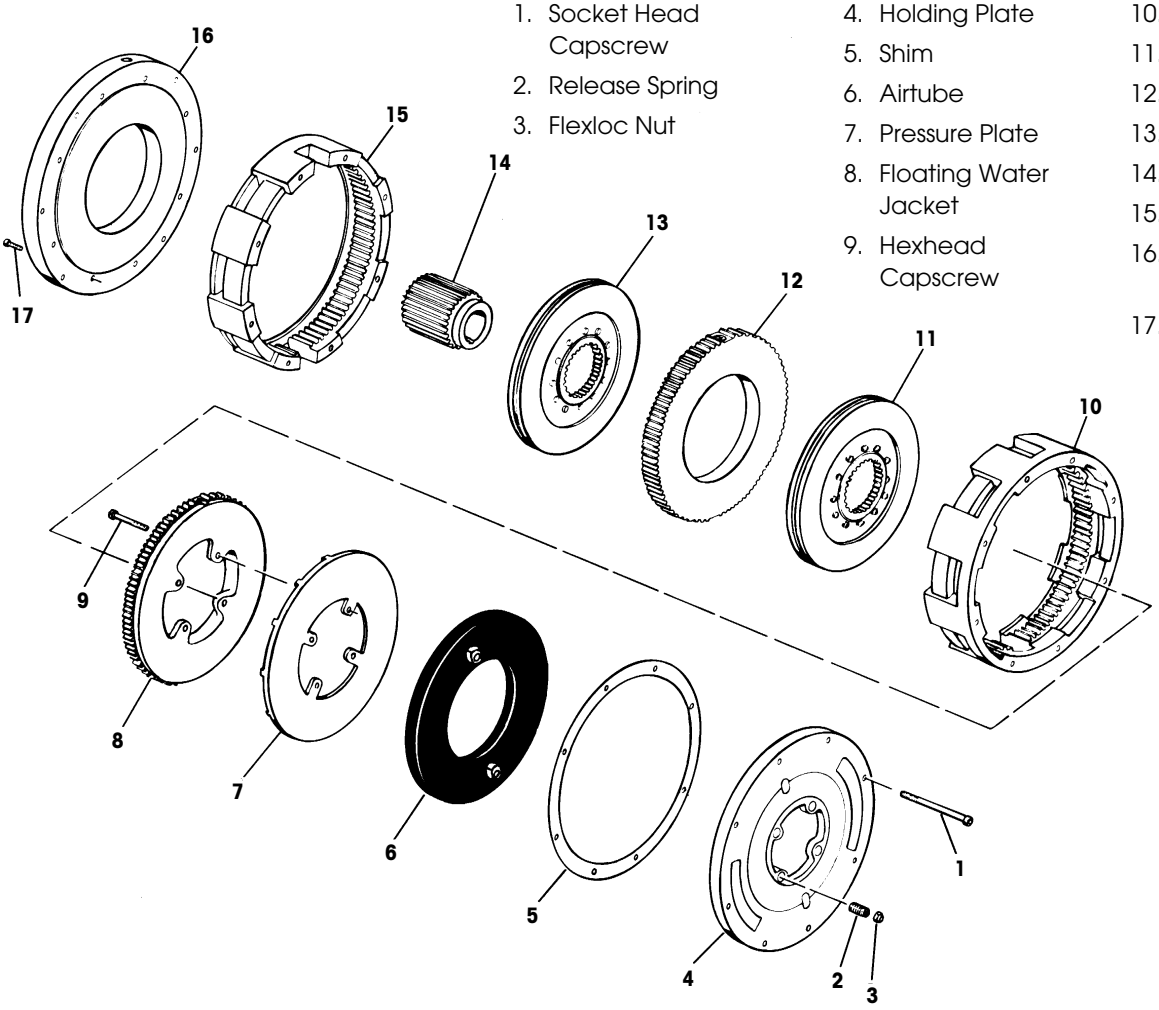
Dimensions (in) (Consult factory for drawing before final layout.)

Model No. ATD-	A	B	C +.000 -.003	D	E	F	G	H ±.015	I	J	K	L	M	Max.* Bore N
108 SWCB	12.125	11-1/8	8.378	4-5/8	3-1/2	15/16	3-1/8	2.000	1-1/8	2-1/16	1/4	1-1/2	6-3/4	2-1/4
208 SWCB	12.125	11-1/8	8.378	4-5/8	3-1/2	15/16	3-1/8	4.000	1-1/8	2-1/16	1/4	1-1/2	8-7/8	2-1/4
114 SWCB	18.750	17-1/2	14.378	8-7/16	5-1/2	1-1/16	4-1/8	3.750	1-1/16	2-1/2	1/4	1-3/4	8-1/2	3-1/2
214 SWCB	18.750	17-1/2	14.378	8-7/16	5-1/2	1-1/16	4-1/8	5.625	1-1/16	2-1/2	1/4	1-3/4	10-1/2	3-1/2
118 SWCB	23.250	22	18.253	11-7/16	7	1-1/16	4-1/8	4.000	1.69	2-1/2	1/4	1-3/4	8-7/8	4-3/4
218 SWCB	23.250	22	18.253	11-7/16	7	1-1/16	3-1/8	6.500	1-1/2	2-3/8	1/4	1-3/4	10-7/8	4-3/4
124H SWCB	30.000	28-3/4	24.378	13-1/2	9	1-1/16	4-3/4	4.000	1-3/8	2-3/4	1/4	1-3/4	10	6
224H SWCB	30.000	28-3/4	24.378	13-1/2	8	1-1/16	4-3/4	8.000	1-3/8	2-3/4	1/4	1-3/4	12-3/8	6
130 SWCB	37.000	35-1/2	30.378	18-1/4	10	1-3/16	5-1/2	5.000	1-3/8	2-15/16	1/4	2	11-1/16	7-1/4
230 SWCB	37.000	35-1/2	30.378	18-1/4	10	1-3/16	5-1/2	9.250	1-3/8	2-15/16	1/4	2	16-3/4	7-1/4
136 SWCB	43.500	42	36.378	22-1/2	12	1-5/16	5-1/2	5.625	1-1/8	2-15/16	1/4	2-1/4	11-7/8	9
236 SWCB	43.500	42	36.378	22-1/2	12	1-5/16	5-1/2	11.000	1-1/8	3-1/16	1/4	2-1/4	18	9

* Maximum bore uses rectangular key.

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

Component Parts

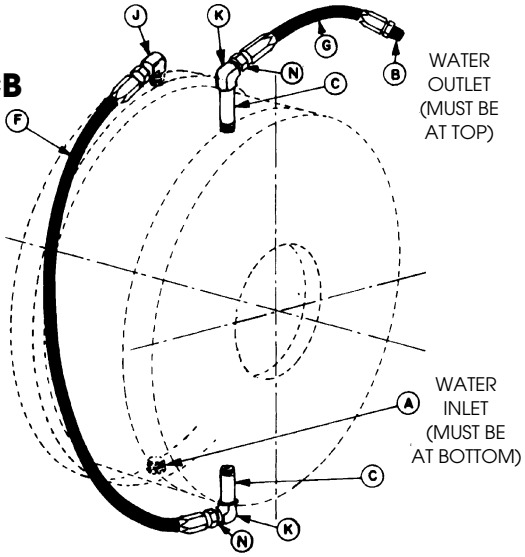


1. Socket Head Capscrew
2. Release Spring
3. Flexloc Nut
4. Holding Plate
5. Shim
6. Airtube
7. Pressure Plate
8. Floating Water Jacket
9. Hexhead Capscrew
10. Ring (Airtube End)
11. Friction Drive Plate
12. Center Water Jacket
13. Friction Drive Plate
14. Hub
15. Ring (Backplate End)
16. Backplate Water Jacket
17. Socket Head Capscrew

Model No. ATD-	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
108 SWCB	11-1/8	2-3/8	30	1/2	17/32	120	4	3/8	2	6-5/8	6-1/2	7-1/8	4
208 SWCB	11-1/8	2-3/8	30	1/2	17/32	120	4	3/8	2	6-5/8	6-1/2	7-1/8	6
114 SWCB	17-1/2	5	22-1/2	5/8	21/32	90	6	1/2	2	10-3/4	7-1/4	10-7/8	4
214 SWCB	17-1/2	5	22-1/2	5/8	21/32	90	6	1/2	2	10-3/4	7-1/4	10-7/8	6
118 SWCB	22	7-3/4	15	5/8	21/32	60	10	1/2	3	14-3/16	7-1/4	10-7/8	4
218 SWCB	22	7-3/4	15	5/8	21/32	60	10	1/2	3	14-3/16	7-1/4	10-7/8	6
124H SWCB	29	10-1/4	15	7/8	21/32	60	10	1/2	3	21	7-1/4	10-7/8	4
224H SWCB	29	10-1/4	15	7/8	21/32	60	10	1/2	3	21	7-1/4	10-7/8	6
130 SWCB	34-3/4	13-1/4	10	11/16	25/32	40	16	3/4	4	24-3/4	10	15-7/8	4
230 SWCB	34-3/4	13-1/4	10	11/16	25/32	40	16	3/4	4	24-3/4	10	15-7/8	6
136 SWCB	41	18-3/4	10	11/16	25/32	40	16	3/4	4	30-1/2	10	15-7/8	4
236 SWCB	41	18-3/4	10	11/16	25/32	40	16	3/4	4	30-1/2	10	15-7/8	6

Series Water Hose Kits for Kopper Kool Brakes, KKB and Steel Water Cooled Brakes, SWCB

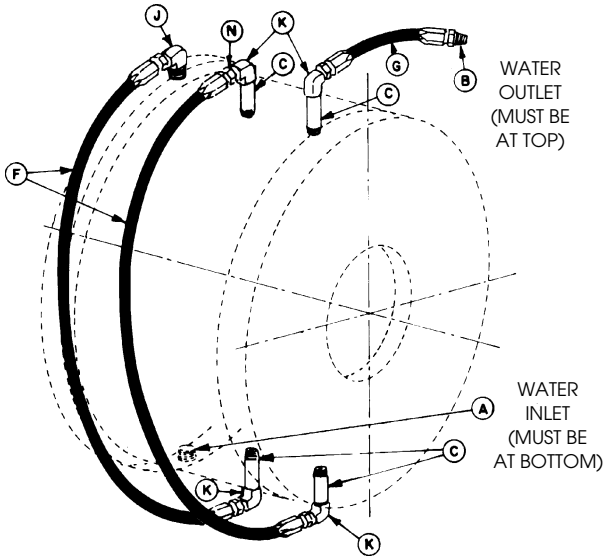
Wichita Water Hose kits contain all necessary fittings, hoses, and connections to completely plumb the brake water system. Customer needs to connect water input at the bottom of the brake and the output water connections at the top of the brake.



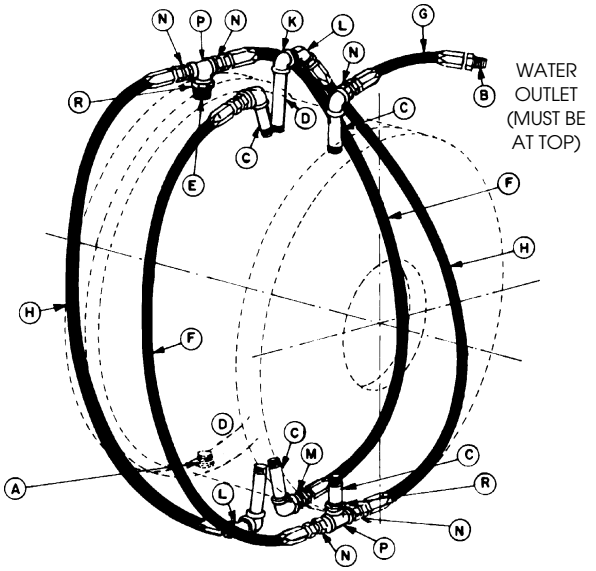
Single plate

Model No. ATD-	Water Hose Kit Number*	A Inlet Size	B Inlet Size	C Pipe Nipple Part Number	Qty	D Pipe Nipple Part Number	Qty	E Pipe Nipple Part Number	Qty	F Hose Part Number	Qty	G Hose Part Number	Qty
108 KKB	8-908-999-901-5	3/8" NPT	3/8" NPT	2-200-036-122-0	2	—	—	—	—	2-403-240-033-1	1	2-403-110-133-1	1
208 KKB	8-908-999-902-5	3/8" NPT	3/8" NPT	2-200-036-122-0	4	—	—	—	—	2-403-240-033-1	2	2-403-110-133-1	1
308 KKB	8-908-999-903-5	3/8" NPT	3/8" NPT	2-200-036-122-0	6	—	—	—	—	2-403-240-033-1	3	2-403-110-133-1	1
114 KKB	8-914-999-901-6	1/2" NPT	3/4" NPT	2-200-037-122-0	2	—	—	—	—	2-404-320-044-1	1	2-404-110-144-1	1
214 KKB	8-914-999-902-6	1/2" NPT	3/4" NPT	2-200-037-122-0	4	—	—	—	—	2-404-320-044-1	2	2-404-110-144-1	1
314 KKB	8-914-999-903-6	1/2" NPT	3/4" NPT	2-200-037-122-0	6	—	—	—	—	2-404-320-044-1	3	2-404-110-144-1	1
118 KKB	8-918-999-901-6	1/2" NPT	3/4" NPT	2-200-037-122-0	2	—	—	—	—	2-404-380-044-1	1	2-404-110-144-1	1
218 KKB	8-918-999-902-6	1/2" NPT	3/4" NPT	2-200-037-122-0	4	—	—	—	—	2-404-380-044-1	2	2-404-110-144-1	1
318 KKB	8-918-999-903-6	1/2" NPT	3/4" NPT	2-200-037-122-0	6	—	—	—	—	2-404-380-044-1	3	2-404-110-144-1	1
124H SWCB	8-924-999-901-6	1/2" NPT	3/4" NPT	2-200-060-122-0	2	—	—	—	—	2-404-500-044-1	1	2-404-110-144-1	1
224H SWCB	8-924-999-902-6	1/2" NPT	3/4" NPT	2-200-060-122-0	4	—	—	—	—	2-404-500-044-1	2	2-404-110-144-1	1
324H SWCB	8-924-999-903-6	1/2" NPT	3/4" NPT	2-200-060-122-0	6	—	—	—	—	2-404-500-044-1	3	2-404-110-144-1	1
124H KKB	9-925-999-901-7	1" NPT	1" NPT	2-200-051-122-0	2	—	—	—	—	2-405-500-055-1	1	2-405-110-155-1	1
224H KKB	8-925-999-902-7	1" NPT	1" NPT	2-200-051-122-0	4	2-200-082-122-0	2	2-200-017-122-0	1	2-405-500-055-1	2	2-405-110-155-1	1
324H KKB	8-925-999-903-7	1" NPT	1" NPT	2-200-051-122-0	6	2-200-082-122-0	4	2-200-017-122-0	1	2-405-500-055-1	3	2-405-110-155-1	1
130 SWCB	8-930-999-901-7	3/4" NPT	1"NPT	2-200-061-122-0	2	—	—	—	—	2-405-620-055-1	1	2-405-200-155-1	1
230 SWCB	8-930-999-902-7	3/4" NPT	1" NPT	2-200-061-122-0	4	—	—	—	—	2-405-620-055-1	2	2-405-200-155-1	1
330 SWCB	8-930-999-903-7	3/4" NPT	1" NPT	2-200-061-122-0	6	—	—	—	—	2-405-620-055-1	3	2-405-200-155-1	1
130 KKB	8-930-999-901-9	1" NPT	1-1/2" NPT	2-200-062-122-0	2	—	—	—	—	2-407-620-077-1	1	2-407-200-177-1	1
230 KKB	8-930-999-902-9	1"NPT	1-1/2" NPT	2-200-062-122-0	4	2-200-092-122-0	2	2-200-017-122-0	1	2-407-620-077-1	4	2-407-200-177-1	1
330 KKB	8-930-999-903-9	1" NPT	1-1/2" NPT	2-200-062-122-0	6	2-200-092-122-0	4	2-200-017-122-0	1	2-407-620-077-1	3	2-407-200-177-1	1
136 SWCB	8-936-999-901-7	3/4" NPT	1" NPT	2-200-061-122-0	2	—	—	—	—	2-405-680-055-1	1	2-405-200-155-1	1
236 SWCB	8-936-999-902-7	3/4" NPT	1" NPT	2-200-061-122-0	4	—	—	—	—	2-405-680-055-1	2	2-405-200-155-1	1
336 SWCB	8-936-999-903-7	3/4" NPT	1" NPT	2-200-061-122-0	6	—	—	—	—	2-405-680-055-1	3	2-405-200-155-1	1
136H KKB	8-937-999-901-9	1-1/4" NPT	1-1/2" NPT	2-200-063-122-0	2	—	—	—	—	2-407-680-077-1	1	2-407-200-155-1	1
236H KKB	8-937-999-902-9	1-1/4" NPT	1-1/2" NPT	2-200-063-122-0	4	2-200-104-122-0	2	2-200-018-122-0	1	2-407-680-077-1	2	2-407-200-155-1	1
336H KKB	8-937-999-903-9	1-1`/4" NPT	1-1/2" NPT	2-200-063-122-0	6	2-200-104-122-0	4	2-200-018-122-0	1	2-407-680-077-1	3	2-407-200-155-1	1

* Denotes complete hose kit



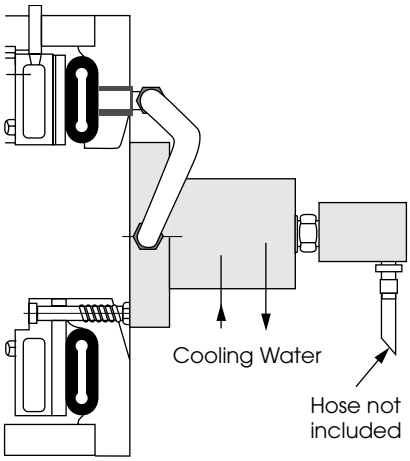
Double Plate
Sizes 208 through 318

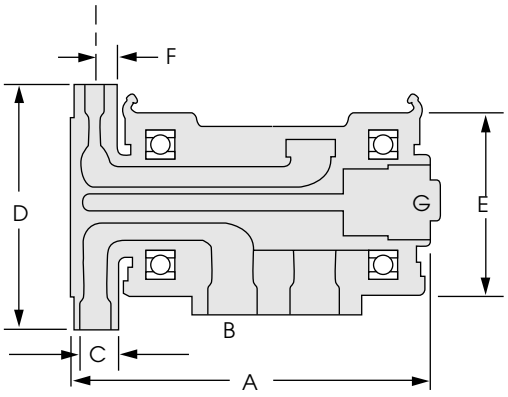


Double Plate
Sizes 224H through 336H

Model No. ATD-	H Hose Part Number	Qty	J Elbow 90 Part Number	Qty	K Elbow 90 Part Number	Qty	L Elbow 45 Part Number	Qty	M Adaptor Part Number	Qty	N Adaptor Part Number	Qty	P Pipe Tee Part Number	Qty
108 KKB	—	—	2-303-027-020-0	1	2-302-027-020-0	2	—	—	—	—	—	—	—	—
208 KKB	—	—	2-303-027-020-0	1	2-302-027-020-0	4	—	—	—	—	—	—	—	—
308 KKB	—	—	2-303-027-020-0	1	2-302-027-020-0	6	—	—	—	—	—	—	—	—
114 KKB	—	—	2-303-039-020-0	1	2-302-039-020-0	2	—	—	—	—	—	—	—	—
214 KKB	—	—	2-303-039-020-0	1	2-302-039-020-0	4	—	—	—	—	—	—	—	—
314 KKB	—	—	2-303-039-020-0	1	2-302-039-020-0	6	—	—	—	—	—	—	—	—
118 KKB	—	—	2-303-039-020-0	1	2-302-039-202-0	4	—	—	—	—	—	—	—	—
218 KKB	—	—	2-303-039-020-0	1	2-302-039-202-0	6	—	—	—	—	—	—	—	—
318 KKB	—	—	2-303-039-020-0	1	2-302-039-202-0	4	—	—	—	—	—	—	—	—
124H SWCB	—	—	2-303-039-020-0	1	2-302-039-202-0	6	—	—	—	—	—	—	—	—
224H SWCB	—	—	2-303-039-020-0	1	2-302-039-202-0	6	—	—	—	—	—	—	—	—
324H SWCB	—	—	2-303-062-001-0	1	2-302-062-001-0	2	—	—	—	—	—	—	—	—
124H KKB	2-405-500-055-1	2	—	—	2-302-062-001-0	5	2-307-062-001-0	2	2-300-062-001-0	2	2-300-062-001-0	5	2-214-041-412-0	2
224H KKB	2-405-500-055-1	3	—	—	2-302-062-001-0	9	2-307-062-001-0	4	2-300-062-001-0	4	2-300-062-001-0	5	2-214-041-412-0	2
324H KKB	—	—	2-303-051-001-0	1	2-210-036-112-0	2	—	—	—	—	—	—	2-300-062-001	2
130 SWCB	—	—	2-203-051-001-0	1	2-210-036-112-0	4	—	—	—	—	—	—	2-300-062-001-0	4
230 SWCB	—	—	2-303-064-001-0	1	2-210-041-112-0	6	—	—	—	—	—	—	2-300-062-001-0	6
330 SWCB	—	—	2-303-064-001-0	1	2-210-041-112-0	2	—	—	—	—	—	—	2-300-064-001-0	2
130 KKB	—	—	2-210-041-112-0	5	2-307-064-001-0	2	2-300-064-001	2	2-300-064-001-0	5	2-214-041-112-0	2	—	—
230 KKB	—	—	2-407-620-077-1	3	2-210-041-112-0	9	2-307-064-001-0	4	2-300-064-001-0	4	2-300-064-001-0	5	2-214-041-112-0	29
330 KKB	—	—	2-303-051-001-0	1	2-210-036-112-0	2	—	—	—	—	—	—	2-300-062-001-0	2
136 SWCB	—	—	2-303-051-001-0	1	2-210-036-112-0	4	—	—	—	—	—	—	2-300-062-001-0	4
236 SWCB	—	—	2-303-051-001-0	1	2-210-036-112-0	6	—	—	—	—	—	—	2-300-062-001-0	6
336 SWCB	—	—	2-303-075-001-0	1	2-210-046-112-0	2	—	—	—	—	—	—	2-300-075-001-0	2
136H KKB	2-407-660-077-1	2	—	—	2-210-046-112-0	5	2-300-075-001-0	2	2-300-075-001-0	2	2-300-075-001-0	5	2-214-073-112-0	2
236H KKB	2-407-660-077-1	3	—	—	2-210-046-112-0	9	2-300-075-001-0	4	2-300-075-001-0	4	2-300-075-001-0	5	2-214-073-112-0	2
336H KKB														

3-Way Roto-Coupling (for water-cooled Clutches)





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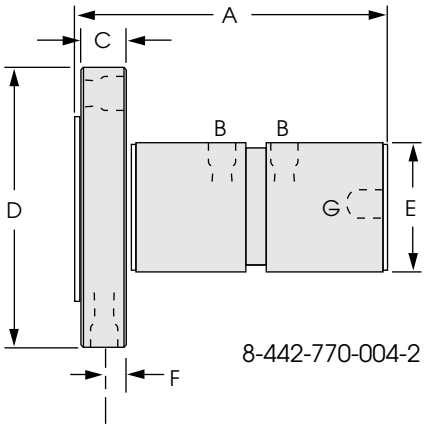

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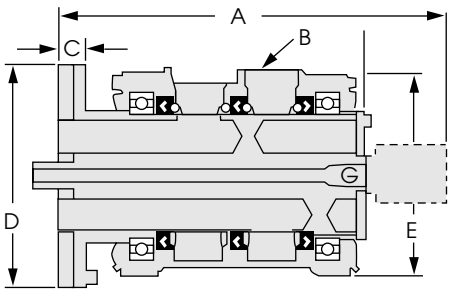
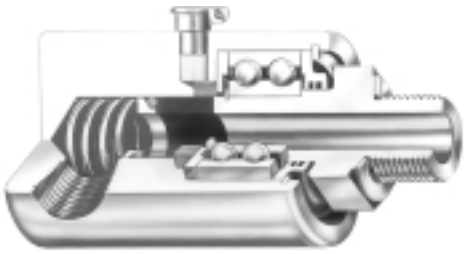


8-442-776-000-1

Dimensions

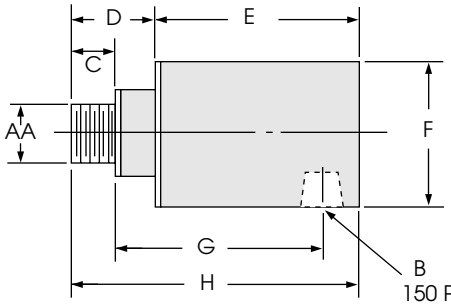
Wichita Part No.	A	B	C	D	E	F	Thread Size G	H
8-442-770-004-2	7-1/4"	3/8"–18 NPT	1"	6-1/2"	3"	1/2"	5/8"–18	—
8-442-774-006-1	11"	1-1/4"–11-1/2 NPT	1-3/8"	7-1/4"	5-3/8"	11/16"	1/4" NPT	—
8-442-776-000-1	18-7/8"	2"–11-1/2 NPT	1-1/4"	10"	9"	—	1"–14	3-3/4"

Roto-couplings



- Long life, low maintenance.
- Felt seal eliminates bearing contamination.
- Fast, easy installation.

The Wichita Roto-coupling is a device to connect, or couple, a non-rotating air, gas, or fluid line to a rotating shaft.



Wichita Part No.	AA	B	C	D	E	F	G	H	Max. R.P.M.
8-240-701-003-1	5/8-18NF	1/4" NPT	.40	1.046	2.250	1.500	2.13	3.297	3500
8-240-705-001-1	1"-14 NF	1/2" NPT	.75	1.250	3.188	2.500	3.00	4.438	3500
8-240-708-001-1	1"-14 NF	3/4" NPT	.75	1.313	4.688	2.875	3.69	5.440	3500
8-240-710-002-1	1-1/2"-12 NF	1" NPT	1.13	1.937	4.875	3.250	3.44	6.812	2500
8-240-712-001-1	2"-12 NF	1-1/2" NPT	1.13	2.813	5.250	4.250	5.38	8.062	2500
8-240-714-001-3	2" NPT	2" NPT	1.50	3.000	7.062	4.625	7.00	10.062	1000
8-240-716-000-3	2-1/2" NPT	2-1/2" NPT	1.88	3.250	9.375	7.000	7.75	12.625	750

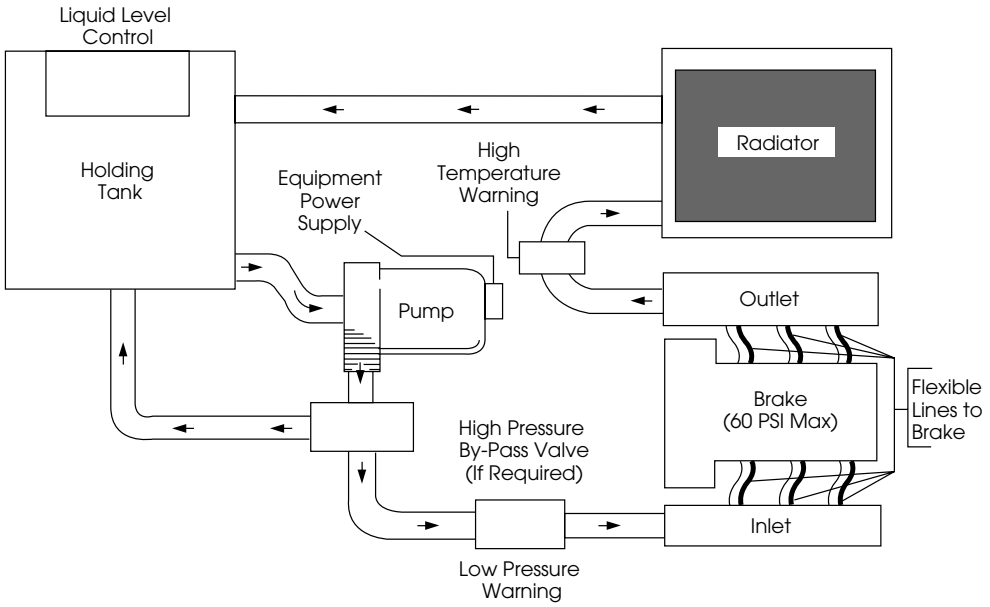
Notes: All measurements are in inches.

Principle of Operation

Closed Cooling System

As shown here in the closed loop system, flexible water lines should be brought into each jacket at the 6 o'clock position. When the Kopper Kool Unit is used as a clutch, air vent tubes must be installed internally at the factory to insure proper filling of the water jackets. The Kopper Kooled Clutches also require 5 PSI back pressure on the outlet side of the triple passage rotocoupling to insure complete evacuation of air from these jackets during rotation.

Referring to the closed loop cooling system, the equipment should be protected with low water pressure and high temperature warning devices. For availability information, contact factory.



C

Tension Brakes/Air Cooled

Magnum Brakes

The Wichita Magnum Brake sets new standards in performance, safety and serviceability. The Magnum is easy to apply and simple to service. It offers high heat dissipation capability for continuous operation and dynamic torque capacities to 14,160 lb.in.

See pages 81 thru 85.

EP – Extra Performance Brakes

Wichita's EP is a modular design brake available in three sizes. Torque can be varied both by changing air pressure and controlling individual friction elements. External fins assure maximum heat dissipation. Optional wire guard protects personnel, allows continued air movement.

See pages 86 thru 91.

Mistral Brakes

Specifically designed for the corrugating industry, Wichita's new Mistral mill roll stand tension brake handles the demanding tensioning requirements of modern corrugating equipment's higher 1140 ft./minute speeds. Dynamic torque to 5310 lb.in., up to 3.5 thermal horsepower.

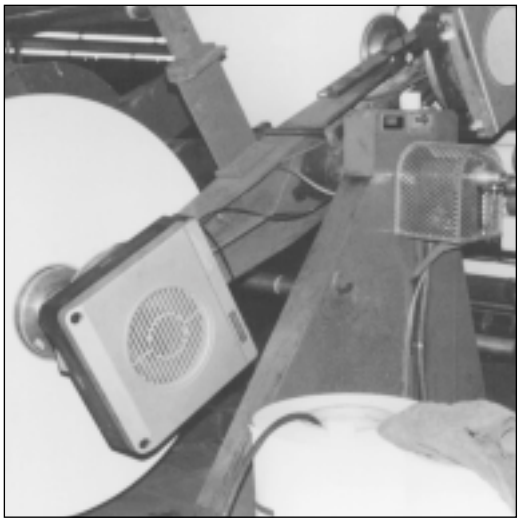
See pages 92 thru 95.

Magnum Brakes

Totally enclosed, no guard required

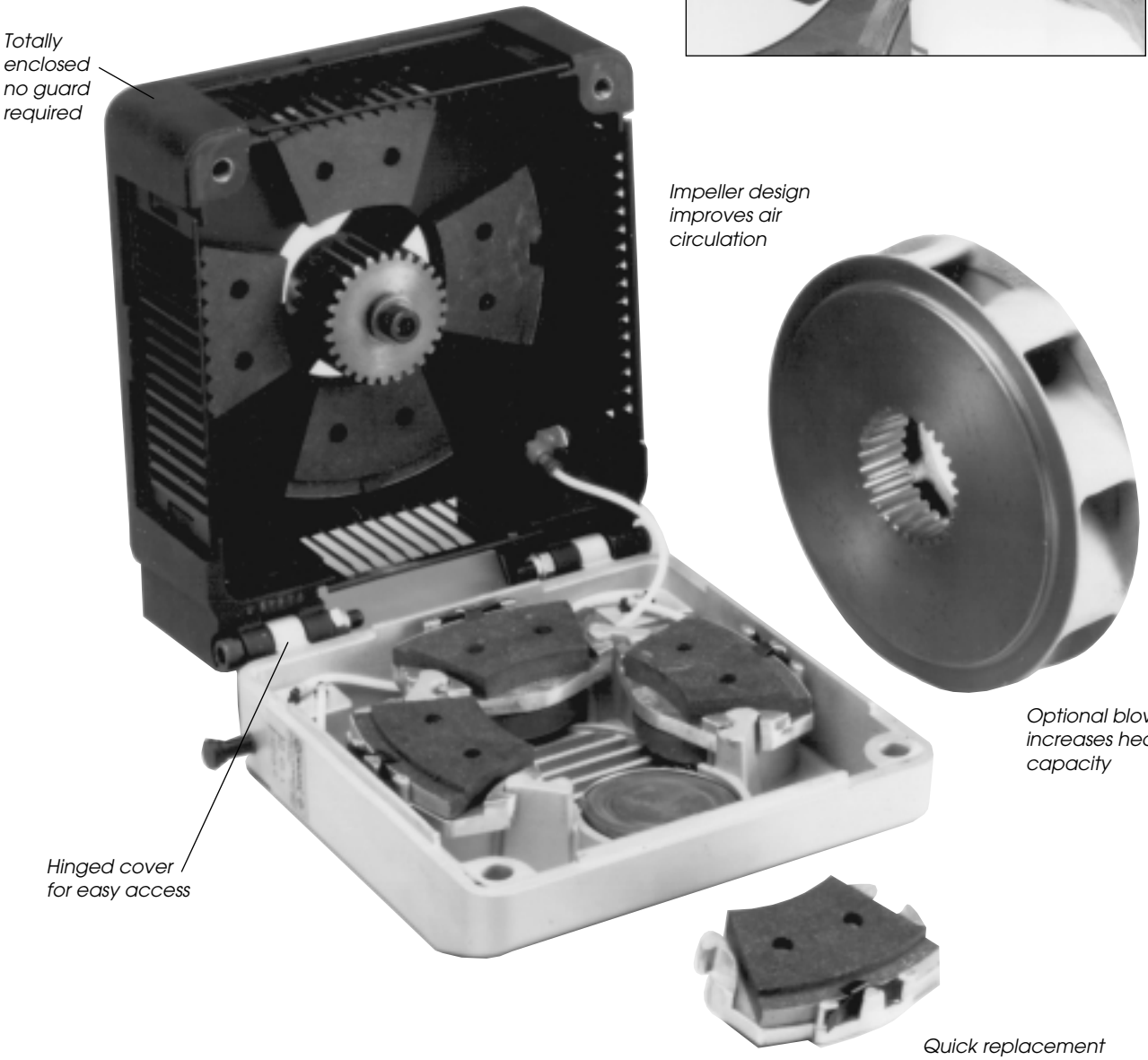
Wide range of torque capacities

Wichita's Magnum series of unwind tension brakes offer high performance in compact, easy to install packages. Air vents and an impeller-type disk are tuned to achieve highly efficient air flow. Heat dissipation is further enhanced by the use of an integral fan (optional). Four sizes are available with torque capacities from 17 lb.in. through 14,160 lb.in.



Totally enclosed no guard required

Impeller design improves air circulation



Optional blower increases heat capacity

Hinged cover for easy access

Quick replacement friction pads

Magnum Brakes

Tension brakes are selected by calculating the thermal energy (heat) generated during the unwind and choosing a brake with an equal or greater heat dissipation rating. The brake selection is then based on:

1. Maximum roll speed
2. Maximum torque needed to produce desired tension
3. Brake's heat dissipation capacity
4. Brake's maximum bore

Selecting a Brake for an unwind application

To properly select a tension brake for an unwind application, the following information is needed:

Max. Roll Dia. . . . . 60 in.
Max. Web Width . . . . . 36 in.
Max. Web Speed . . . . . 1200 fpm
Max. Tension . . . . . 2.0 pli
Air Pressure Available . . . . . 80 psi
Min. Roll Dia. . . . . 6 in.
Min. Web Width . . . . . 34 in.
Min. Web Speed . . . . . 400 fpm
Min. Tension . . . . . 1.5 pli
Shaft Size 2.00

Calculations

Using the calculations below, consult the Specifications Chart on page 83.

The brake selected for this application is a Magnum 340/3 with 2.00 bore.

Max. Tension = Max pli x Max. Web Width
= 2 x 36 = 72 lbs.

$$\text{Max. Torque} = \frac{\text{Max. Tension x Max. Roll Dia.}}{2}$$
= 72 x 60/2 = 2,160 lb.in.

$$\text{Max. rpm} = \frac{\text{Max. Web Speed x 3.82}}{\text{Min. Roll Dia.}}$$
= 1,200 x 3.82/6 = 764 rpm

Effective Cooling Speed (rpm)

$$= \frac{\text{Max. Web Speed x 7.64}}{\text{(Max. Roll Dia. + Min. Roll Dia.)}}$$

$$= \frac{1200 \times 7.64}{(60 + 6)} = 139 \text{ rpm}$$

Heat H.P. = Max. Tension x Max Web Speed/33,000
= 72 x 1200/33,000 = 2.6 Heat HP

Min. Tension = Min.pli x Min. Web Width
= 1.5 x 34 = 51 lbs.

$$\text{Min. Torque} = \frac{\text{Min. Tension x Min. Roll Dia.}}{2}$$
= 51 x 6/2 = 153 lb.in.

$$\text{Min. rpm} = \frac{\text{Min. Web Speed x 3.82}}{\text{Max. Roll Dia.}}$$
= 400 x 3.82/60 - 25.5 rpm

How to Select

1. Select a brake with equal or greater thermal capacity. The 340/3 has 2.9 hp @ 139 rpm. The requirement is 2.6 thp @ 139 rpm.
2. Check torque capacity vs. required 340/3 = 3090 lb.-in. @ 80 psi. The requirement equals 2160 lb.in.
3. Check Maximum Bore. The requirement is 2.00 in. The 340/3 maximum bore is 2.25 inches.
4. Check Maximum rpm. The requirement is 764 rpm. The maximum rpm for the 340/3 is 2040 rpm with standard disc.

$$\text{Max. Air Pressure Required} = \frac{\text{Max. Torque x 80 psi}}{\text{Catalog Torque Rating}}$$
= 2,160 x 80/3090 = 56 psi

$$\text{Min. Air Pressure Required} = \frac{\text{Min. Torque x 80 psi}}{\text{Catalog Torque Rating}}$$

With Three Actuators = 153 x 80/3090 = 4 psi

With One Actuators = 153 x 80/1030 = 12 psi

Specifications

Model No.	Dynamic Slipping Torque Cap. lb.in.[1] Min 3 PSI	Max 80 PSI	Brake	Heat Transfer Capacity for Continuous Operation HP[2] HP Heat Transfer Cap. Forced Cooled at 50 rpm	100 rpm	200 rpm	500 rpm	Maximum Speed (rpm) Medium Speed brake disc (rpm)	High Speed brake disc (rpm)	Inertia of brake disc + hub lb.ft.²	Weight Total Brake lb.	Brake disc + Hub lb.
260/1LC	17	440	Mag.	1.3	1.5	1.9	2.9	2530	4427	.74	31	13.7
260/1	26	660										
260/2LC	43	880										
260/2	60	1320										
260/3LC	60	1320	Mag.+	1.7 FAN	2.1 FAN	2.8 FAN	4.0 FAN					
260/3	85	1980										
260/4LC	85	1760										
260/4	113	2640										
340/1LC	35	687	Mag.	2.3	2.7	3.3	4.7	2040	3570	2.4	45	23
340/1	43	1030										
340/2LC	70	1373										
340/2	86	2060	Mag. B	3.6 FAN	4.0 FAN	4.8 FAN	5.6 FAN					
340/3LC	95	2060										
340/3	129	3090										
340/4LC	129	2748	Mag.+	3.9 FAN	4.3 FAN	5 FAN	5.7 FAN					
340/4	172	4120										
340/5LC	163	3435										
340/5	215	5150										
340/6LC	198	4120										
340/6	258	6180										
400/2LC	86	1774	Mag.	3.5	4.0	5.2	8.8	1712	2996	5.7	71	41
400/2	113	2660										
400/3LC	129	2660										
400/3	172	3990										
400/4LC	172	3548	Mag.B	4.9 FAN	5.7 FAN	7.1 FAN	8.8 FAN					
400/4	225	5320										
400/5LC	215	4435										
400/5	286	6650										
400/6LC	252	5322	Mag.+	6.0 FAN	7.0 FAN	8.4 FAN	9.4 FAN					
400/6	238	7980										
400/7LC	285	6210										
400/7	400	9310										
400/8LC	338	7096										
400/8	451	10640										
500/2LC	113	2360	Mag.	4.7	6.0	8.7	14.7	1308	2289	17	127	60
500/2	146	3540										
500/3LC	172	3540										
500/3	225	5310										
500/4LC	225	4720	Mag.B	10.0 FAN	11.4 FAN	12.6 FAN	14.7 FAN					
500/4	304	7080										
500/5LC	286	5900										
500/5	382	8850										
500/6LC	338	7080	Mag.+	10.7 FAN	12.0 FAN	13.4 FAN	16.8 FAN					
500/6	451	10620										
500/7LC	400	8260										
500/7	530	12390										
500/8LC	451	9440										
500/8	608	14160										

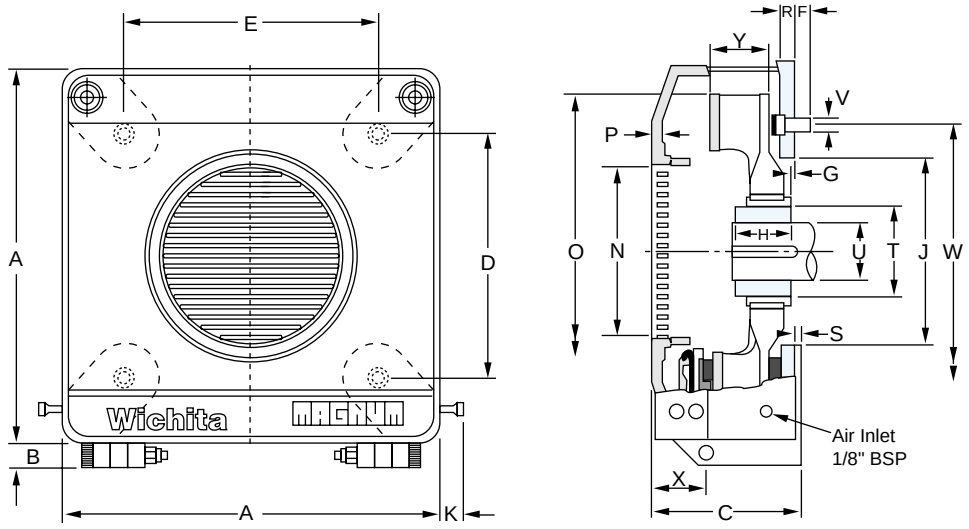
[1] The dynamic slipping torque range for a given brake model can be changed by switching the actuators in or out by means of the hand slide valves provided e.g. a 340/3 to a 340/2 or a 340/1.

[2] The heat transfer ratings in the above chart assume a forward rotation of the brake disc. For reverse rotation the heat ratings of models Magnum 260 and Magnum 340 should be reduced by 15%. If in doubt please contact your Wichita engineer.

C

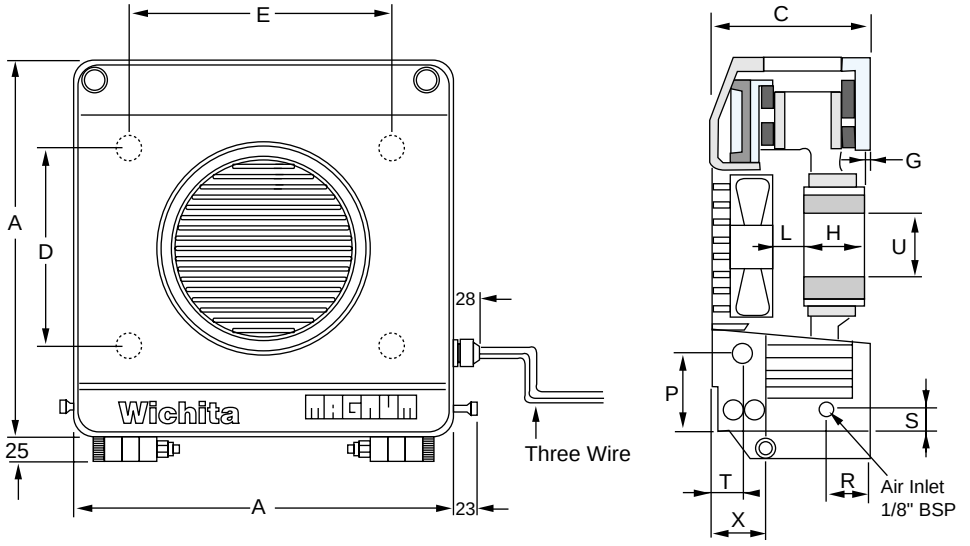
Magnum Brakes

Magnum

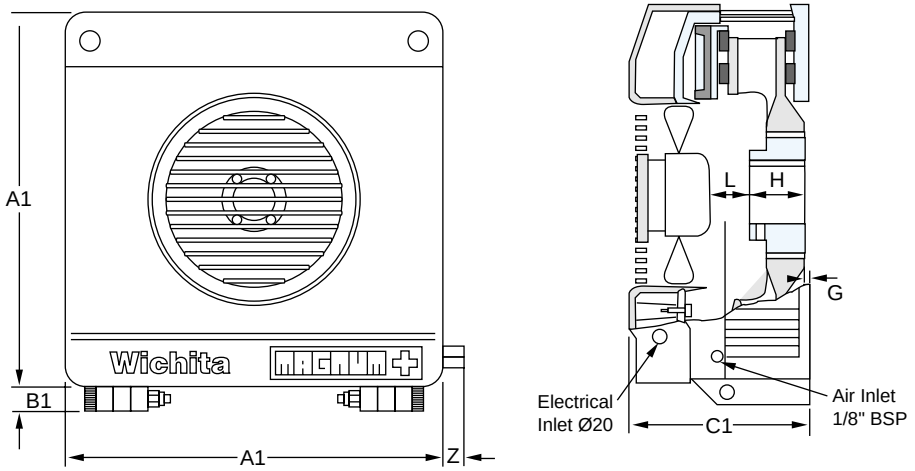


New!

Magnum B



Magnum Plus



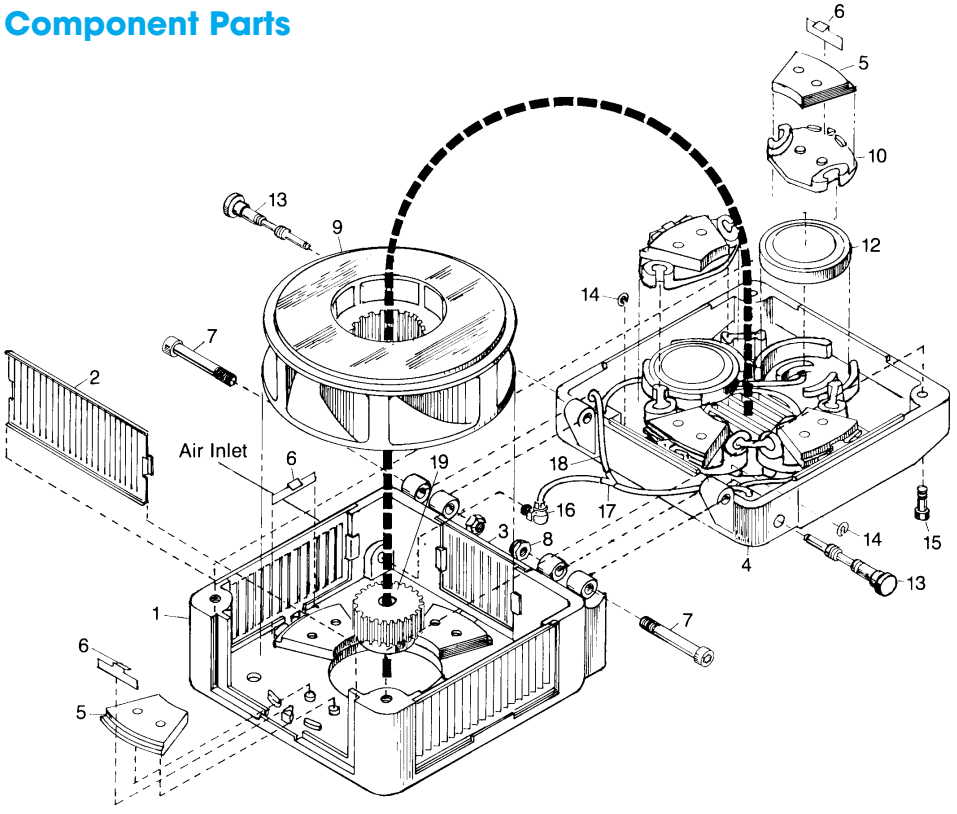
Dimensions (mm) (Consult factory for drawing before final layout.)

Model No.	A	A1	B	B1	C	C1	D	E	F	G	H	J	K
260	10.4 (264)	10.6 (270)	1.0 (25)	0.8 (20)	5.7 (145)	7.7 (195)	7.0 (176.8)	7.0 (176.8)	0.8 (20)	0.2 (5)	2.2 (55)	3.9 (100)	0.9 (23)
340	13.6 (346)	13.8 (350)	1.0 (25)	0.8 (20)	5.7 (145)	8.0 (205)	5.5 (140.0)	9.5 (242.5)	0.9 (22)	0.2 (5)	2.2 (55)	6.9 (175)	0.9 (23)
400	16 (406)	16.1 (410)	1.0 (25)	0.8 (20)	5.7 (145)	7.7 (195)	10.4 (265.2)	10.4 (265.2)	1.1 (27)	0.2 (5)	2.4 (60)	7.9 (200)	0.9 (23)
500	19.9 (506)	2.0 (510)	1.1 (28)	0.8 (20)	5.7 (150)	8.0 (205)	13.3 (339.4)	13.3 (339.4)	1.2 (30)	0.2 (5)	2.4 (60)	12.6 (320)	0.9 (23)

Model No.	L	N	O	P	R	S	T	U Min	U Max	V	W PCD	X	Y	Z
260	2.0 (50)	3.7 (95)	9.0 (230)	.24 (6)	.59 (15)	.20 (5)	2.44 (62)	.59 (15)	1.77 (45)	4 off-M12 X 35	9.84 (250)	1.969 (50)	2.36 (60)	.47 (12)
340	2.0 (50)	5.5 (14)	11.0 (280)	.24 (6)	.51 (13)	.28 (7)	3.62 (92)	.98 (25)	2.24 (57)	4 off-M12 x 30	11.02 (280)	1.969 (50)	2.32 (59)	.47 (12)
400	1.0 (25)	7.9 (200)	13.4 (340)	.31 (8)	.51 (13)	.12 (3)	4.69 (119)	1.38 (35)	2.56 (65)	4 off-M16 x 40	14.76 (375)	2.047 (52)	2.36 (60)	.47 (12)
500	1.0 (25)	11.1 (283)	17.5 (445)	.44 (11)	.59 (15)	.08 (2)	5.6 (140)	1.38 (35)	4.08 (102)	4 off-M20 x 45	18.1 (480)	2.2 (55)	2.32 (59)	.47 (12)

Certified prints showing exact dimensions are sent with every order acknowledgement, and these should always be obtained before finalizing any design detail.
Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a or ASTM-574M-97a (Metric Version).

Component Parts

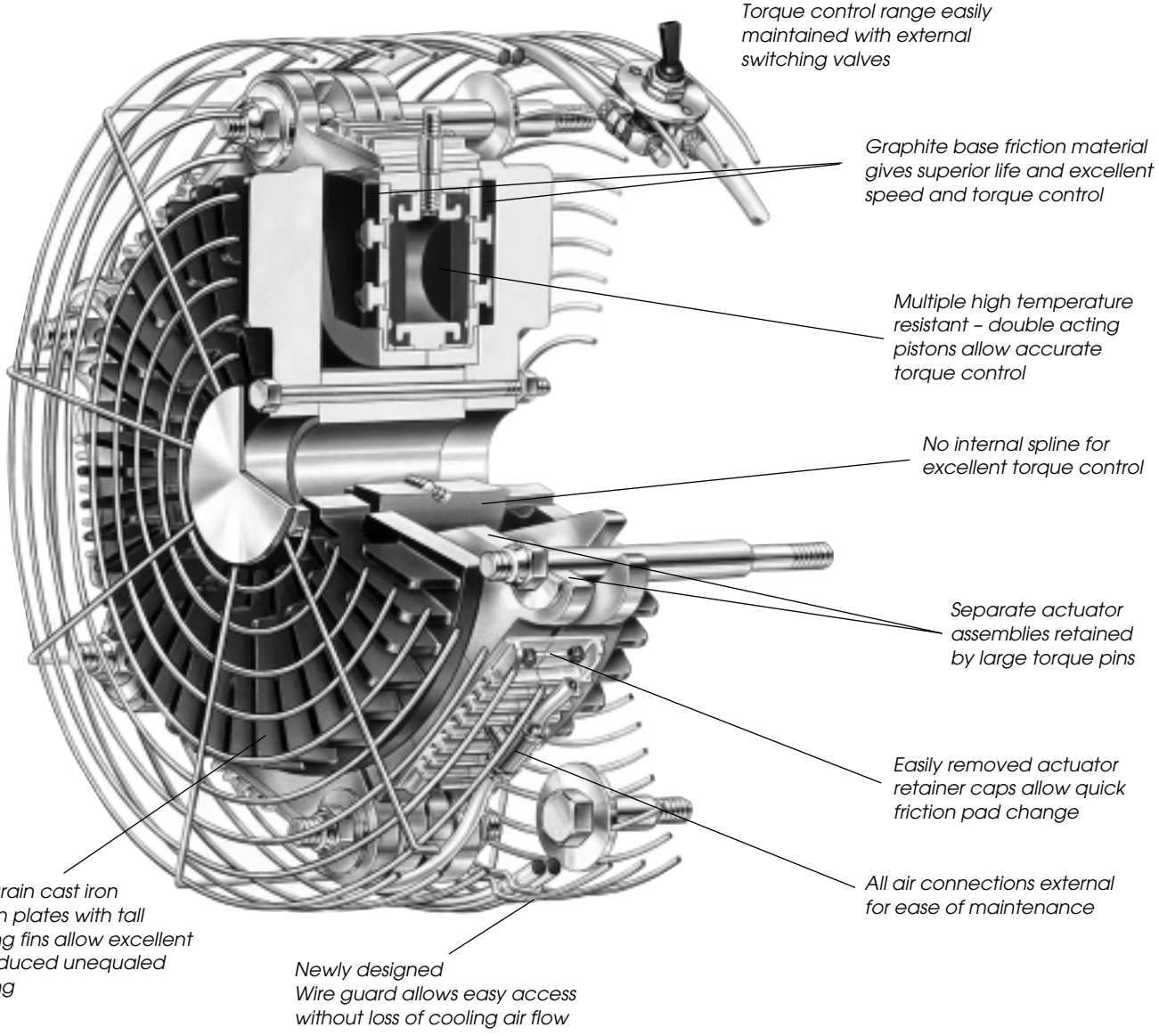


1. Back Casing
2. Side Guard
3. Side Guard
4. Front Casing
5. Friction Pad
6. Retaining Clip
7. Socket Head Bolt
8. Self-locking Nut
9. Brake Disc
10. Carrier Plate
12. Actuator Assembly
13. Air Valve
14. Retaining Ring
15. Socket Head Bolt
16. 90° Elbow
17. "Y" Connector
18. Air Hose
19. Hub

Tension Brakes/Air Cooled

EP – Extra Performance

Accurate, consistant torque



EP tension brakes are air-cooled and have a modular actuator design. The ability to switch out actuators allows a wide torque range. These brakes provide accurate, repeatable web tension. Available with multiple control options from simple air valves to closed-loop microprocessor based controls.

Features

- Air cooled for greater stability and longer life
- Modular actuator design provides wide torque range
- Accurate and consistent
- Quick replacement or friction pads
- Up to 28 thermal horse power

Specifications

The Wichita EP has a broad range of both torque and heat capacity, which allow application virtually anywhere there is a need for unwind control.

Although the torque and heat capacity will vary with the speed and air pressure of the application, the charts and tables on pages 88 and 89 demonstrate the general capabilities of the product.

All products mentioned in this section are brake only devices. Should the need for a tension clutch arise, please contact the factory as these products are available as well.

Rotor Inertia and Weights

Brake Size	Rotor and Hub* Total Weight (lbs)	Total Brake Inertia lb.ft²
10"	28.3	2.6
13"	53.2	6.5
16"	81.0	23.7

*Both Rotor and Hub Rotate

Typical Applications

Load Cell Control System

Dancer Tension Control System

Analog Tension Control System

C

EP – Extra Performance

Tension brakes are selected by calculating the thermal energy (heat) generated during the unwind and choosing a brake with an equal or greater heat dissipation rating. The brake selection becomes based on:

1. Maximum roll speed
2. Maximum torque needed to produce desired tension
3. Brake's heat dissipation capacity
4. Brake's maximum bore

Selecting an EP Brake for an unwind application

To properly select a tension brake for an unwind application, the following information is needed:

Max. Roll Dia. . . . . 60 in.
Max. Web Width . . . . . 36 in.
Max. Web Speed . . . . . 1200 fpm
Max. Tension . . . . . 2 pli
Air Pressure Available . . . . . 75 psi
Min. Roll Dia. . . . . 6 in.
Min. Web Width . . . . . 34 in.
Min. Web Speed . . . . . 400 fpm
Min. Tension . . . . . 1.5 pli
Shaft Size 2.75

Calculations

Using the calculations below, consult the charts on the following page.

The brake selected for this application is a Model 133 with 2.75 bore.

Max. Tension = Max pli x Max. Web Width
= 2 x 36 = 72 lbs.

$$\text{Max. Torque} = \frac{\text{Max. Tension x Max. Roll Dia.}}{2}$$
= 72 x 60/2 = 2,160 lb.in.

$$\text{Max. rpm} = \frac{\text{Max. Web Speed x 3.82}}{\text{Min. Roll Dia.}}$$
= 1,200 x 3.82/6 = 764 rpm

Effective Cooling Speed (rpm)

$$= \text{Min. rpm} + \frac{\text{Max. rpm - Min. rpm}}{10}$$

$$= 25.5 + \frac{7.64 - 25.5}{10} = 99 \text{ rpm}$$

Heat HP = Max. Tension x Max Web Speed/33,000
= 72 x 1200/33,000 = 2.6 Heat HP

Min. Tension = Min.pli x Min. Web Width
= 1.5 x 34 = 51 lbs.

$$\text{Min. Torque} = \frac{\text{Min. Tension x Min. Roll Dia.}}{2}$$
= 51 x 6/2 = 153 lb.in.

$$\text{Min. rpm} = \frac{\text{Min. Web Speed x 3.82}}{\text{Max. Roll Dia.}}$$
= 400 x 3.82/60 - 25.5 rpm

How to Select

1. Select a brake with equal or greater thermal capacity. All 13" models have 3 hp @ 99 rpm. The requirement is 2.6 thp @ 99 rpm. See Thermal Horsepower Selection on page 89.
2. Check torque capacity vs. required. 133 has 2,850 lb.in. @ 75 psi. The requirement equals 2160 lb.in. See Capacities on page 89.
3. Check Maximum Bore. The requirement is 2.75 in. The Model 133 maximum bore is 3.00 inches.
4. Check Maximum rpm. The requirement is 764 rpm. The maximum rpm for the 133 is 3000 rpm.

$$\text{Max. Air Pressure Required} = \frac{\text{Max. Torque x 75psi}}{\text{Catalog Torque Rating}}$$
= 2,160 x 75/2,850= 57 psi

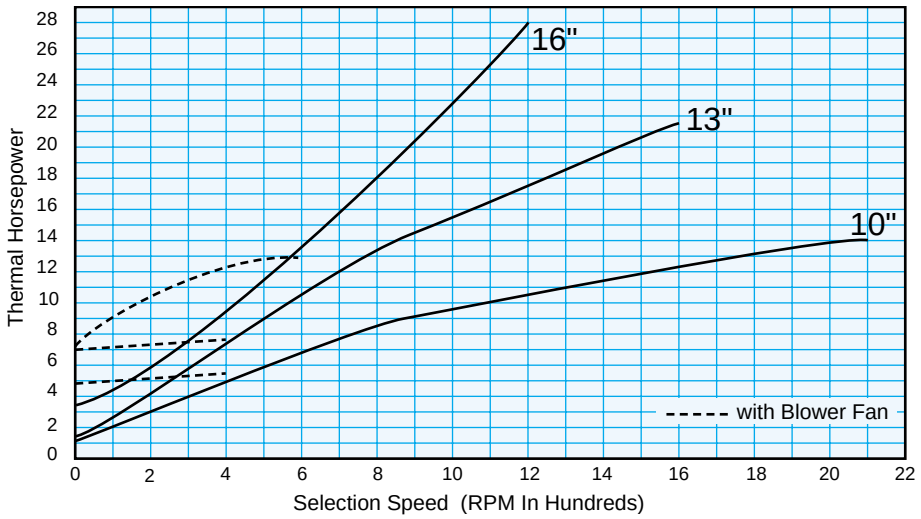
$$\text{Min. Air Pressure Required} = \frac{\text{Min. Torque x 75psi}}{\text{Catalog Torque Rating}}$$

With Three Actuators = 153 x 75/2,850 = 4 psi

With One Actuators = 153 x 75/950 = 12 psi

Wichita EP Tension Brakes offer optimum performance when paired with the Wichita Micro-Controller.

Thermal Horsepower Selection

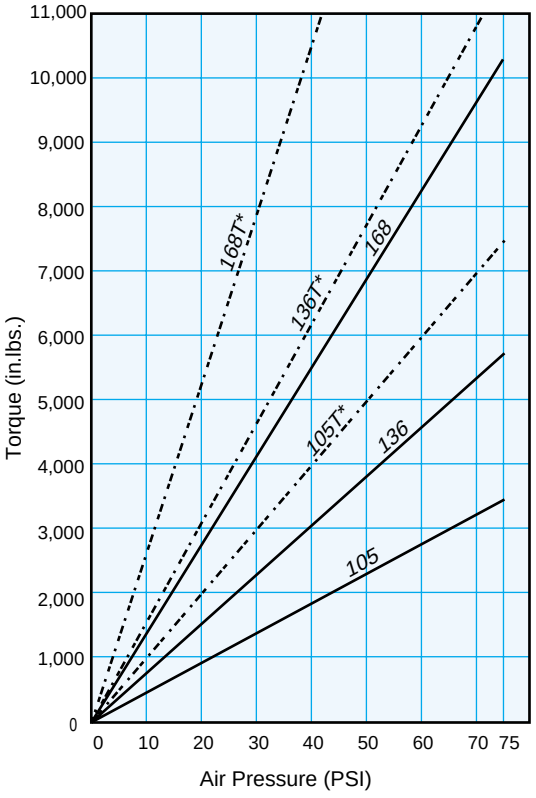


Capacities

Model No.	Dia. of Friction Plates	No. of Actuators	Approx. Total Weight (lbs.)	Max. Speed (RPM)	Rated Torque At 75 PSI Air Pressure lb. in./lb. ft.
101	10"	1	50	3,800	700/58
101T	10"	1	50	3,800	1,470/120
102	10"	2	53	3,800	1,400/117
102T	10"	2	53	3,800	2,940/245
103	10"	3	56	3,800	2,100/175
103T	10"	3	56	3,800	4,410/365
104	10"	4	59	3,800	2,800/233
104T	10"	4	59	3,800	5,880/490
105	10"	5	62	3,800	3,500/292
105T	10"	5	62	3,800	7,350/610
131	13"	1	78	3,000	950/79
131T	13"	1	78	3,000	1,995/165
132	13"	2	81	3,000	1,900/158
132T	13"	2	81	3,000	3,990/330
133	13"	3	84	3,000	2,850/238
133T	13"	3	84	3,000	5,985/495
134	13"	4	87	3,000	3,800/317
134T	13"	4	87	3,000	7,980/665
135	13"	5	90	3,000	4,750/396
135T	13"	5	90	3,000	9,975/830
136	13"	6	93	3,000	5,700/475
136T	13"	6	93	3,000	11,970/995
161	16"	1	111	2,400	1,275/106
161T	16"	1	111	2,400	2,675/220
162	16"	2	114	2,400	2,550/213
162T	16"	2	114	2,400	5,355/445
163	16"	3	117	2,400	3,825/319
163T	16"	3	117	2,400	8,030/665
164	16"	4	120	2,400	5,100/425
164T	16"	4	120	2,400	10,710/890
165	16"	5	123	2,400	6,375/531
165T	16"	5	123	2,400	13,385/1,115
166	16"	6	126	2,400	7,650/638
166T	16"	6	126	2,400	16,065/1,335
167	16"	7	129	2,400	8,926/744
167T	16"	7	129	2,400	18,745/1,560
168	16"	8	132	2,400	10,200/850
168T	16"	8	132	2,400	21,420/1,785

"T" Designates high coefficient friction material. Available as an option upon request.

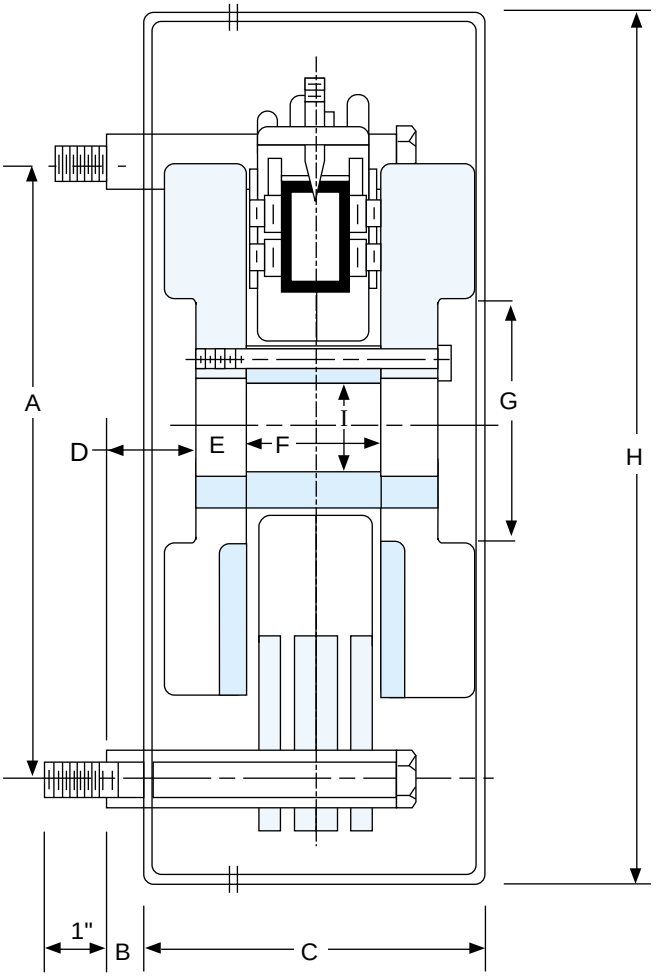
Torque characteristics



Note: Torque is proportional to air pressure as shown above.

C

EP – Extra Performance



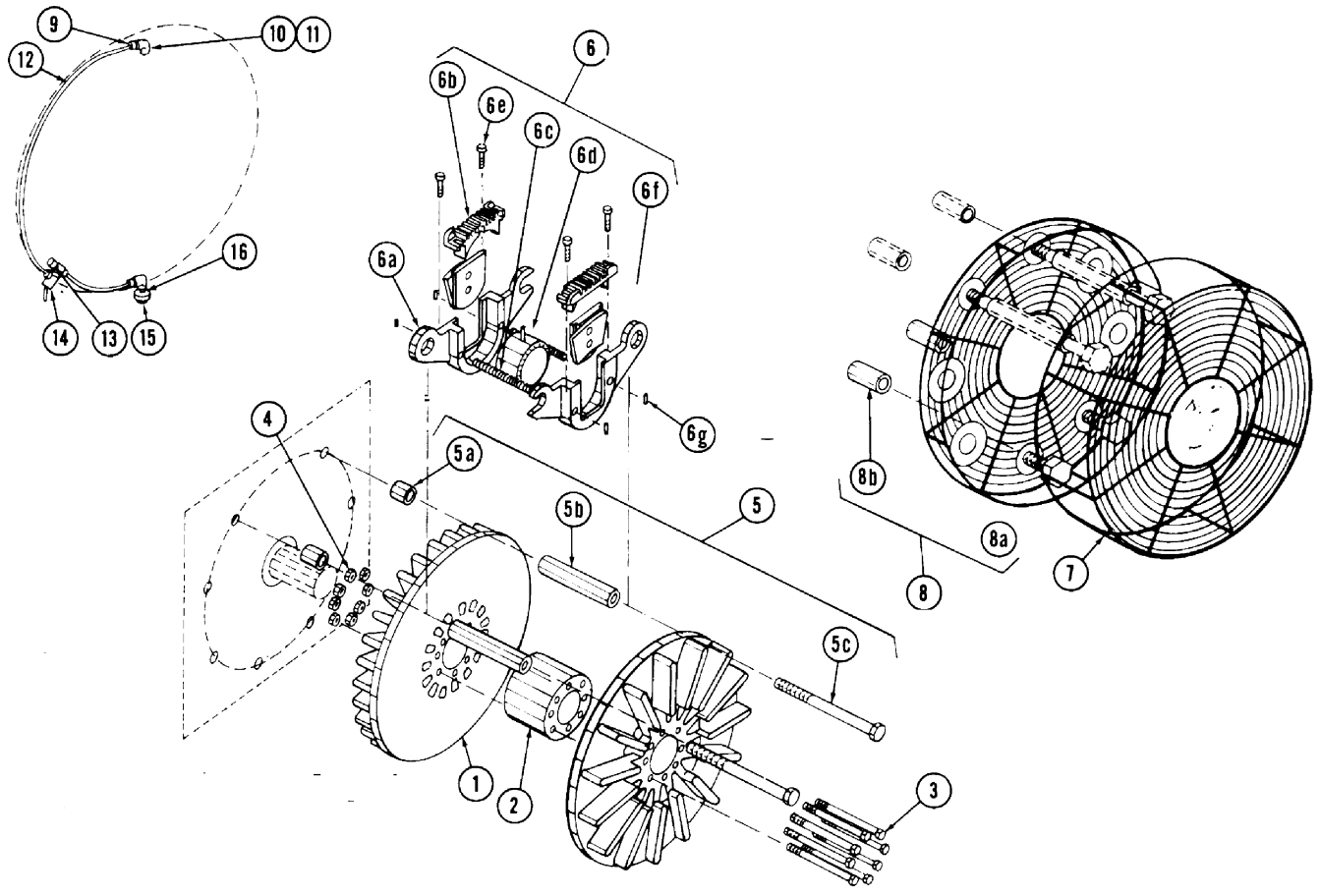
J = Size of Mounting Bolts
K = Number of Mounting Bolts

Dimensions

Model No.	A	B	C	D	E	F	G	H	Max Bore Rect Key I Max.	I Min.	J	K	L
101-105	13.00	.75	6.25	1.59	.88	2.72	6.0	16.00	1.875	1.0	5/8"-11	5	7.75
131-136	14.75	.75	6.25	1.59	.88	2.72	8.0	18.00	3.000	1.0	5/8"-11	6	7.75
161-168	17.50	1.25	6.25	2.09	.88	2.72	10.5	21.50	4.500	1.0	5/8"-11	8	8.25

Prior to final layout, contact Wichita for drawings.

Component Parts



1. Friction Plate
2. Hub
3. HHCS 3/8 x 5"
4. Nut 3/8
5. Bolt/Spacer Kit

5a. Short Spacer
5b. Spacer
5c. HHCS 5/8 x 7"

6. Airtube Carrier Assembly

6a. Airtube Carrier
6b. Airtube Carrier Cap
6c. Spring
6d. Airtube Assembly
6e. SHCS 1/4 x 3/4
6f. Friction Puck Assembly
6g. Spring Pin

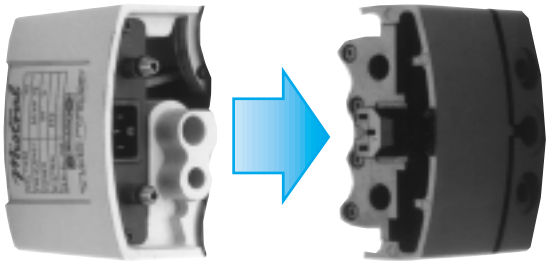
7. Guard
8. Guard Bolt/Spacer Kit

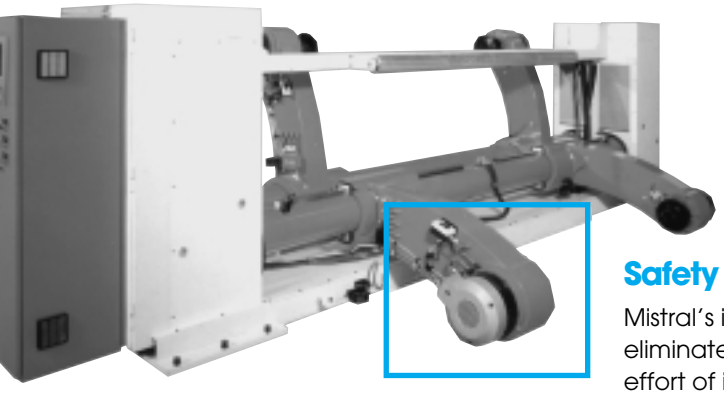
8a. HHCS 5/8 x 2 1/4
8b. Short Spacer

9. Coupling 1/8 x 1/8
10. Elbow 1/8 x 10-32
11. Tee 10-32 x 10-32 x 1/8
12. Teflon Tubing
13. 10-32 Hex Plug
14. 3-Way Switch
15. 10-32 Straight Fitting
16. Washer
17. Extension 1/8

Tension Brakes/Air Cooled

Warner Electric's Wichita Mistral pneumatic tension brake is attuned to the needs of the corrugating market for which it was originally designed. It is also a versatile product which is finding favor in additional tensioning applications. Wichita designers and engineers consulted extensively with mill roll stand manufacturers and users to offer a tension brake ideally suited to the needs of this particular market. The result is a compact, high performance, versatile brake capable of handling the tensioning needs of the latest machine designs, as well as existing equipment. The Mistral paves the way for increasing line speeds by 5.4 feet/sec. from 810 feet/min. (or slower) to 1,140 feet/min.



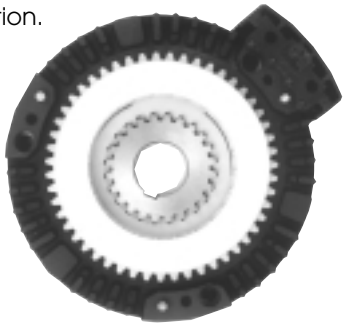


Safety

Mistral's integral guarding eliminates the cost and effort of installing external guards. Operator safety is further enhanced by automatic air and electric disconnects when the front cover is removed.

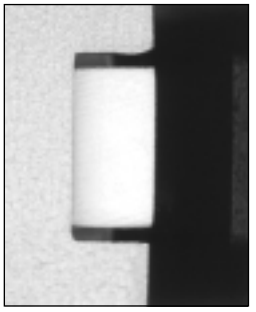
Mounting Ease

Three bolts mount the brake to the arm of the mill roll stand or machine frame and an optional pilot location makes fitting to both new and existing machines a simple operation.



Wear Indicator

A brake wear indicator, which is conveniently located for easy visual inspection, means no down time to check remaining friction material life.



Easy Connection

Air and electrical connections are easily accessible for fast, simple installation and maintenance.

Compact Design, Modern Styling

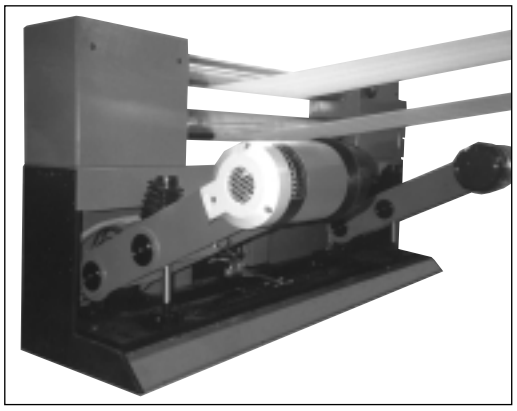
Mistral brakes are compact at only 11.6" or 16.1" in diameter. Their size facilitates the pickup of small, part reels used in short batch runs. For automatic reel loading machines, Mistral offers optional infrared and speed sensor installation within the brake. And their modern, industrial styling enhances the appearance of any machine on which they are used.

Fine Tuning

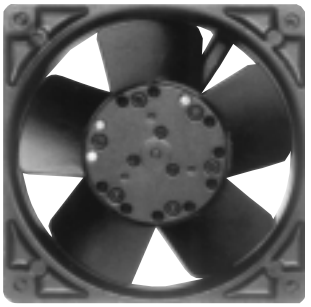
Each brake may be specified with a varying number of pneumatic actuators, allowing precise selection of brake torque capacity for optimum tension control.

Front Cover Removal

By removing just three cap screws, the Mistral's front cover can be detached for easy and fast access to internal parts. Cover removal automatically disconnects both air and electricity.

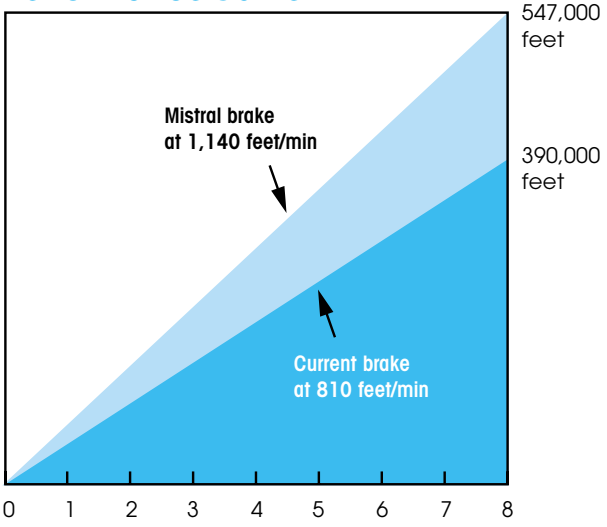


Integral Cooling



A rugged, high performance, low energy usage fan is housed within the brake for high heat dissipation — a must for increased productivity through controlled tension at many roll speeds.

Performance Curve



Fan Data and Connection Data

Model	Fan Voltages	Fan Power	Electric	Pneum.
200	220VAC or/order 110VAC or/order 24VDC	20W	M16 PG9 3/8 NPT	1/8 BSP 1/8 BSP 1/8 NPT
280	220VAC or/order 110VAC or/order 24VDC	18W	M16 PG9 3/8 NPT	1/8 BSP 1/8 BSP 1/8 NPT

Model	Dynamic Slipping Torque Capacity				Heat Transfer Capacity				Maximum Speed	Inertia of Rotating Parts		Weight				Fan Power Rating
	Air Pressure (lb.in.)		(Nm)		Continuous Operation		:30 On/:30 Off Operation			Wr^2	$J=mr^2$	Total Brake		Rotating Parts		
Mistral	min.* 3 psi	max. 80 psi	min.* 0.2 BAR	max. 5.5 BAR	(hp)	(kW)	(hp)	(kW)	(rev./min.)	($lb.ft.^2$)	(kgm^2)	(lb.)	(kg)	(lb.)	(kg)	(W)
200/2/LC	35	1770	4	200	3.2	2.4	3.5	2.6	2860	0.40	0.017	77	35	9.92	4.5	20
200/2	45	2655	5	300	3.2	2.4	3.5	2.6	2860	0.40	0.017	77	35	9.92	4.5	20
200/4/LC	35*	3540	4*	400	3.2	2.4	3.5	2.6	2860	0.40	0.017	77	35	9.92	4.5	20
200/4	45*	5310	5*	600	3.2	2.4	3.5	2.6	2860	0.40	0.017	77	35	9.92	4.5	20
200/6/LC	35*	5310	4*	600	3.2	2.4	3.5	2.6	2860	0.40	0.017	77	35	9.92	4.5	20
200/6	45*	7965	5*	900	3.2	2.4	3.5	2.6	2860	0.40	0.017	77	35	9.92	4.5	20
280/3/LC	45	3540	5	400	6.4	4.8	7	5.2	2090	1.80	0.076	110	50	20.72	9.4	25
280/3	55	5310	6	600	6.4	4.8	7	5.2	2090	1.80	0.076	110	50	20.72	9.4	25
280/6/LC	45*	7080	5*	800	6.4	4.8	7	5.2	2090	1.80	0.076	110	50	20.72	9.4	25
280/6	55*	10620	6*	1200	6.4	4.8	7	5.2	2090	1.80	0.076	110	50	20.72	9.4	25
280/9/LC	45*	10620	5*	1200	6.4	4.8	7	5.2	2090	1.80	0.076	110	50	20.72	9.4	25
280/9	55*	15930	6*	1800	6.4	4.8	7	5.2	2090	1.80	0.076	110	50	20.72	9.4	25

* With only one set of actuators engaged

Mistral Brakes

Selecting a Mistral Brake for a Corrugator Tension – unwind application

To properly select a tension brake for an unwind application the following information is needed.

Application Data

Max. Roll Dia. . . . . 48 in.
Max. Web Width . . . . . 36 in.
Max. Web Speed . . . . . 1200 fpm
Max. Tension . . . . . 2 pli
Shaft Size . . . . . 2 in.
Min. Roll Dia. . . . . 6 in.
Min. Web Width . . . . . 36 in.
Min. Web Speed . . . . . 1000 fpm
Min. Tension . . . . . 1 pli
Air Pressure Available . . . . . 80 psi

Calculations

Using the calculations below, consult Specifications Chart, page 93.

The brake selected for this application is a Mistral 200/2 with $2^{1}/_{4}$ inch bore.

Max. Tension = Max pli x Max. Web Width
= 2 x 36 = 72 lbs.

$$\text{Max. Torque} = \frac{\text{Max. Tension x Max. Roll Dia.}}{2}$$
= 72 x 48/2 = 1,728 lb.in.

$$\text{Max. rpm} = \frac{\text{Max. Web Speed x 3.82}}{\text{Min. Roll Dia.}}$$
= 1,200 x 3.82/6 = 764 rpm

$$\text{Heat H.P.} = \frac{\text{Max. Tension x Max Web Speed}}{33{,}000}$$
$$= \frac{72 \times 1200}{33{,}000} = 2.6 \text{ Heat HP}$$

Min. Tension = Min.pli x Min. Web Width
= 1 x 36 = 36 lbs.

$$\text{Min. Torque} = \frac{\text{Min. Tension x Min. Roll Dia.}}{2}$$
= 36 x 6/2 = 108 lb.in.

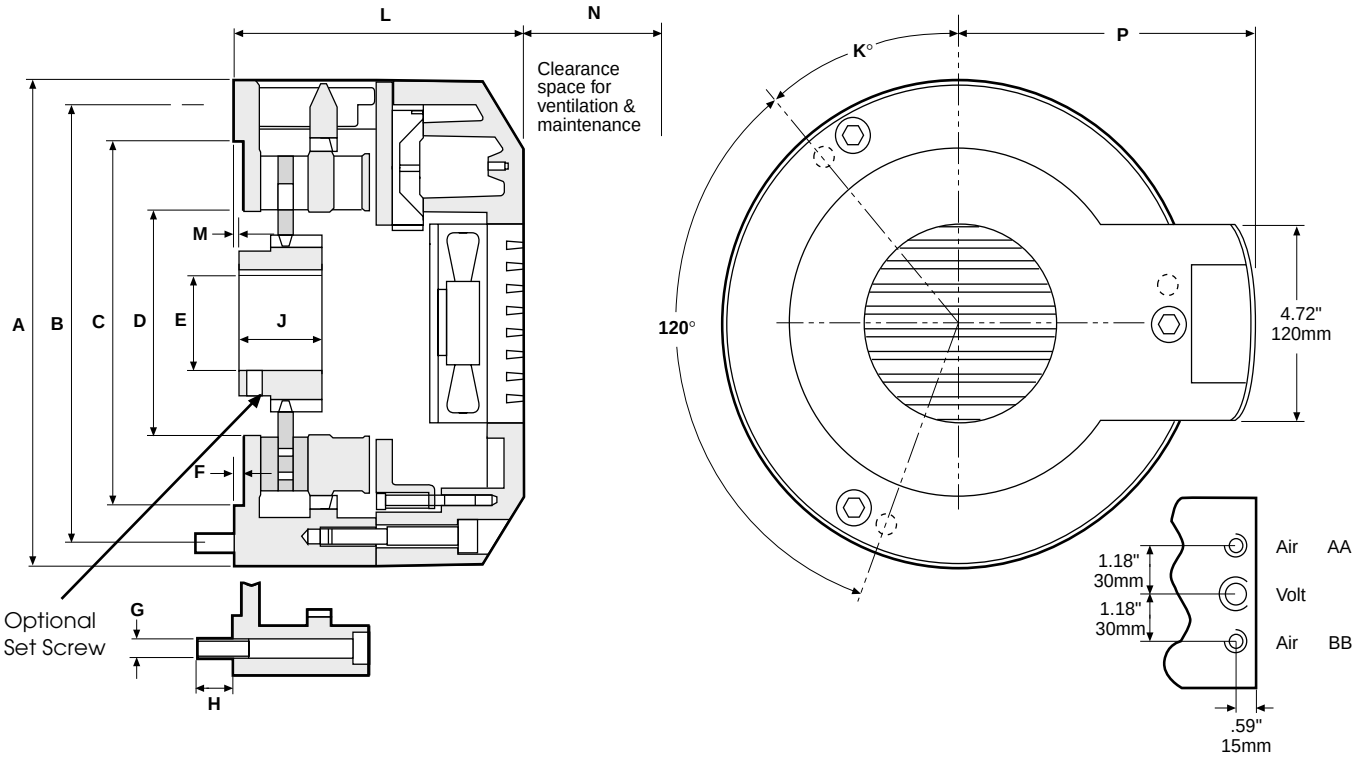
$$\text{Min. rpm} = \frac{\text{Min. Web Speed x 3.82}}{\text{Max. Roll Dia.}}$$
= 1000 x 3.82/48 - 80 rpm

How to Select

1. Check the required torque versus the available actuators' torque capacities. The Mistral 200/2/LC has a torque capacity of 1,180 lb.in. at 80 psi. The torque requirement is 1,728 lb.in. and therefore the Mistral 200/2/LC has insufficient torque capacity. However the 200/2 has sufficient torque capacity.
2. Check thermal requirement. The requirement is 2.6 heat HP. All the Mistral 200's are capable of 3.2 heat HP.
3. Check Maximum Bore. The requirement is 2.00 in. The Mistral 200's maximum bore is 2.25 inches.
4. Check Maximum rpm. The requirement is 764 rpm. The maximum rpm for the Mistral 200's is 2,860 rpm.

$$\text{Max. Air Pressure Required} = \frac{\text{Max. Torque x 80 psi}}{\text{Catalog Torque Rating}}$$
= 1,728 x 80/1,770= 78 psi

$$\text{Min. Air Pressure Required} = \frac{\text{Min. Torque x 80 psi}}{\text{Catalog Torque Rating}}$$
$$= \frac{108 \times 80}{1770}$$
= 5 psi



Dimensions (mm)

Model	A	B	F	G	H	J	K	L	M	N	P
		H.C.					DEG				
200	11.61 (295)	10.236 (260)	.24 (6)	1/2 (M12)	.98 (25)	1.97 (50)	40° (40°)	7.01 (178)	N/A (N/A)	2.76 (70)	7.19 (182.5)
280	16.14 (410)	13.976 (355)	0 0	5/8 (M16)	1.18 (30)	2.36 (60)	20° (20°)	7.56 (192)	0.37 (9.5)	3.15 (80)	9.47 (240.5)

Pilot Mounting Dimensions "C" and "D" (mm)

Model	Mounting Pilot	Mounting Bolts Qty. and Size
200	Dim. "C" 8.661 +.003/-.000 (220 +.08/-.00)	3 @ 1/2 - 13 UNC (3 @ M12 x 1-3/4)
280	Dim. "D" 6.890 +.003/-.000 (175 +.08/-.00)	3 @ 5/8 - 11 UNC (3 @ M16 x 2)

Actuator/Inlet

Model	No. of Actuators	No. of Air Inlets	No. of Actuators Per Air Inlets AA	BB
200/2	2	2	2	0
200/4	4	2	2	2
200/6	6	2	2	4
280/3	3	2	3	0
280/6	6	2	3	3
280/9	9	2	3	6

Bore and Keyway Dimension "E" (mm)

Model	Minimum Bore (No Keyway)	Maximum Bore with Keyway	
200	1.00 (25)	2 3/8 (60)	5/8 x 7/32 (18 x 4.4)
280	1.00 (25)	2 5/8 (65)	3/4 x 1/4 (18 x 4.4)

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a or ASTM-574M-97a (Metric Version).

Tension Brake Control

Load Cell System Control

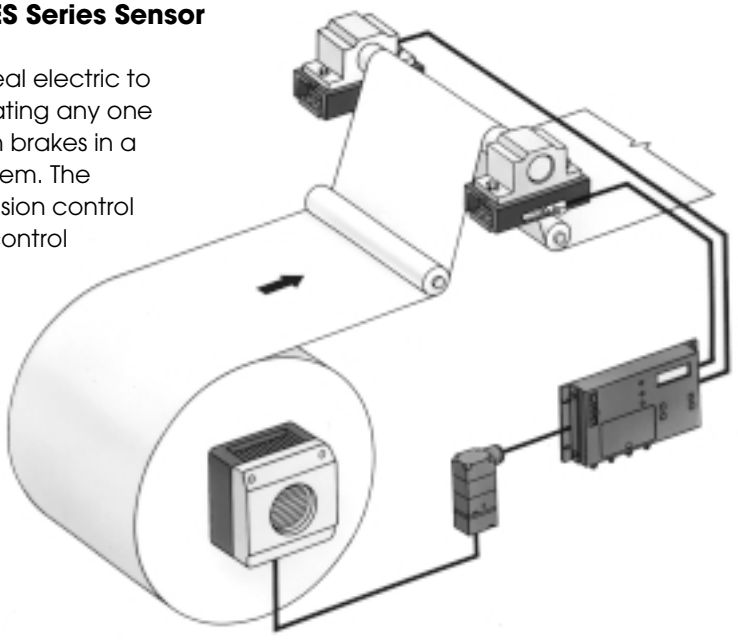
MCS2000-CTLC

FM Series Sensor

ES Series Sensor

The MCS2000-CTLC is the ideal electric to pneumatic control for operating any one of Wichita's family of tension brakes in a load cell tension control system. The MCS2000-CTLC load cell tension control offers reliable, closed loop control for applications including:

- Coating/Laminating
- Unwinds/Rewinds
- Sheeting
- Printing
- Splicing
- Slitting



Typical Load Cell Tension System Configuration

The system consists of a self contained, easy-to-operate control, E-P transducer precision foot mount load cells (used with pillow blocks), cables, and one or more of a variety of Wichita tension brakes and/or clutches. Wichita's tension brake options include the EP, Magnum, Mistral, Kopper-Kool, Low Inertia, and Standard Vent families.

Consideration

Load cell vs. dancer

Deciding between a load cell and a dancer system requires the consideration of several interrelated factors.

including:

- Space limitations
- Material thickness
- Retrofitting existing equipment

Load cell systems generally take less space and work well with heavier material that cannot wrap around a dancer roll.

If you are uncertain about which approach is best for your application, please consult your Wichita representative.

Specifications

FM Series Foot Mounted Load Cells

Load Ratings	**N**	100	250	500	1,000	2,500	5,000
	(lbs.)	(22)	(56)	(225)	(562)	(1,124)	(2,248)
Size		01	01	01	01	01	01

Input Power ±12 to ±15 VDC, ±5%
Output Signal 5 VDC factory setting at nominal load (can be rescaled for 25% load at +10 VDC output)
Ambient Temperature 0–70°C (F)
Temperature Drift 0.1% of rating per °C
Non-Linearity & Repeatability <0.5%
Power Consumption 1 watt
Cable 9 ft. provided with load cell.

FM Series Part Numbers

FM 01 – 1000 – AC
Model | Size | Load in N | Amplifier built in

ES Series End Shaft Mounted Load Cells

A10 requires a power supply/amplifier
Load Ratings 60 lbs., 170 lbs., 500 lbs.
Input Power 15 Vrms @ 5 KHz
Output Signal 3.2 volts AC/inch displacement/volt excitation
Output Impedance 780 ohms ±30%
Ambient Temperature –60° to +250°F (–50° to +620°C)
Temperature Drift 0.02%
Linearity & Repeatability 0.1% of full scale
Overload Protection 10 times maximum rated load of unit
Cable Two 30 ft. cables provided with load cells.

ES A10 Series Part Numbers
* See below for shaft diameters

AC 10 A12 S _
Model | Load Rating | Shaft dia.* | Shaft Mounting Configurations

ES AC10 Series Load Ratings
A 60 lbs.
B 170 lbs.
C 500 lbs.

PSAC10 Power Supply/Amplifier

Input Power 115/230 VAC, 50–60 Hz
Output Signal –10 to +10 VDC scaleable
Ambient Temperature 32°F to +160°F (0°C to +70°C)
Maximum cable distance between load cell and power supply board 100 feet
Part Number PSAC10 (For a 10 x 8 x 4 Housing add –H)

Shaft Mounting Configurations
W1= split bushing
W2= solid bushing
S= system which includes one W1 load cell, one W2 load cell, two 30 ft. cables and a power supply (PSAC10)

*A30, C30

Load Ratings **A30** 20 lbs., 50 lbs., 90 lbs.
C30 20 lbs., 50 lbs., 90 lbs., 200 lbs., 500 lbs
Input Power 24 VDC at .040 amps (12 to 30 VDC acceptable, with LVDT output proportional)
Output Signal 3 VDC/unit
Ambient Temperature –60° to +250°F (–50° to +120°C)
Overload Protection 10 times rated load range

Note: Tension cells are factory adjusted to provide an offset voltage with no load applied (no deflection). Using an input of 24 volts DC, the LVDT is set to provide an output of 3.5 volts into a resistive load of not less than 100,000 ohms. The voltage resulting from the maximum rated load then adds to or subtracts from the 3.5 volt offset. This results in an output of 6.5 volts in Compression.

ES A30 and C30 Series Part Numbers

BA30 12 KS _ - 25
Shaft Mounting Configurations

Shaft Mounting Configurations
W1= split bushing
W2= solid bushing
S= system which includes one W1 load cell and one W2 load cell
* C30 only

Shaft Diameter

inches	3/4	1	1-1/4	1-7/16
code	12	16	20	23

- Other diameters are available

* Other ratings and styles are available

D

Load Cell Selection

The following steps should be followed to determine the proper load cell size and style for your application.

1. Determine whether you will be using one or two load cells.

It is best for two sensing heads to be used, one at each end of the sensing roll. The two individual web tension inputs are averaged in the controller, which takes care of non-central alignment of the web over the sensing roll and slack edges from a non-uniform reel. The AC10 and C30 can only be used in dual load cell applications. The FM Series and A30 can be used in single load cell applications. The A30 is designed to be used with a single pulley or sheave mounting with a projection of 1 or 2 inches. An ES style cantilever unit is also available in lengths to 18". Consult the factory for more information.

2. Choose the load cell model that fits dimensionally.

The FM style is a foot mounted load cell (used with pillow blocks) that mounts perpendicular to the roll being measured. The ES style is an end shaft model where the mounting bolt centerline is on the axis of the measuring roll. There are two shaft mounting configurations with the ES style load cells. The "W1" cell clamps to the shaft while the "W2" cell allows for thermal expansion of the shaft. Both units have self aligning features. When using the dual load cell units (C30 or AC10 series) one of each shaft mounting configuration must be used. It is recommended that a system be ordered in the AC10 or C30 series (ex. AC10A12S) which will insure one "W1" load cell and one "W2" load cell is supplied as a matched pair.

The AC10 is an AC version load cell that is economically priced when compared with the other ES models, even with the added power supply board that is required to power it.

Available sizes and dimensions are listed on pages 100 & 101 for the ES or FM style units. Choose the unit(s) that will best fit the machine construction.

3. Load Cell Force Calculations

The FM style load cell can be mounted regardless of orientation, but has to work in compression. Only the perpendicular force (resultant) is measured by the load cell. The perpendicular force can be at a maximum permitted angle of ±30°. The FM style is a strain gauge load cell and the maximum tension in the web used (T) should be the potential overload force.

The ES style load cells can be mounted at any angle around the axis of the measuring roll with any wrap angle. They work equally well in either tension or compression making it easy to adapt them to any new, retrofit, or replacement application. The mechanical structure and primary conversion element is designed to handle overloads at ten times the rated load range. Therefore, these units don't need to be oversized to provide adequate overload protection.

The following selection information is required to select a load cell:

T = maximum tension in the web (lbs.)

W = weight of the sensing roll (lbs.) acts vertically

X = wrap angle (degrees), 180° max.

Y = angle between resultant force of tension and vertical (degrees)

SF = Safety factor. Use 1 for ES style load cells and 2 for FM style load cells.

RF = Resulting force (lbs.)

4. Choose the load cell rating that is equal to or greater than the force calculation.

5. Choose accessories

a. For ES style load cells choose shaft diameter. Chart is on page 101.

b. For the A30 or C30 models specify cable lengths, 25 or 99 ft.

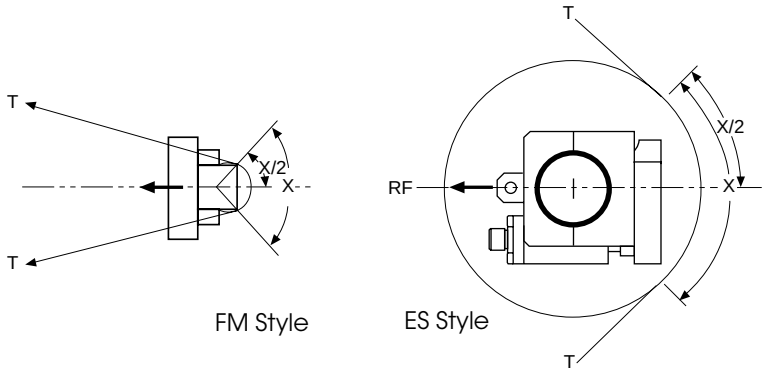
c. For the AC10 model the PSAC10 (power supply and amplifier) is needed. Specify with (-H) or without housing.

Sin/Cos table

Degrees	Sin	Cos
0°	.0000	1.000
5°	.0872	.9962
10°	.1736	.9848
15°	.2588	.9659
20°	.3420	.9397
25°	.4226	.9063
30°	.5000	.8660
35°	.5736	.8192
40°	.6428	.7660
45°	.7071	.7071
50°	.7660	.6428
55°	.8192	.5736
60°	.8660	.5000
65°	.9063	.4226
70°	.9397	.3420
75°	.9659	.2588
80°	.9848	.1736
85°	.9962	.0872
90°	1.000	.0000

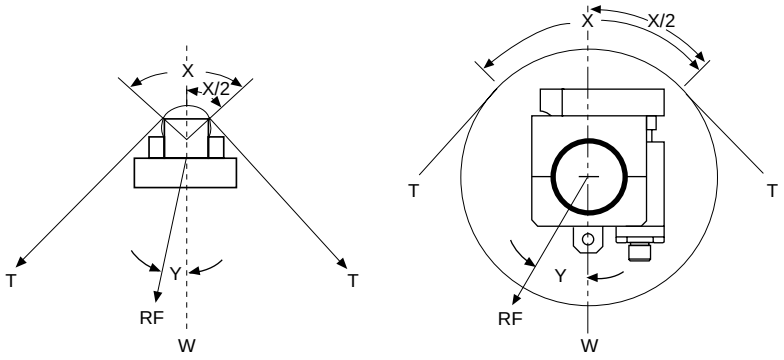
Case 1: Resultant force points horizontal

Load = SF x T(lbs.) x sin (X/2)



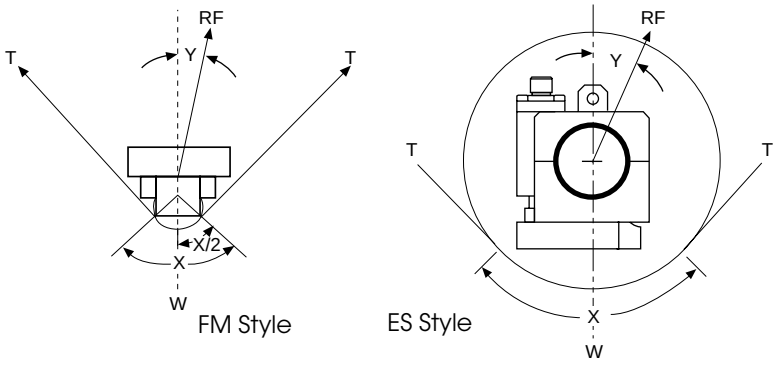
Case 2: Resultant force points down

Load = (SF x T(lbs.) x sin (X/2)) + (W(lbs.) x cos Y)



Case 3: Resultant force points upward

Load = (SF x T(lbs.) x sin (X/2)) – (W(lbs.) x cos Y)

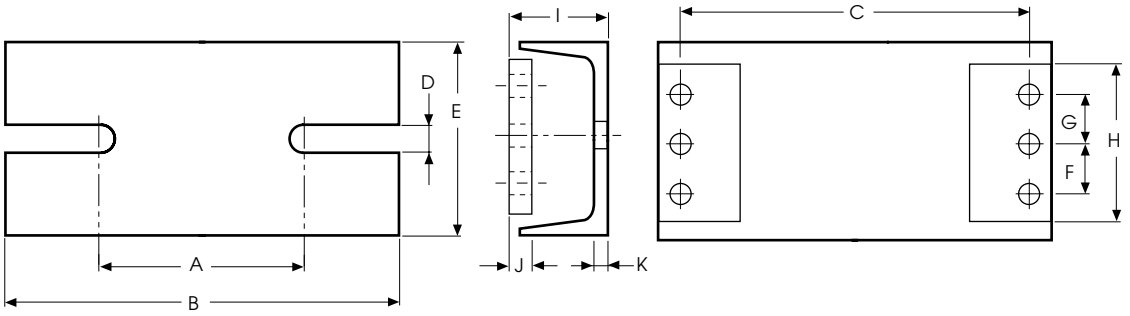


D

Dimensions

FM Series

Foot mounted load cells



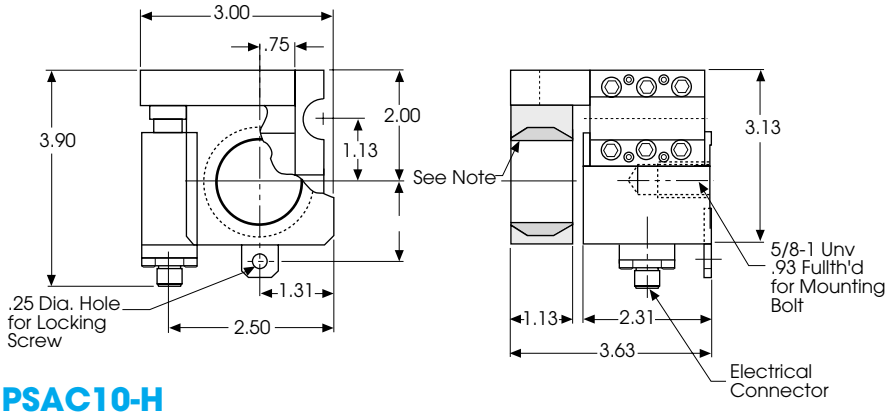
Size	Load Ratings (lbs.)	A	B	C	D	E	F	G	H	I	J	K
01	22 56 225 562 1124 2248	4.055 (103)	7.874 (200)	6.890 (175)	.512 (13)	4.016 (102)	.984 (25)	.984 (25)	3.150 (80)	2.08 (53)	.472 (12)	.222 (6)

ES Series

End shaft mounted load cells

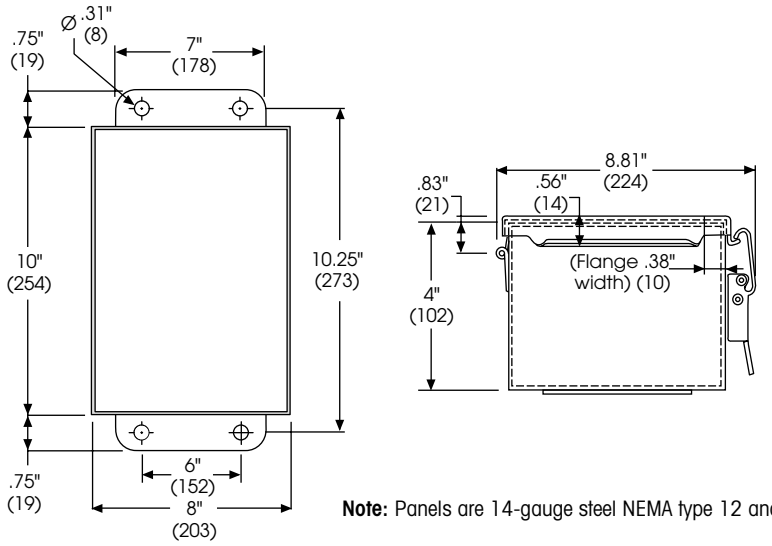
AC10

Dual Load Cell, Non-Rotating Shaft Load ratings 60 lbs., 170 lbs., 500 lbs.



PSAC10-H

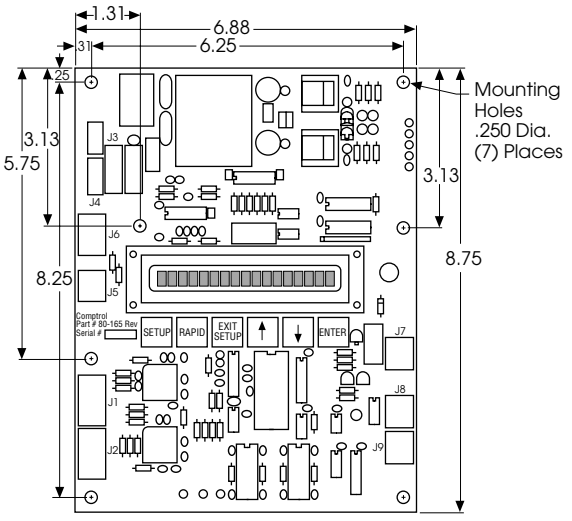
AC10 Power Supply/Amplifier Housing



Note: Panels are 14-gauge steel NEMA type 12 and 13.

PSAC10

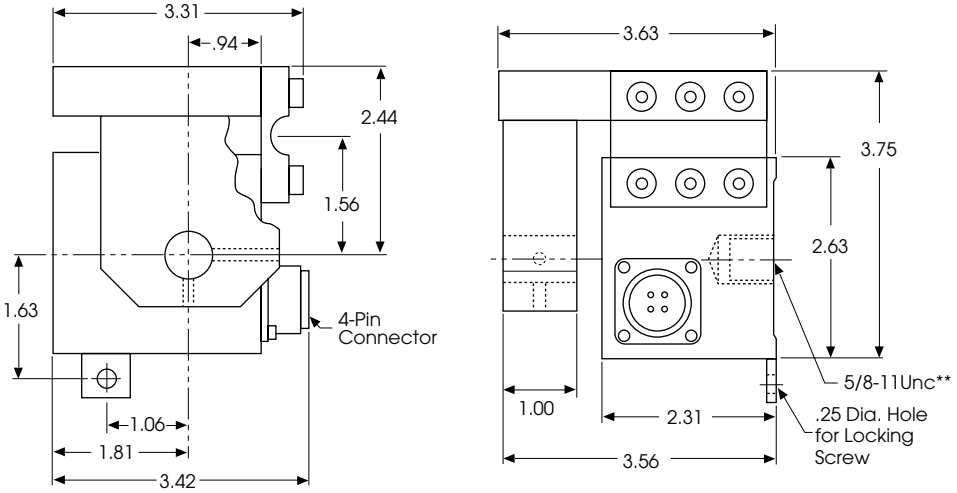
AC10 Power Supply/Amplifier



A30

Single Load Cell, Non-Rotating Shaft

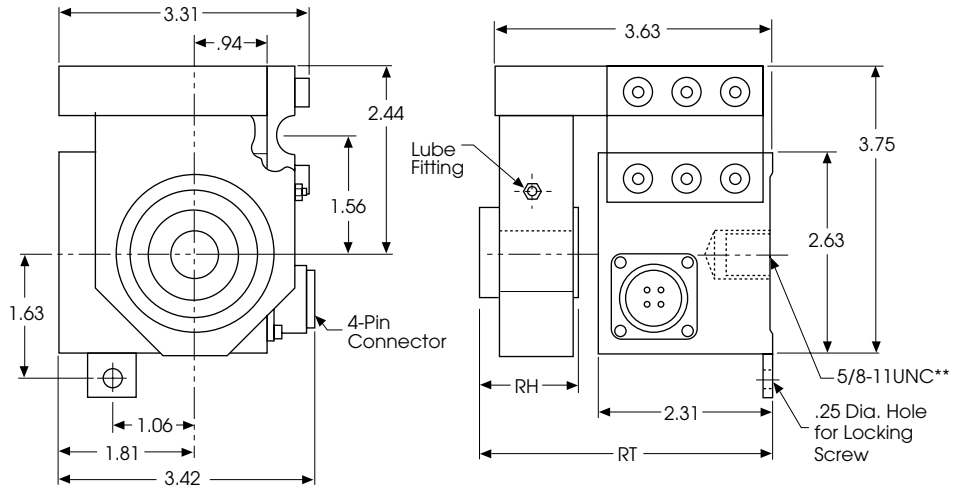
Sheave or pulley mounting with projection of 1 or 2 inches.



Load Ratings: 20 lbs., 50 lbs., 90 lbs.

C30

Dual Load Cell, Rotating Shaft



Load Ratings: 20 lbs., 50 lbs., 90 lbs., 200 lbs., 500 lbs.

RH and RT dimensions based on shaft diameter

Inches	3/4	1.0	1-1/4	1-7/16
Code	12	16	20	23
RH	1.31	1.38	1.69	
RT	3.88		4.13	

D

Tension System Feedback Control

MCS-2000-CTDA
Dancer arm feedback

MCS-2000-CTLC
Load cell system feedback control

Both units have especially beendesigned for user applications. They include all functions for web tension control. The units are equipped with standard power supply, controller front face keyboard and display. The CTLC unit is provided with 2 load cells inputs with selectable sensitivity from 10 mV to 10 V, then compatible with all sensors on the market.

Applications

For every web or wire tension control application. Applicable regardless of controlling device (air brake, electric brake or motor).

Common Features

- Scaleable tension read out
- Password protected
- 8 different output options
- Fully digital
- Multi-purpose
- RS232 communication
- Memory card for storing 2 programs
- Windows programming software
- Integral terminal reset
- 2 output channels with full splicing logic
- Automatic sensor scaling
- External set point change
- Programmable output configuration
- Output sensor information
- Automatic or imposed PID correction

MCS2000-Windows

The Windows programming software package is compatible with any PC running under Windows 3.1 or above. The software can be run under two different modes: demo or connected. The demo mode allows software use without being connected to the MCS2000 Programmable Controller. In the connected mode, the PC and the MCS2000 must be connected through the RS232 cable.

Specifications

Input Power/Output Power

Input supply	110-240 VAC, switch selectable
Ref. Output	10 VDC, 10mA max.
Sensor Output	±15 VDC, 100mA max.

Performance

Analog input/output resolution	12-bit ADC/DAC, 4096 steps

Analog Inputs

2 analog inputs	0–10 VDC, can be increased upon request (consult factory)
Sensor input	Range: ±10 VDC, delta min. of 4 VDC

Analog Outputs

2 output channels	0–±10 VDC or 0–20mA software adjustable
Open loop signal output	0–10 VDC, 10mA max.

Digital Inputs
(Activated by connecting the input to ground. Inputs are optically isolated if a separate external 24 VDC supply is used.)

- Set point adjustment
- Signal multiplier
- Open & closed-loop
- Limit output
- Integral reset
- Synchronize ABC input change
- ABC binary inputs
- Inverse sensor polarity

Digital Outputs
2 binary outputs for sensor error indication

Programming Options
Personal computer or PLC through RS232 cable

Display Options
(Can display 2 parameters on any of the programming options listed above.)

Set point	Indicator
Sensor value	Green power LED indicator
Analog 1 input	Red out 1, out 3, and out

window

Analog 2 input	indicators
Output 1	Adjustments
Output 2	

IN# for state of digital inputs

Error sensor 1	Setpoint +
Error sensor 2	Setpoint –
PID adaptation	Stop int.

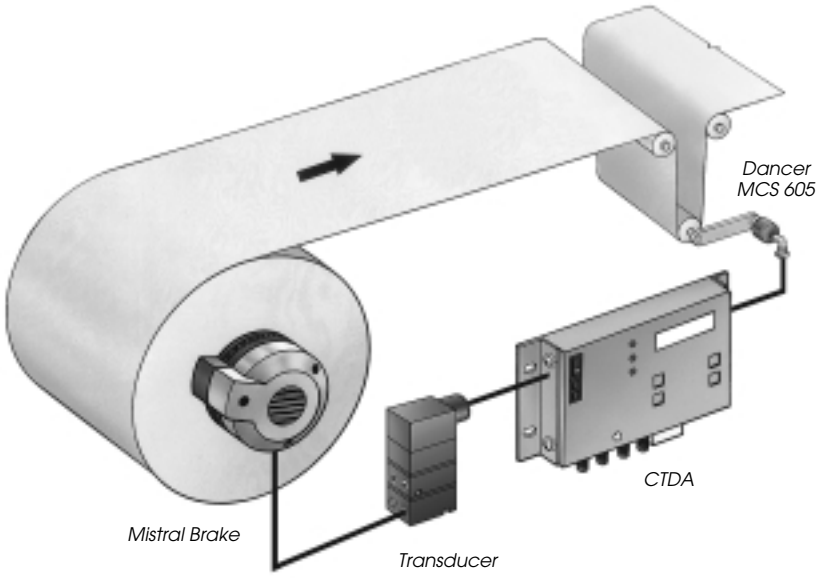
Saving Options	**Switching Inputs**
Contoller stores one full program.	Electro-mechanical, rated 24 VDC
Memory card stores two full progams.	Solid state, rated 40 VDC, minimum

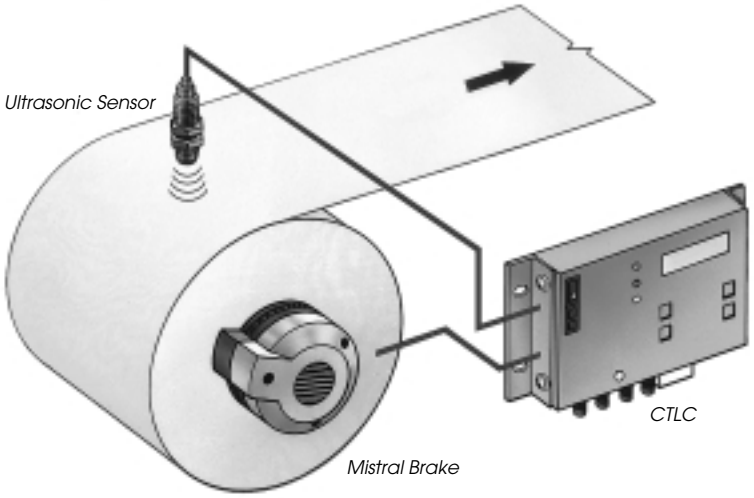
System Configurations

MCS-2000-CTDA
Dancer Arm Control

Tension set at dancer— ie. with air cylinder, dancer position feedback to control adjusts brake to keep dancer in stable, run position, ensuring constant tension.

- Auto scaling of sensor
- Adjustable run window
- Output from dancer position error





Ultrasonic Reading Interface

Continuous diameter measurement adjusts brake torque to maintain constant or taper tension.

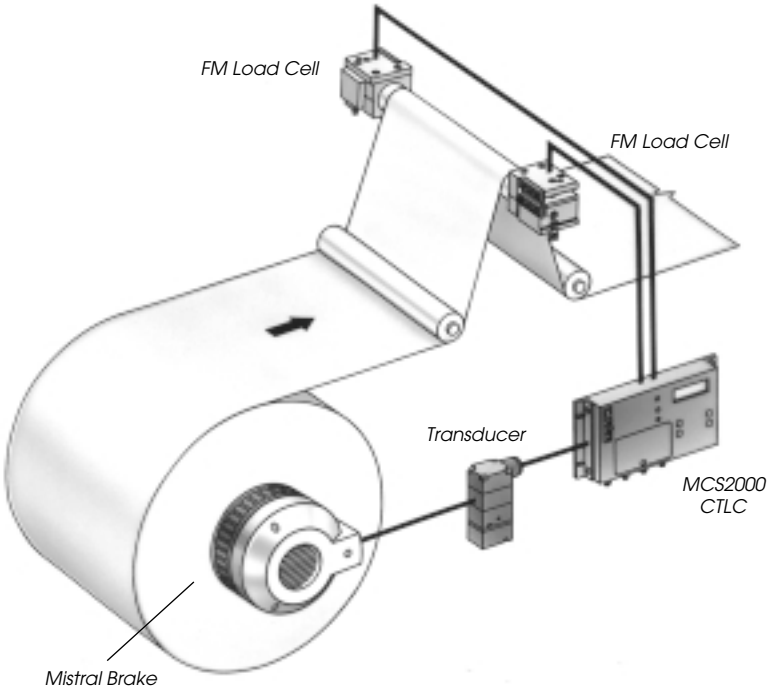
- Full roll & core inputs settable
- Output scaleable
- Constant or taper tension

MCS-2000-CTLC
Load Cell Control

Set point digitally selectable and displayed. Compression of load cell by web tension provides proportional input to control. Output corrects brake torque to maintain set-point.

- Set point and actual tension both displayed
- Amplifier adjustable for any load cell from 20 MV to 10V
- Digital adjustment of set point

Note: For a more detailed listing of control options, see catalog P-771.



MCS2000-IS
Load Cell Interface

The interface sensor will sum and amplify the input signals from two load cells, and can be used with a number of different load cells. The interface should be positioned close to the load cells to ensure that no noise is injected into the low voltage signal before it is amplified.

Specifications

Input Power/Output Power	
Input supply	+24 VDC, ±10%, 300mA
Load cell supply	±15 VDC or ±5 VDC, 100mA max.
Analog Inputs	
2 load cell inputs	Range: Any voltage between 20 mV and 10 VDC, 5K input impedance
Ultrasonic input	Range: 0–10 VDC, delta min. of 1V, 10K input impedance, Maximum gain: 1000
3 inputs for line speed	Range: 0–10 VDC, 10K impedance
Analog Outputs (Short circuit protected)	
Calibrated load cell/ ultrasonic-sensor output	0–10 VDC, 10mA max.
Power for ultrasonic sensor	+24 VDC
Voltage reference	10 VDC, 10mA
Adjustments	
	Select polarity of ultrasonic sensor output, SW1 Select polarity of voltage reference, SW2 Setup min. & max. values for the load cell or ultrasonic input, SW3 Adjust gain of load cell inputs (p1, p2), 450 min., 1000 max. Adjust load cell offset (p3, p4), ±5 V Adjust gain of summed load cell (p5), 1 min., 2 max. Adjust gain on line speed (p6), 0–10 V Adjust offset for ultrasonic input (p7), 2.5 V max. Adjust gain for ultrasonic input (p8), 1 min., 5 max. Adjust gain for selected output (p9), 0.2 min., 1.1 max.
Indicators	
	Green power indicator Green 10-digit display indicates

System Components and Options

Electro-Pneumatic Transducers

Converts electrical input from control to air pressure output to brake. Output is proportional to input, and is scaleable. Packaged complete with air filter for trouble-free operation.

Specifications

Part #6910-101-066

Input signal:	4–20 ma
Output range:	0–120 psig
Supply pressure:	20–150 psig supply pressure must be at least 5 psig above max output to brake
Temperature range::	20 F˚ to 150 F˚
Minimum air consumption:	6.0 (SEFH) @15 psig
Supply pressure effect:	1.5 psig for 25 psig supply change
Pipe size:	-1/4" NPT

Pivot Point Sensors

The Warner Electric pivot point sensor is a precision electronic positioning device used with dancer systems. Mounted at one end of dancer roll pivot shaft, it provides feedback based upon amplifier displacement change of dancer, as well as rates of change.

Specifications

MCS-605-1 **7330-448-002**

Single turn potentiometer used where range of rotary motion is 60˚

MCS-605-5

5- turn potentiometer used for festooned, or high storage dancers

Ultrasonic Sensors

Provides proportional 4-20ma or 0-10V output based upon distance, or diameter measurement. Minimum and maximum can be sealed. Output from control adjusts brake torque to compensate for diameter change.

For additional details, see catalog P-771.

MCS-2000-CBL Cable

RS232 Cable series as a communication link between the controller and a PC or PLC. Standard length is 10í, which is maximum length recommended for signal integrity.

Programming Software

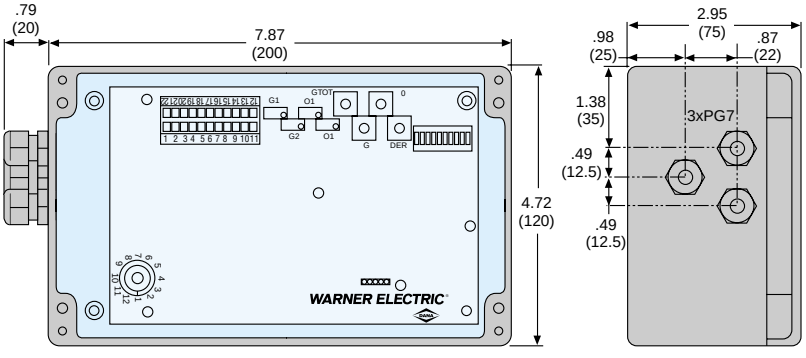
MCS-2000-WIN Programs

Compatible with Windows 3.1 and above. Has demo feature that allows running software without connection to controller. When connected, uses RS232 cable.

MCS-2000-CRD Memory Card

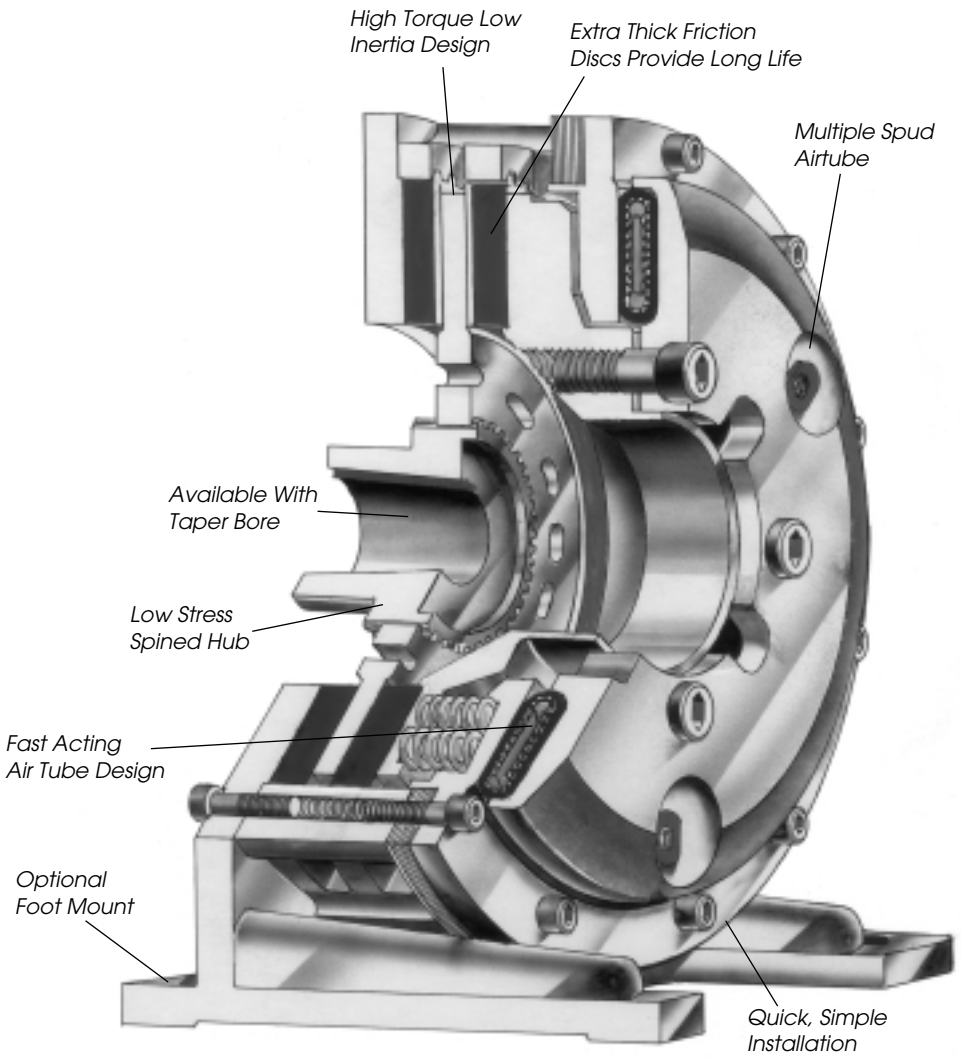
1 9/16î x 9/16î memory card stores 2 full programs, plugs into slot in controller for upload or down load

- Cycling power provides automatic download when card is plugged in
- Protected memory from stray magnetic fields



Motor Brakes

- **Failsafe protection —spring set**
- **Long wear life**
- **Quick, smooth stopping**



Wichita spring set, air release Motor Brakes are ideal for failsafe protection of process equipment. Available in foot mounted and C-face options, this improved design has thicker friction discs for longer wear life. The fast acting Spring-Set actuation assures quick, smooth stops.

Specifications

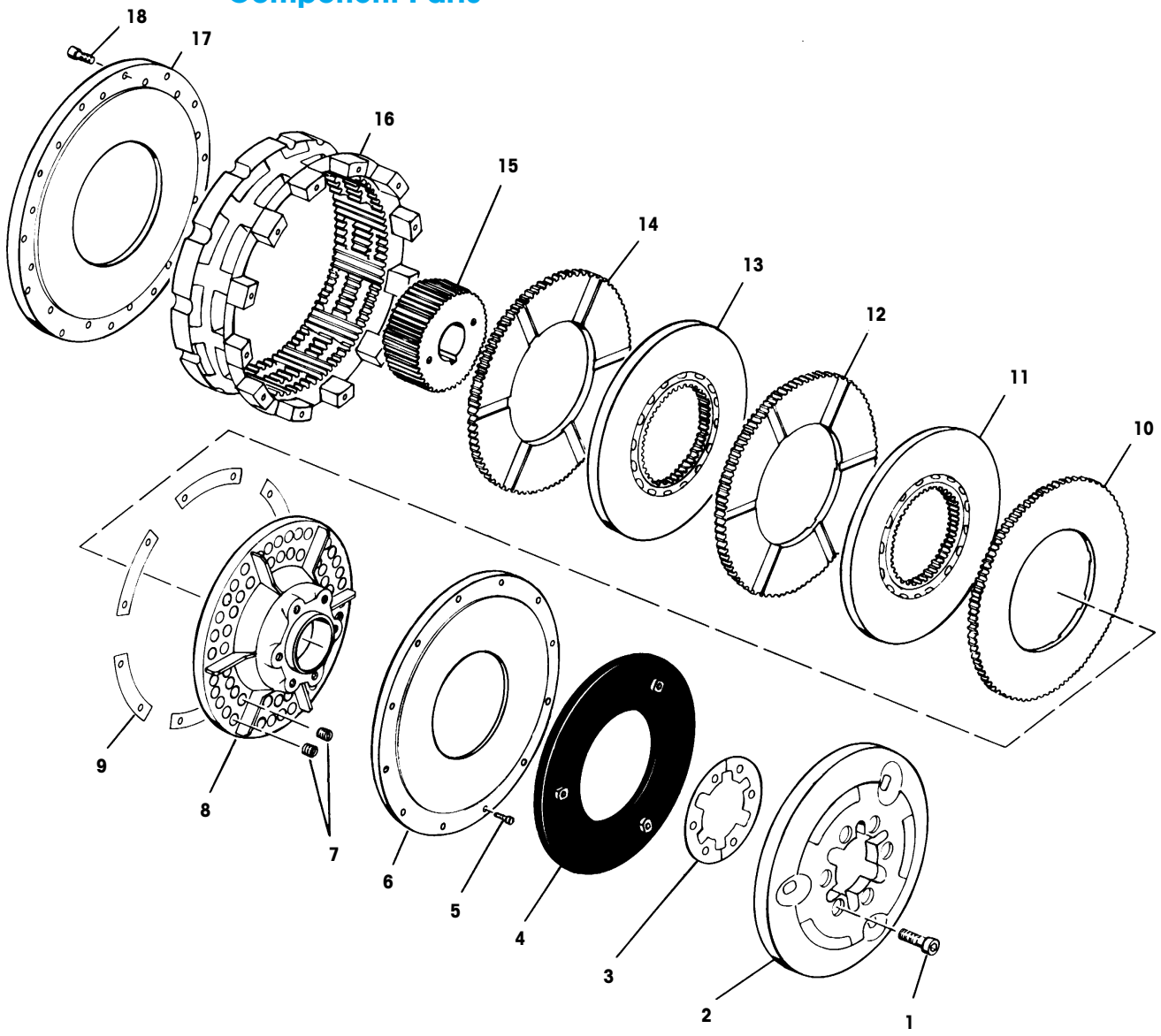
Model No. ATD–	Slip Torque Lb. In. .3 CF* Minimum Air-Tube Pressure PSI For Released Brake 60 (1)	75 (2)	100 (3)	*Do Not Exceed 90% Of Slip Torque Ratings — Maximum Horsepower Per 100 RPM Release Pressure - PSI 60 PSI Duty A	B	C	D	75 PSI Duty A	B	C	D
106 MB	2,225	2,900	3,700	3	2.3	1.2	.6	4	3	1.5	.8
206 MB	4,300	5,600	7,200	6	4.4	2.3	1.1	8	5.7	3	1.5
108 MB	3,700	4,800	6,200	5.3	3.8	2	1	7	5	2.6	1.3
208 MB	7,100	9,100	12,000	10	7.3	3.8	2	13	9.3	5	2.5
111 MB	8,200	10,500	11,600	11.7	8.4	4.4	2.2	15	10.7	5.7	2.8
211 MB	15,600	20,000	26,000	22	16	8.4	4.2	28.6	20.5	11	5.4
114 MB	14,500	18,600	24,700	20	15	8	4	26.6	19	10	5
214 MB	27,600	35,400	46,300	39	28	15	7.5	50	36	19	9.5
118 MB	31,400	40,400	51,600	45	32	17	8.5	58	41	22	11
218 MB	60,000	77,000	100,000	86	61	32	16	110	79	41	21
124H MB	75,500	111,000	128,000	108	77	41	20	158	114	60	30
224H MB	137,000	216,000	242,000	196	140	74	37	308	222	117	58

* Max. recommended air pressure – 130 PSI

Model No. ATD–	100 PSI Duty A	B	C	D	Max. Bore Rect. Key Inches	Total Wt. Lbs.	HUB & CP Wt. Lbs.	HUB & CP WR² #Ft.²	Effec. WR† Lbs.
106 MB	5	3.8	2	1	2	36.5	6.40	.24	14.0
206 MB	10	7.4	3.9	2	2	49.5	12.17	.46	18.34
108 MB	9	6.3	3.3	1.6	2-3/8	63.23	10.0	.55	26.78
208 MB	17	12.3	6.5	3.2	2-3/8	81.5	16.0	.72	32.03
111 MB	16.6	12	6.3	3.1	2-5/8	96.96	15.0	1.35	40.75
211 MB	37	26	14	7	2-5/8	136.0	30.0	2.60	59.05
114 MB	35	25	13	6.7	4-1/8	157.6	38	5.6	72.3
214 MB	66	47	25	12.5	4-1/8	209.6	65	11	95.3
118 MB	74	53	28	14	5-1/4	322	71	14.5	168
218 MB	143	102	54	27	5-1/4	444	113	27.6	215
124H MB	183	131	69	34	7	690	131	50	377
224H MB	346	248	131	65	7	874	260	101	482

† Weight of internal clutch parts for use in calculating clutch engagement time.

Component Parts



1. Socket Head Capscrews
2. Air Tube Holding Plate
3. I.D. Shims
4. Airtube
5. Socket Head Capscrews
6. Airtube Spring Plate
7. Springs
8. Spring Release Plate
9. O. D. Shims
10. Grooved Friction Disc (grooved on one side)
11. Center Plate
12. Grooved Friction Disc (grooved on both sides)
13. Center Plate
14. Grooved Friction Disc (grooved on one side)
15. Hub
16. Ring
17. Backplate
18. Socket Head Capscrews

C-face motor brakes

- No adjustment
- No lubrication
- Low inertia design
- Rugged, dependable design

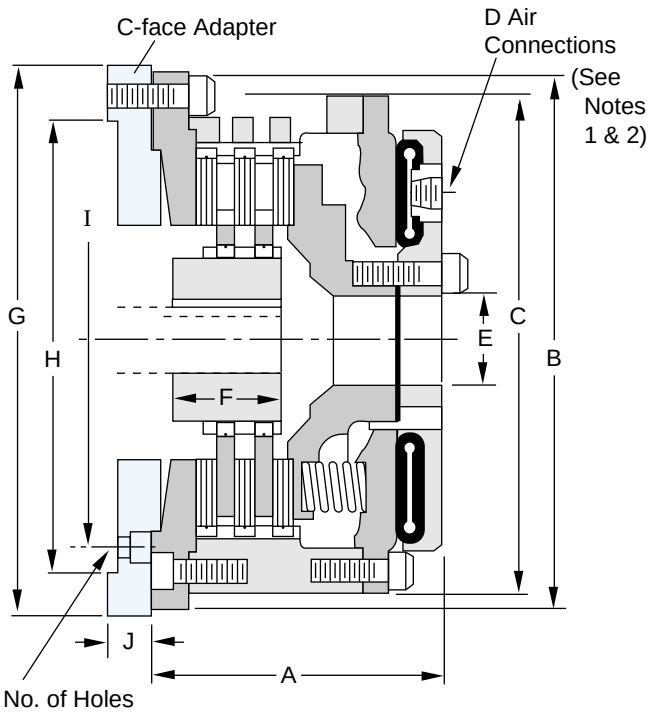
C-face adaptors (shaded blue area) are available in standard NEMA T and U frame designs. Custom adaptors are available for your specific motor design. Dimensions G, H, I, J and number of holes need to be provided to Wichita Engineering before final design is completed.

When using Wichita C-Face Motor Brakes in a high cycling application, brake thermal capacity and motor thermal capacity need to be carefully matched. Wichita C-Face Motor Brakes are ideal when paired with Reliance Motors. The motor information chart lists the specific Wichita part numbers for the proper adapter plate and brake for Reliance Motors up to 200 hp.

Contact Wichita Application Engineering for assistance.

Reliance Motor Information

Frame	Max. HP at Std.RPM	Full Load Motor Torque In. Lb.	Steel Adapter Plate	Model No. ATD–
C210	40 / 2500	1008	4-309-075-011-3	7-108-100-113-0 108 MB
C250	60 / 1750	2161	4-309-075-005-3	7-108-100-113-0 108 MB
C280	100 / 1750	3601	4-281-075-015-3	7-111-100-112-0 111 MB
C320	150 / 1750	5402	4-281-075-016-3	7-111-100-112-0 111 MB
C360	200 / 1750	7202	4-271-075-007-3	7-114-100-113-0 114 MB



Dimensions (in) (Consult factory for drawing before final layout.)

Model No. ATD–	A	B	C	D	No. of Spuds	E	F
106 MB	5.44	8.75	8.81	1/4" NPT	2	2.00	2.00
206 MB	6.75	8.75	8.81	1/4" NPT	2	2.00	3.25
108 MB	5.82	12.12	11.13	1/2" NPT	2	2.13	1.50
208 MB	7.00	12.12	11.13	1/2" NPT	2	2.13	2.87
111 MB	6.38	16.00	14.75	1/2" NPT	2	3.02	2.00
211 MB	7.75	16.00	14.75	1/2" NPT	2	3.02	3.75
114 MB	7.75	18.75	17.50	1/2" NPT	2	3.88	2.25
214 MB	9.69	18.75	17.50	1/2" NPT	2	3.88	4.25
118 MB	9.01	23.25	22.00	1/2" NPT	3	4.75	2.75
218 MB	10.69	23.25	22.00	1/2" NPT	3	4..75	4.75
124H MB	9.26	30.00	29.00	1/2 NPT	3	8.25	3.13
224H MB	11.94	30.00	29.00	1/2" NPT	3	8.25	5.13

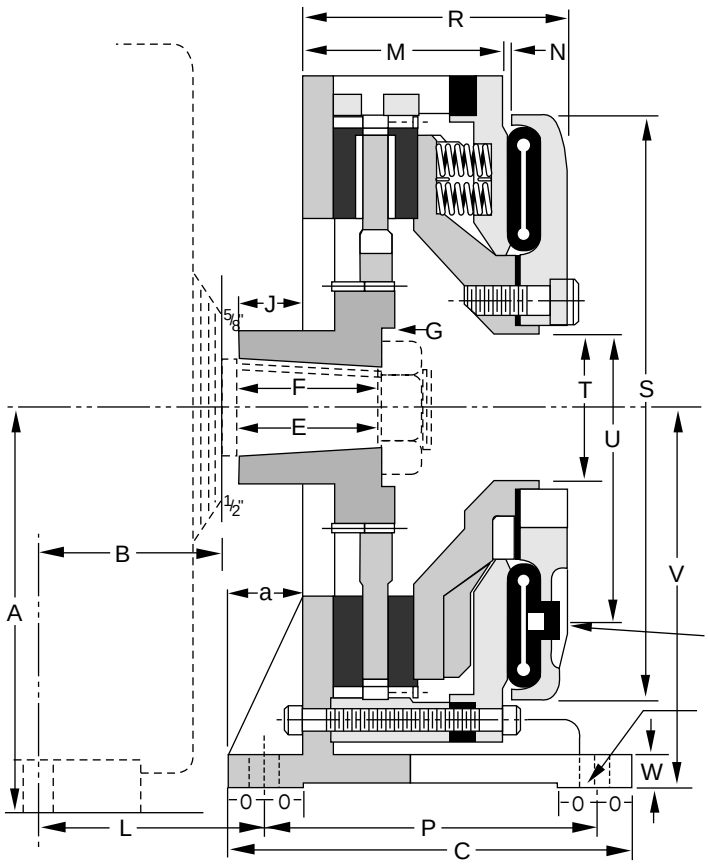
Wichita motor brakes typically produce more torque than is usually necessary. Contact Wichita engineering for help in selecting the number of springs to produce the proper deceleration for your application.

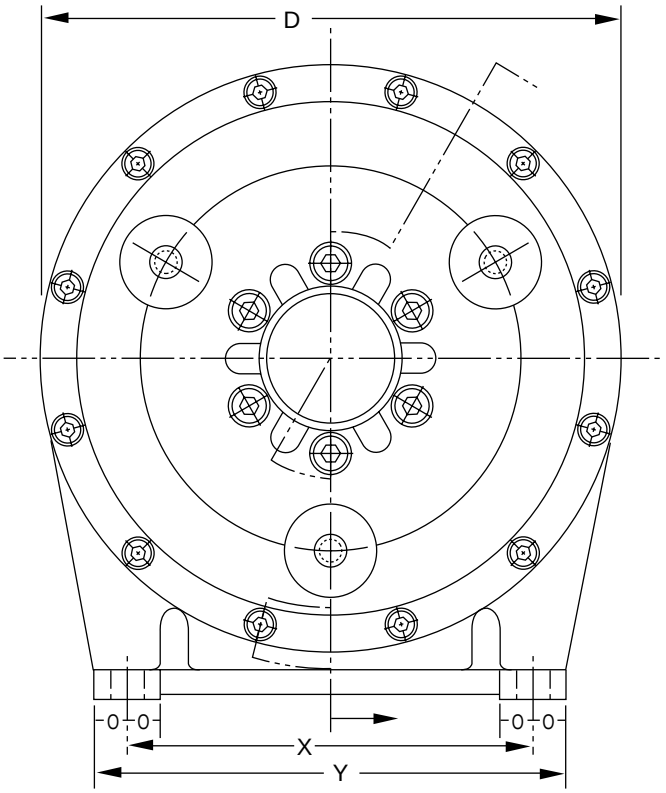
Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

Notes:

1. Quick Release Valves, see page 113.
2. Air Hose Kits, see page 112.

Foot mounted motor brakes





Notes:

1. Quick Release Valves, see page 113.
2. Air Hose Kits, see page 112.

Dimensions (in) (Consult factory for drawing before final layout.)

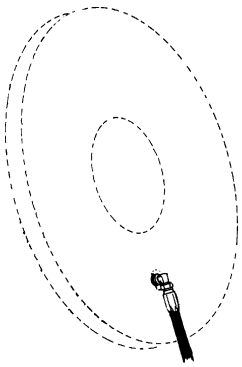
Motor Frame	Model No. ATD–	A	B	C	D	E	F ±.015	G	H	J	K	L	M
602	108 MB	7-5/8	3-3/4	7-1/2	11-1/8	2-3/4	2.875	3/4	2	1-3/4	4	5-3/8	4-3/4
	208 MB	7-5/8	3-3/4	7-1/2	11-1/8	2-3/4	2.875	1-5/8	2	1-3/4	4	5-3/8	5/16
603	111 MB	8-1/2	4-1/2	8	14-3/4	3-1/4	3.312	3/8	2	1-5/8	4	6-1/8	4-9/16
	211 MB	8-1/2	4-1/2	8	14-3/4	3-1/4	3.312	1-3/8	2	1-5/8	4	6-1/8	5-9/16
604	111 MB	9	5	8	14-3/4	3-1/4	3.312	3/8	2	1-5/8	4	6-5/8	4-9/16
	211 MB	9	5	8	14-3/4	3-1/4	3/312	1-3/8	2	1-5/8	4	6-5/8	5-9/16
606	114 MB	10	5	11	17-1/2	4	4.125	1/2	2	1-1/8	4	6	5-7/16
	214 MB	10	5	11	17-1/2	4	4.125	1-7/8	2	1-1/8	4	6	6-13/16
608	114 MB	11-1/4	5-1/8	11	17-1/2	4-1/2	4.625	1/2	2	1-1/2	4	6-1/2	5-7/16
	214 MB	11-1/4	5-1/8	11	17-1/2	4-1/2	4.625	1-7/8	2	1-1/2	4	6-1/2	6-13/16
610	118 MB	12-1/4	5-3/4	13-1/2	22	4-1/2	4.625	1/2	3	3-1/8	4	8-1/4	8-3/32
	218 MB	12-1/4	5-3/4	13-1/2	22	4-1/2	4.625	2-3/16	3	3-1/8	4	8-1/4	9-25/32
612	118 MB	13-3/8	6-1/4	13-1/2	22	4-3/4	4.875	1/2	3	3-1/8	4	8-3/4	8-3/32
	218 MB	13-3/8	6-1/4	13-1/2	22	4-3/4	4.875	2-3/16	3	3-1/8	4	8-3/4	9-25/32
614	124H MB	14-3/4	7-1/4	23-1/4	29	4-3/4	4.875	1/2	3	2-1/8	4	10-1/8	7-3/16
	224H MB	14-3/4	7-1/4	23-1/4	29	4-3/4	4.875	2-1/4	3	2-1/8	4	10-1/8	8-3/4
616	124H MB	16	8-1/2	23-1/4	29	5-1/4	5.375	1/2	3	2-3/4	4	11-3/8	7-3/16
	224H MB	16	8-1/2	23-1/4	29	5-1/4	5.375	2-1/4	3	2-3/4	4	11-3/8	8-3/4
618	124H MB	17-3/4	8	23-1/4	29	5-3/4	5.875	1/2	3	2-1/4	4	10-7/8	7-3/16
	224H MB	17-3/4	8	23-1/4	29	5-3/4	5.875	2-1/4	3	2-1/4	4	10-7/8	8-3/4

Motor Frame	Model No. ATD–	N	O	P	R	S	T	U	V	W	X	Y	Z	a
602	108 MB	5/16	7/8	5-3/4	5-7/8	9-3/8	1.95	6-5/8	7	3/4	3-1/4	8-1/4	11/16	1-5/8
	208 MB	5/16	7/8	5-3/4	6-3/4	9-3/8	1.95	6-5/8	7	3/4	3-1/4	8-1/4	11/16	1-5/8
603	111 MB	5/16	7/8	6-1/4	6	11-15/16	3	8-1/2	8-3/8	3/4	4	9-3/4	11/16	1-1/2
	211 MB	5/16	7/8	6-1/4	7	11-15/16	3	8-1/2	8-3/8	3/4	4	9-3/4	11/16	1-1/2
604	111 MB	5/16	7/8	6-1/4	6	11-15/16	3	8-1/2	8-3/8	3/4	4	9-3/4	11/16	1-1/2
	211 MB	5/16	7/8	6-1/4	7	11-15/16	3	8-1/2	8-3/8	3/4	4	9-3/4	11/16	1-1/2
606	114 MB	9/16	1	9	7-1/2	14-3/8		10-3/4	9-7/8	1	5-3/4	13-1/2	13/16	1-3/4
	214 MB	9/16	1	9	8-7/8	14-3/8		10-3/4	9-7/8	1	5-3/4	13-1/2	13/16	1-3/4
608	114 MB	9/16	1	9	7-1/2	14-3/8		10-3/4	9-7/8	1	5-3/4	13-1/2	13/16	1-3/4
	214 MB	9/16	1	9	8-7/8	14-3/8		10-3/4	9-7/8	1	5-3/4	13-1/2	13/16	1-3/4
610	118 MB	3/8	1-1/4	11	10-1/2	19-3/8	4-7/8	14-3/16	12-1/2	1	7-3/4	18	15/16	2-1/2
	218 MB	3/8	1-1/4	11	12-3/16	19-3/8	4-7/8	14-3/16	12-1/2	1	7-3/4	18	15/16	2-1/2
612	118 MB	3/8	1-1/4	11	10-1/2	19-3/8	4-7/8	14-3/16	12-1/2	1	7-3/4	18	15/16	2-1/2
	218 MB	3/8	1-1/4	11	12-3/16	19-3/8	4-7/8	14-3/16	12-1/2	1	7-3/4	18	15/16	2-1/2
614	124H MB	3/8	1-5/8	19	9-7/16	27	8-1/4	21	20-3/4	2	15	33-1/4	1-9/16	2-5/8
	224H MB	3/8	1-5/8	19	11-1/8	27	8-1/4	21	20-3/4	2	15	33-1/4	1-9/16	2-5/8
616	124H MB	3/8	1-5/8	19	9-7/16	27	8-1/4	21	20-3/4	2	15	33-1/4	1-9/16	2-5/8
	224H MB	3/8	1-5/8	19	11-1/8	27	8-1/4	21	20-3/4	2	15	33-1/4	1-9/16	2-5/8
618	124H MB	3/.8	1-5/8	19	9-7/16	27	8-1/4	21	20-3/4	2	15	33-1/4	1-9/16	2-5/8
	224H MB	3/8	1-5/8	19	11-1/8	27	8-1/4	21	20-3/4	2	15	33-1/4	1-9/16	2-5/8

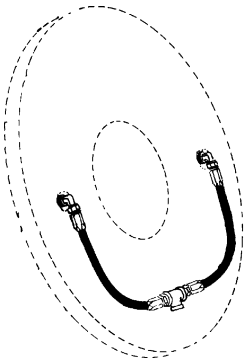
Wichita motor brakes typically produce more torque than is usually necessary. Contact Wichita Engineering for help in selecting the number of springs to produce the proper deceleration for your application.

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

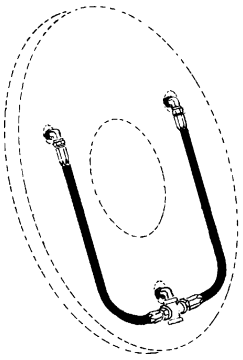
Air Hose Kits



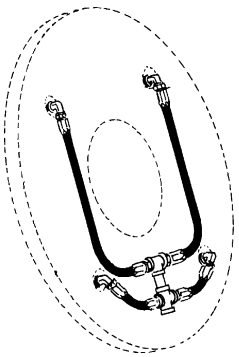
Model	Part Number
8"	8-908-912-100-5 8-908-924-100-5 QRV



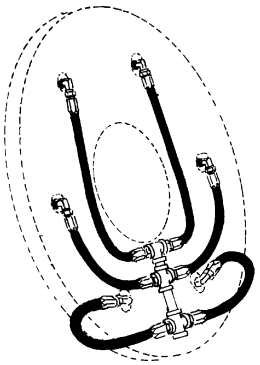
Model	Part Number
6"	8-906-912-200-4 8-906-931-201-5 QRV
8"	8-908-913-200-5 8-908-931-200-5
11"	8-911-913-200-5 8-911-931-200-5 QRV
14"	8-914-913-200-5 8-914-921-200-5 QRV
16"	8-916-913-200-5 8-916-921-200-5 QRV



Model	Part Number
18"	8-918-912-200-5 8-918-931-200-5 QRV
21"	8-921-913-200-5 8-921-931-200-5 QRV
24"	8-924-913-200-5 8-924-931-200-5 QRV
27"	8-927-913-200-5 8-927-921-200-5 QRV



Model	Part Number
30"	8-930-913-400-5 8-930-931-400-5 QRV
36"	8-936-913-400-6 8-936-931-400-6 QRV
42"	8-942-913-400-6 8-924-931-400-6 QRV
48"	8-948-912-400-6 8-948-923-400-6 QRV

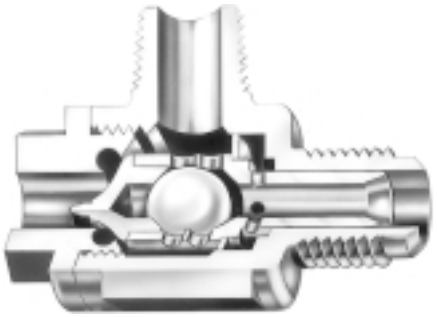


Model	Part Number
60"	8-960-912-500-5 8-960-923-400-6 QRV

Air hose kits contain all necessary parts (fittings, hoses and extensions) to completely plumb the brake air system.

Optional Quick Release Valves can replace elbows on most units (see page 113).

Quick Release Valve



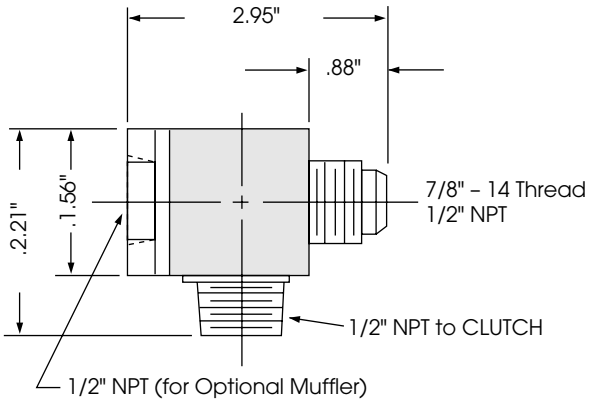
8-263-610-011-1 7/8" – 14 Thread
8-263-610-021-1 1/2" NPT

The Wichita Springless Quick Release Valve discharges twice as fast as any other valve tested in our laboratory and is four to five times faster than some common makes of valves.

This valve will close and seal with less than 20 lbs. pressure. Most others require 25 to 30 lbs. to definitely seal. In actual tests, the Wichita Valve made many hundreds of thousands of engagements and disengagements before the slightest leak occurred, or any parts needed replacement. Other valves which were tested required major replacement in fewer than 20,000 cycles.

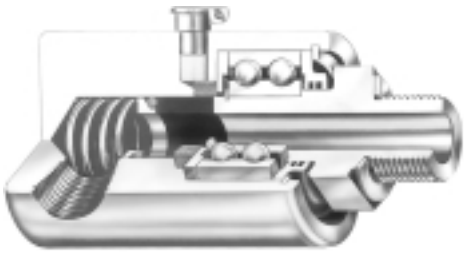
Quality Material

Body and Cap: High strength aluminum alloy
Stem: Moulded nylon
Check Valve: Nylon ball
"O" Ring: Neoprene



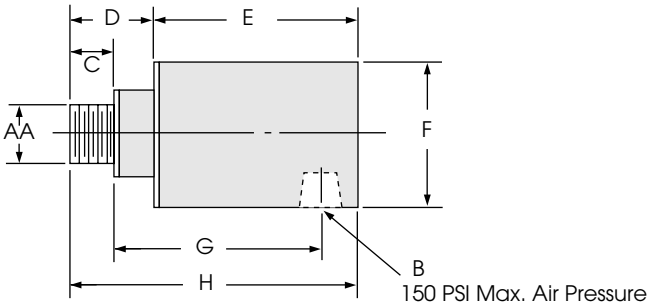
Standard thread arrangement of 1/2" size. 1/2" pipe thread on the tube connection and choice of 1/2" pipe thread, or standard 7/8-14NF thread for flared fitting thread on inlet connection. (Fits standard No. 10 high-pressure hose fitting.)

Roto-couplings



The Wichita Roto-coupling is a device to connect, or couple, a non-rotating air, gas, or fluid line to a rotating shaft.

- Long life, no maintenance.
- Felt seal eliminates bearing contamination.
- Fast, easy installation.



Wichita Part No.	AA	B	C	D	E	F	G	H	Max. R.P.M.
8-240-701-003-1	5/8-18NF	1/4" NPT	.40	1.046	2.250	1.500	2.13	3.297	3500
8-240-705-001-1	1"-14 NF	1/2" NPT	.75	1.250	3.188	2.500	3.00	4.438	3500
8-240-708-001-1	1"-14 NF	3/4" NPT	.75	1.313	4.688	2.875	3.69	5.440	3500
8-240-710-002-1	1-1/2"-12 NF	1" NPT	1.13	1.937	4.875	3.250	3.44	6.812	2500
8-240-712-001-1	2"-12 NF	1-1/2" NPT	1.13	2.813	5.250	4.250	5.38	8.062	2500
8-240-714-001-3	2" NPT	2" NPT	1.50	3.000	7.062	4.625	7.00	10.062	1000
8-240-716-000-3	2-1/2" NPT	2-1/2" NPT	1.88	3.250	9.375	7.000	7.75	12.625	750

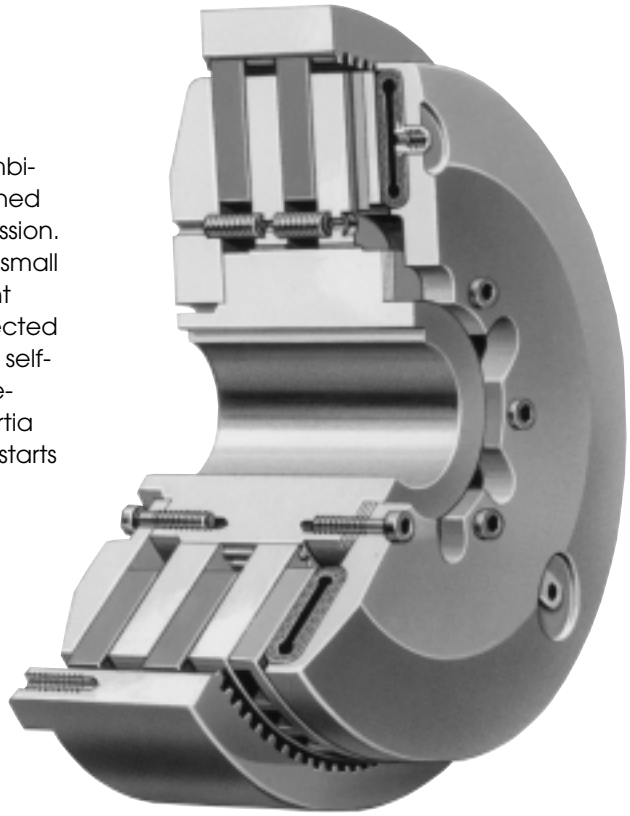
Note: All measurements are in inches.

Standard Vent Clutches

Coupling Clutches

The Wichita Standard Vent Combination Clutch-Coupling is designed for reliable in-line power transmission. The simple air-tube design, with small air volume, speeds engagement and disengagement. It is unaffected by centrifugal force and has no self-energization like drum clutch designs. Ideally suited for large inertia loads where smooth controlled starts are needed.

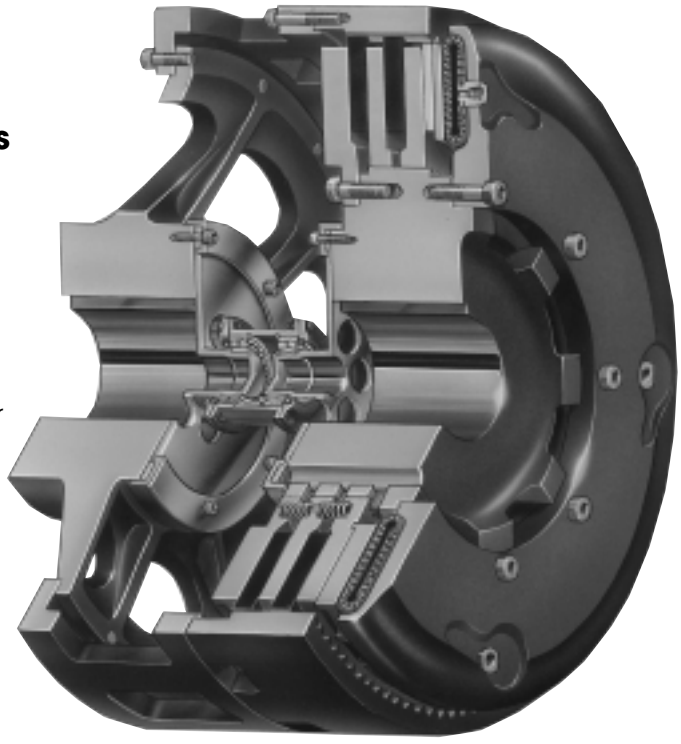
See pages 116 thru 125.



Grinding Mill Clutches

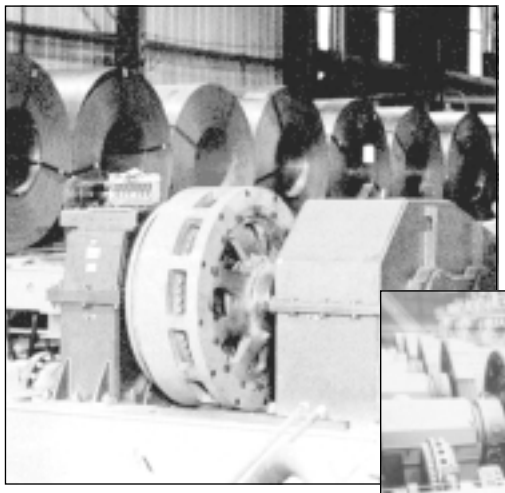
Wichita Grinding Mill Clutches are specially designed to provide quick, smooth starts with limited current surge for heavy duty grinding mills. The clutch is adaptable to remote control allowing centralized operation through simple air or electric circuits.

See pages 126 thru 129.

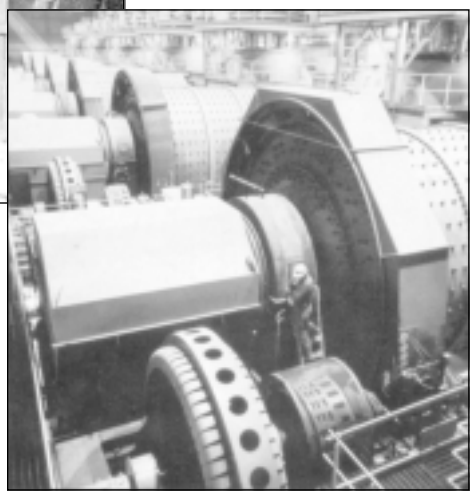


Typical Applications

Reliable, trouble-free Wichita Standard Vent Clutches handle maximum loads on drilling rigs.



Wichita ATD-342 Clutches allow smooth acceleration of coil transporter.



Wichita Grinding Mill Clutches provide shock-free start-up of large inertia loads.

Application Guidelines

Clutch selection is made by knowing the application horsepower/100RPM, the available air pressure, required torque and the clutch heat horsepower. The Requirements Table (Chart A) gives application factors ranging from light duty (the A group) to extra heavy duty (the D group).

Chart A

Field of Application	Group A	Group B	Group C	Group D
Air Movement Pumps		Centrifugal compressors	Reciprocating compressors over 2 cylinders, centrifugal fans & blowers	Reciprocating compressors one or two cylinders
Agitators	Liquid	Semi-solid	Solids	
Brick manufacturing			Brick press, extruder, pug mill	
Can & bottling machine		Bottle-can feeders, filling, mixers		
Engine driven equipment			Crane, hoist, engine	Crowd
Grinding mills			Ball-rod-sag-pebble	Crushers, shakers
Lumber processing		Yarder	Carriages, conveyers	Chipper, logger
Marine		Propulsion clutch CP wheel	Shaft brakes, propulsion reversing type, anchor winch	
Bulk material handling	Conveyors evenly loaded, line shaft evenly loaded	Feeders	Elevators	
Metal production & metalforming		Coilers, slitters, press brake, non-geared press, geared press	Draw bench, rolling mill, shear, back geared press, deep draw press, knucle press	Hammer mill, forming press, forging press, header press
Paper industry dryer sections & calenders consult factory			Fourdrinier to 500 FPM, paper mill plane & smoothing press	Fourdrinier to 1800 RPM press selections, calenders & dryers
Petroleum production		Drilling & service rig master clutches, compound clutches, rotary, drum		Mud pumps, PTO clutches
Rubber manufacturing	Transfer machines evenly loaded		Banberry mixer, drum mixer, extruder, calender	Centrifuge

Coupling and Grinding Mill Clutches

Selection

Clutch sizes are affected by the following variables:

1. Machines that operate under smooth loads require smaller clutches. These machines are driven by either multi-cylinder high speed engines or electric motors with reduced starting current.
2. Drives that require high starting current motors will require clutches with sufficient torque to prevent excessive slipping while starting.
3. Starting torque may be high, which requires fast clutch response time to transmit the required torque or extended clutch slip time to protect the prime mover.
4. Starting torques may be very low compared to the normal torque, which may result in the clutch not being fully pressurized prior to the time of torque requirement. This will cause the clutch to over heat from slippage. Clutch inflation time in this instance is very important.
5. Clutches on most machines are designed to slip prior to damage from shockloads. As a result, the clutch may require periodic maintenance; therefore the clutch should be located, for easy access, in the power train. Clutches should also be located for maximum cooling air. In instances where this is not possible, forced air cooling may be necessary for extended clutch life.
6. Safe operating speeds for clutches should be maintained in design. The following material specifications are recommended for safe operation. The maximum speeds shown are safe operating speeds based upon years of Wichita experience.

Maximum Clutch Contact Velocity FPM	Material
6,000 (Recommended upper limit for slip)	cast iron
9,000	ductile iron
12,000	steel

These velocities are measured at the nominal outside diameter of the clutch plates.

Selection Example

To properly select a clutch for your application, the following information is required:

1. Application horsepower
2. Required air pressure
3. Required torque
4. Clutch heat horsepower
5. Shaft diameter

Chart A (page 115) gives application requirements ranging from light duty (the A group) to extra heavy duty (the D group). This chart will give the initial selection which is then compared with the selection made using the Clutch Heat Horsepower Chart (B) and the Clutch area (see "lining area" column) in the Specification Table (Chart C, page 118-119).

Machine required:

Rock crusher (Grinding mill)
(Group D duty requirement)

WR^2 ..... 1,000 lb.ft.^{2}
rpm 1,800
Clutch Slip Time ..... 6 sec.
hp ..... 325 (diesel 8 cylinder)
Available air pressure .... 120 psi

Clutch must slip while bringing equipment up to speed.

Chart B
Clutch heat horsepower absorption rate*

Slip Time Seconds	Heat Input ft. lb. / in.^{2}	Heat Input hp / in.^{2}
0 to 1	380	.7
2	617	.56
3	820	.5
4	1000	.45
5	1175	.43
6	1330	.4
7	1485	.38
8	1630	.37
9	1770	.36
10	1900	.34

*This chart is for use when clutch is at ambient temperature of 120°F max.

Calculations

Engine torque = $\frac{(hp)\ (63{,}000)}{rpm} = \frac{(325)\ (63{,}000)}{1800}$

Engine torque = 11,375 lb.in.
Clutch torque required while slipping:

Clutch torque = $\frac{(WR^2)\ (rpm)\ (\pi)\ lb.in.}{(g)\ (t_s)\ (2.5)}$

W = Weight to be accelerated lb.
R = Radius of gyration ft.^{2}
g = Acceleration of gravity ft./sec.^{2}
t_s = Time of slip, in seconds
T_C = Clutch torque = 11,707 lb.in.

Engine HP = $\frac{(T_C)\ (input\ rpm)}{63{,}000}$ hp

Clutch heat hp is 1/2 of the total area in the diagram.

Clutch heat hp = $\frac{(T_C)\ (input\ rpm)}{63{,}000}$ (1/2)

Clutch heat HP = $\frac{(11{,}375)\ (1800)}{63{,}000}$ (1/2)

= 162.5 hp

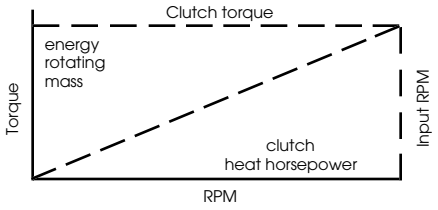
From Clutch Heat Horsepower (Chart B) for a 6 second start:

hp / in.^{2} = .4
Area required = $\frac{162.5}{.4}$ = 406 in.^{2}

To properly select a clutch for this rock crusher application, the following information is required:

1. Application horsepower
2. Required air pressure
3. Required torque
4. Clutch heat horsepower
5. Shaft diameter

The Specification Table on pages 118-119 gives application factors ranging from light duty (the A group) to extra heavy duty (the D group). This chart will give the initial selection which is then compared with the selection made using the Clutch Heat Horsepower Chart and the Clutch Area Chart.



How to select

1. The area required is 406 in. Consult the column head "Lining Area" in Specification Table (pages 118-119). Applicable clutches chosen are: ATD-218, 528 in.^{2}; ATD-124H, 574 in.^{2}; ATD-314H, 504 in.^{2}
2. Determine the application horsepower necessary:
   hp/100 rpm = $\frac{325}{1800}$ (100) hp
   hp/100 = 18hp/100 rpm

Clutches selected with this application horsepower are as follows:

ATD-214H 18hp/100 rpm, ATD-314H 27hp/100 rpm, ATD-118 21hp/100 rpm. The ATD-314 is selected as having both sufficient area and torque with minimum diameter.

Contact velocity = $\frac{(clutch\ size)\ (\pi)\ (1800)}{12}$

= 6597 ft/min

Ductile material required.

Note: This application example is for preliminary sizing only. Contact a Wichita Sales Engineer or the Factory for final selection.

Use engine torque for calculations.
When selecting the proper clutch, heat must be considered. When a clutch is slipped under load, heat is generated within the clutch. This heat as shown to the left is equal to the energy of the mass that was accelerated to speed by the clutch.

In applications where thermal requirements are of concern, consult factory for special ventilated and super ventilated clutch options.

F

Standard Vent Clutches

Coupling and Grinding Mill Clutch Selection

Chart C

Specifications

Model No. ATD–	Slip Torque Lb. In. at 100 PSI .3 CF	Max. Horsepower Per 100 R.P.M. Duty A	B	C	D	Recommended Clearances Inches	Hi-Spd. Airtube Max. Speed RPM	Total Wt. Lb.	Total WR^2 Lb. Ft^2	Driving Ring & Friction Disc WT.	WR^2	Lining Area $In.^2$
108 STVC	7,000	11.1	8	4	2	1/16-1/8	3,000	36	3	8	1.2	56
208 STVC	14,000	22.2	16	8	4	3/32-5/32	3,000	58	38	18	1.8	112
308 STVC	21,000	33.3	24	12	6	3/32-5/32	3,000	80	5.1	28	2.4	168
111 STVC	15,900	25	18	9	5	1/16-1/8	2,800	65	11	20	5	114
211 STVC	31,800	50	37	18	10	3/32-5/32	2,800	106	18	37	10	228
311 STVC	47,700	75	55	27	15	3/32-5/32	2,800	147	25	54	15	342
114H STVC	35,800	56	40	20	9	1/16-1/8	2,200	165	55	38	14	168
214H STVC	71,600	113	80	40	18	3/32-5/32	2,200	220	75	58	24	336
314H STVC	107,400	170	120	60	27	3/32-5/32	2,200	275	85	78	34	504
118 STVC	64,500	102	75	35	21	1/16-1/8	2,000	266	95	47	33	264
218 STVC	129,000	204	150	70	42	3/32-5/32	2,000	390	150	65	63	528
118H STVC	75,000	119	85	40	21	1/16-1/8	1,650	290	103	47	33	264
218H STVC	150,000	238	175	80	42	3/32-5/32	1,650	415	160	65	63	528
318H STVC	225,000	357	260	120	63	1/8-3/16	1,650	540	215	83	153	792
321 STVC	263,000	417	300	150	84	1/8-3/16	1,650	735	360	210	185	1086
124H STVC	153,700	243	180	90	40	3/32-5/32	1,400	580	390	90	100	574
224H STVC	307,400	487	360	180	80	1/8-3/16	1,400	790	535	180	200	1148
324H STVC	461,100	731	540	270	120	5/32-7/32	1,400	1000	680	270	300	1722
327 STVC	517,500	821	600	300	165	5/32-7/32	1,400	1200	945	265	350	2190
230H STVC	654,000	1038	760	380	200	1/8-3/16	1,100	1375	1350	265	460	1664
330H STVC	981,000	1557	1150	570	300	3/16-1/4	1,100	2500	2325	380	570	2496
336H STVC	1,813,500	2418	1800	885	495	3/16-1/4	900	2700	3770	540	1260	3450
342 STVC	2,179,000	3458	2550	1275	705	3/16-1/4	800	3600	7700	1100	3375	4212
248 STVC	2,805,000	4452	3200	1600	915	1/8-3/16	700	4500	11200	785	3130	4020
348 STVC	4,207,500	6678	4800	2400	1370	3/16-1/4	700	5590	13850	1140	4360	6030
260 STVC	5,950,000	9440	6950	3470	1940	3/16-5/16	550	7525	24700	1665	9400	7240
360 STVC	8,925,000	14160	10400	5200	2900	1/4-3/8	550	9350	32250	2500	14020	10850
460 STVC	11,900,000	18880	13900	6940	3880	5/16-7/16	550	12,000	41000	2900	16,615	14,480

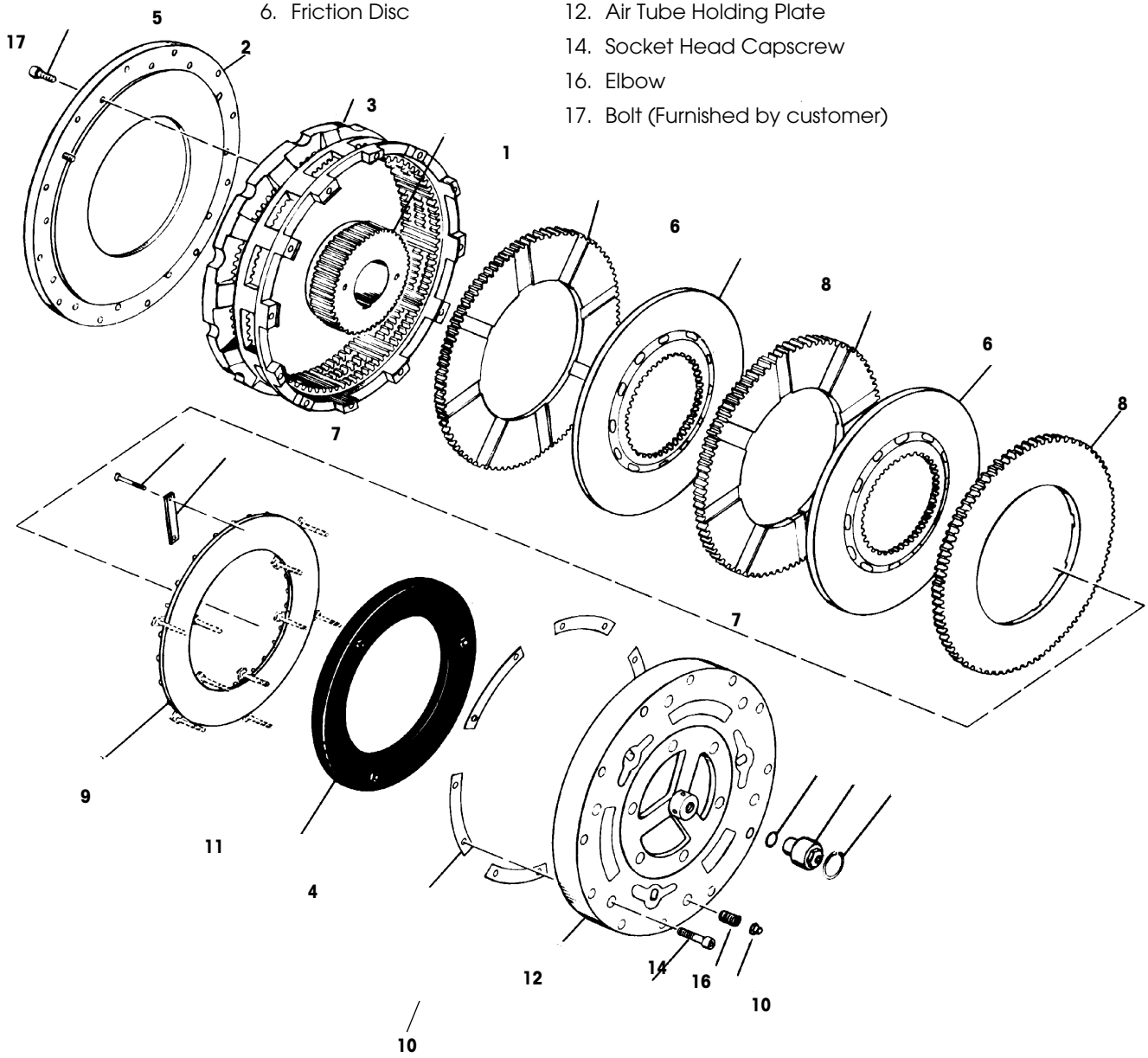
Inflation Coefficient Operating Air Pressure						Exhaust Coefficient Operating Air Pressure								
50 PSI		75 PSI		100 PSI		50 PSI			75 PSI			100 PSI		
K	U	K	U	K	U	R	E	V	R	E	V	R	E	V
15,800	2.2	7,100	2	265	1.2	60	.016	1	525	.02	1.6	240	.02	1.4
15,800	2.2	7,100	2	265	1.2	60	.016	1	525	.02	1.6	240	.02	1.4
15,800	2.2	7,100	2	265	1.2	60	.016	1	525	.02	1.6	240	.02	1.4
890	1.7	880	1.6	5100	2.2	1000	.032	2	8200	.04	2.8	4930	.048	2.8
890	1.7	880	1.6	5100	2.2	1000	.032	2	8200	.04	2.8	4930	.048	2.8
890	1.7	880	1.6	5100	2.2	1000	.032	2	8200	.04	2.8	4930	.048	2.8
456	2	825	2.2	300	1.75	3180	.068	3	8270	.076	3.5	8000	.088	3.7
456	2	825	2.2	300	1.75	3180	.068	3	8270	.076	3.5	8000	.088	3.7
456	2	825	2.2	300	1.75	3180	.068	3	8270	.076	3.5	8000	.088	3.7
9600	3.1	1560	2.4	9600	3.8	44	.068	1.4	40	.072	1.4	34	.08	1.4
9600	3.1	1560	2.4	9600	3.8	44	.068	1.4	40	.072	1.4	34	.08	1.4
1350	2.5	1350	2.5	1350	2.5	113	.052	1.6	36	.064	1.3	630	.076	2.5
1350	2.5	1350	2.5	1350	2.5	113	.052	1.6	36	.064	1.3	630	.076	2.5
1350	2.5	1350	2.5	1350	2.5	113	.052	1.6	36	.064	1.3	630	.076	2.5
1350	2.5	1350	2.5	1350	2.5	71	.07	1.6	26	.077	1.3	490	.084	2.5
145	1.8	90	1.6	87	1.6	360	.096	2.5	240	.112	2.5	270	.136	2.8
145	1.8	90	1.6	87	1.6	360	.096	2.5	240	.112	2.5	270	.136	2.8
145	1.8	90	1.6	87	1.6	360	.096	2.5	240	.112	2.5	270	.136	2.8
145	1.8	90	1.6	87	1.6	360	.096	2.5	240	.112	2.5	270	.136	2.8
185	2	150	2	93	1.8	120	.104	2.1	140	.128	2.4	146	.158	2.7
185	2	150	2	93	1.8	120	.104	2.1	140	.128	2.4	146	.158	2.7
170	2	250	2.2	160	2	124	.112	2.2	92	.128	2.2	76	.152	2.3
115	2	125	2	111	2	132	.12	2.3	89	.144	2.3	6.1	.168	2.3
25	1.6	22	1.6	26	1.8	20	.224	2	20	.256	2.2	19	.308	2.5
25	1.6	22	1.6	26	1.8	20	.224	2	20	.256	2.2	19	.308	2.5
28	1.8	22	1.8	20	1.8	24	264	2.4	10	.304	2.3	9.9	.352	2.2
28	1.8	22	1.8	20	1.8	24	264	2.4	10	.304	2.3	9.9	.352	2.2
28	1.8	22	1.8	20	1.8	24	264	2.4	10	.304	2.3	9.9	.352	2.2

Standard Vent Clutches

Coupling and Grinding Mill Clutches

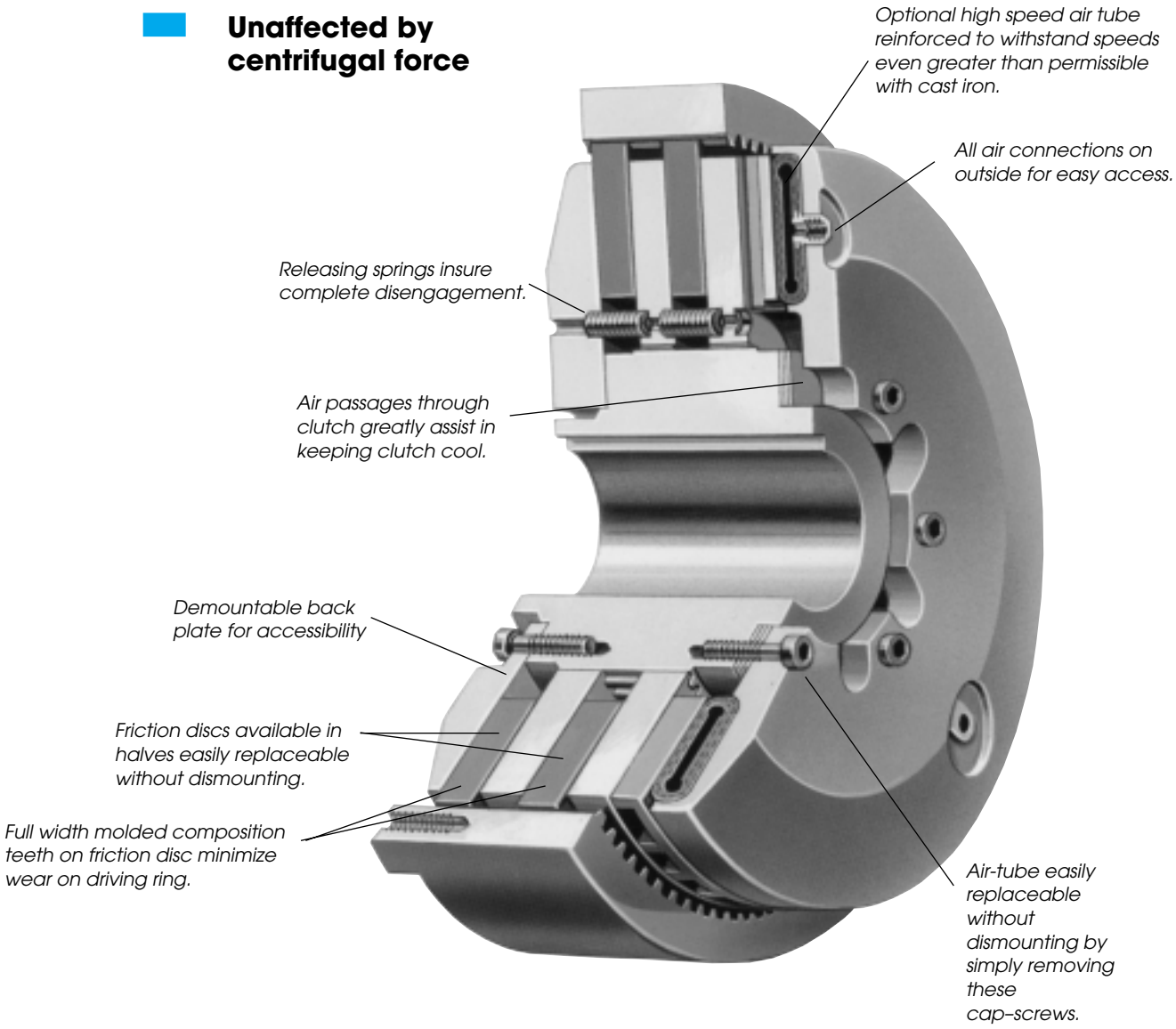
Component Parts

1. Hub
2. Hex Head Bolt
3. Backplate
4. Shim
5. Driving Ring
6. Friction Disc
7. Release Spring
8. Center Plate
9. Pressure Plate
10. Hose Assembly
11. Air Tube
12. Air Tube Holding Plate
14. Socket Head Capscrew
16. Elbow
17. Bolt (Furnished by customer)



Coupling Clutches

- **In-line power applications**
- **Smooth, controlled acceleration**
- **Unaffected by centrifugal force**



The Wichita Standard Vent Combination Clutch-Coupling is designed for reliable in-line power transmission. The simple air-tube design, with small air volume, speeds engagement and disengagement. It is unaffected by centrifugal force and has no self-energization like drum clutch designs. Ideally suited for large inertia loads where smooth controlled starts are needed.

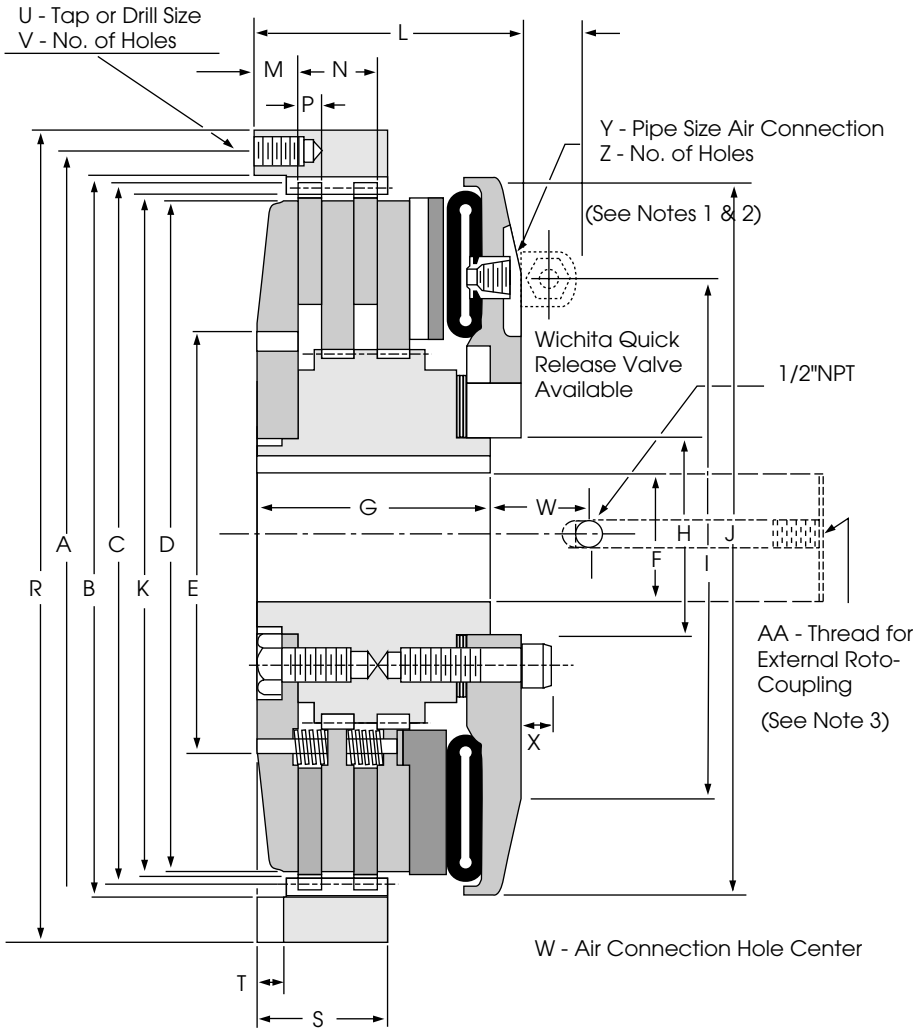
The Wichita air-tube disc design combines all the best features of a disc type clutch with all the advantages of direct air engagement. It is the simplest and most trouble-free method of applying air pressure yet designed.

Problems of speed, smoothness, engagement or disengagement with all types of loads…problems of compactness …problems of simplifying maintenance and many other problems in a wide range of applications are quickly solved with Wichita clutches or brakes.

F

Standard Vent Clutches

Coupling Clutches



Notes:

1. Air Hose Kits, page 130.
2. Quick Release Valves, page 131.
3. Roto-couplings, page 131.

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

Dimensions (in) (Consult factory for drawing before final layout.)

Model No. ATD–	A	+.003" -.000" B	C	D	E	Max Bore Rect. Key F	G	H	I	J
108 STVC	9-5/8	8.873	8-1/2	8	8	1.93	2-3/4	1-15/16	6-5/8	9-5/8
208 STVC	9-5/8	8.873	8-1/2	8	8	1.93	4-1/8	1-15/16	6-5/8	9-5/8
308 STVC	9-5/8	8.873	8-1/2	8	8	1.93	5-1/2	1-15/16	6-5/8	9-5/8
111 STVC	13-3/8	12.375	12	11	11	3.00	3	3	8-1/2	11-15/16
211 STVC	13-3/8	12.375	12	11	11	3.00	4-1/4	3	8-1/2	11-15/16
311 STVC	13-3/8	12.375	12	11	11	3.00	5-9/16	3	8-1/2	11-15/16
114H STVC	16-1/4	15.125	14-2/3	14	9-3/8	3.38	4-5/16	4-1/2	12-1/2	16-5/16
214H STVC	16-1/4	15.125	14-2/3	14	9-3/8	3.38	5-3/4	4-1/2	12-1/2	16-5/16
314H STVC	16-1/4	15.125	14-2/3	14	9-3/8	3.38	7-3/16	4-1/2	12-1/2	16-5/16
118 STVC	20-3/4	19.500	18-3/4	18	11-1/2	4.00	4-3/4	5-1/4	14	19-3/8
218 STVC	20-3/4	19.500	18-3/4	18	11-1/2	4.00	6-1/4	5-1/4	14	19-3/8
118H STVC	20-3/4	19.500	18-3/4	18	11-1/2	4.00	4-3/4	5-1/4	16	21-5/8
218H STVC	20-3/4	19.500	18-3/4	18	11-1/2	4.00	6-1/4	5-1/4	16	21-5/8
318H STVC	20-3/4	19.500	18-3/4	18	11-1/2	4.00	7-3/4	5-1/4	16	21-5/8
321 STVC	23-3/4	22.500	21-3/4	21	14	5.38	9-1/8	7	16	21-5/8
124H STVC	26-3/4	25.500	24-3/4	24	16	5.38	5-7/8	7	21	27
224H STVC	26-3/4	25.500	24-3/4	24	16	5.38	7-1/4	7	21	27
324H STVC	26-3/4	25.500	24-3/4	24	16	5.38	9-3/8	7	21	27
327 STVC	29-3/4	28.500	27-3/4	27	19-1/2	7.00	9-3/4	9	21	27
230H STVC	32-3/4	31.500	30-3/4	30	22-1/2	7.00	8-1/2	9	24-3/4	32-3/8
330H STVC	32-3/4	31.500	30-3/4	30	22-1/2	7.00	11-1/2	9	24-3/4	32-3/8
336H STVC	39-3/4	38.500	37-1/2	36	28	8.00	12-5/8	13-1/2	30-1/2	38-1/4
342 STVC	47-1/4	45.000	44	42	42	10.00	11-7/8	21	35	44-1/8
248 STVC	54	52.000	51	48	35	12.00	10-7/8	21	40	52-3/8
348 STVC	54	52.000	51	48	35	12.00	13-5/8	21	40	52-3/8
260 STVC	64-3/4	62.750	62	60	36-1/8	14.00	16-1/4	22-5/8	46-1/2	61-1/2
360 STVC	64-3/4	62.750	62	60	36-1/8	14.00	20	22-5/8	46-1/2	61-1/2
460 STVC	64-3/4	62,750	62	60	36-1/8	14.00	23-1/2	22-5/8	46-1/2	61-1/2

Model No. ATD–	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z
108 STVC	8.247	4	3/4	—	7/16	10-3/8	1-3/8	1/2	1/2 NC	6	2-1/4	1/2	1/2	2
208 STVC	8.247	5-5/16	3/4	1-3/4	7/16	10-3/8	2-5/8	1/2	1/2 NC	6	2-1/4	1/2	1/2	2
308 STVC	8.247	6-5/8	3/4	3-1/16	7/16	10-3/8	3-7/8	1/2	1/2 NC	6	2-1/4	1/2	1/2	2
111 STVC	11.763	4-1/8	7/8	—	1/2	14-3/8	1-1/2	1/2	5/8 NC	8	2-1/2	7/16	1/2	2
211 STVC	11.763	5-1/4	7/8	1-3/4	1/2	14-3/8	2-7/8	1/2	5/8 NC	8	2-1/2	7/16	1/2	2
311 STVC	11.763	6-3/4	7/8	3	1/2	14-3/8	4-1/4	1/2	5/8 NC	8	2-1/2	7/16	1/2	2
114H STVC	14.451	5-1/8	1-1/8	—	5/8	17-1/2	1-7/8	5/8	5/8 NC	6	2-1/4	3/4	1/2	2
214H STVC	14.451	6-1/2	1-1/8	2	5/8	17-1/2	3-1/4	3/4	5/8 NC	6	2-1/4	3/4	1/2	2
314H STVC	14.451	8	1-1/8	3-3/8	5/8	17-1/2	4-3/4	3/4	5/8 NC	6	2-1/4	3/4	1/2	2
118 STVC	18.375	5-5/8	1-5/16	—	5/8	22	1-15/16	3/4	5/8 NC	6	2-7/16	1	1/2	3
218 STVC	18.375	7-1/8	1-5/16	2-1/8	5/8	22	3-1/2	3/4	5/8 NC	6	2-7/16	1	1/2	3
118H STVC	18.375	5-5/8	1-5/16	—	5/8	22	1-15/16	3/4	5/8 NC	6	2-7/16	1	1/2	3
218H STVC	18.375	7-1/8	1-5/16	2-1/8	5/8	22	3-1/2	3/4	5/8 NC	6	2-7/16	1	1/2	3
318H STVC	18.375	8-11/16	1-5/16	3-3/4	5/8	22	5-1/8	3/4	5/8 NC	6	2-7/16	1	1/2	3
321 STVC	21.350	10-1/8	1-5/8	4-1/4	3/4	25	6-1/8	1	5/8 NC	6	2-3/8	1	1/2	3
124H STVC	24.312	6-9/16	1-5/8	—	7/8	28	2-13/16	3/4	5/8 NC	6	2-3/4	1	1/2	3
224H STVC	24.312	8-5/8	1-5/8	2-3/4	7/8	28	4-1/2	3/4	5/8 NC	6	2-3/4	1	1/2	3
324H STVC	24.312	10-9/16	1-5/8	4-5/8	7/8	28	6-1/4	3/4	5/8 NC	6	2-3/4	1	1/2	3
327 STVC	27.361	10-3/4	1-5/8	4-5/8	7/8	31	6-1/2	1-3/8	5/8 NC	12	2-3/8	1	1/2	3
230H STVC	30.361	10-1/8	1-5/8	3-3/4	1-1/4	34	5-5/8	1-1/8	5/8 NC	12	2-7/8	1	1/2	4
330H STVC	30.361	12-3/4	1-5/8	6-1/4	1-1/4	34	8-1/8	1-1/8	5/8 NC	12	2-7/8	1	1/2	4
336H STVC	37.159	14-3/8	1-15/16	7-1/8	1-3/8	41	9	1-1/2	5/8 NC	16	2-7/8	1	1/2	4
342 STVC	43.627	14	2	7-3/8	1-3/8	49-1/4	9-5/8	1-3/4	1" NC	12	3-1/2	1-1/4	1/2	4
248 STVC	50.815	13-3/4	2-5/8	4-1/8	1-3/8	56	7-1/8	2	1" NC	12	3-1/2	1-1/4	1/2	4
348 STVC	50.815	15-3/4	2-5/8	6-7/8	1-3/8	56	9-7/8	2	1" NC	12	3-1/2	1-1/4	1/2	4
260 STVC	61.700	16-1/4	3	5-1/2	3	66-3/4	9	2-1/2	1" NC	24	2	2	1/2	6
360 STVC	61.700	20	3	9	3	66-3/4	13	2-1/2	1" NC	24	2	2	1/2	6
460 STVC	61,700	23-3/8	3	12-1/2	3	66-3/4	16.50	2-1/2	1" NC	24	2	2	1/2	6

Standard Vent Clutches

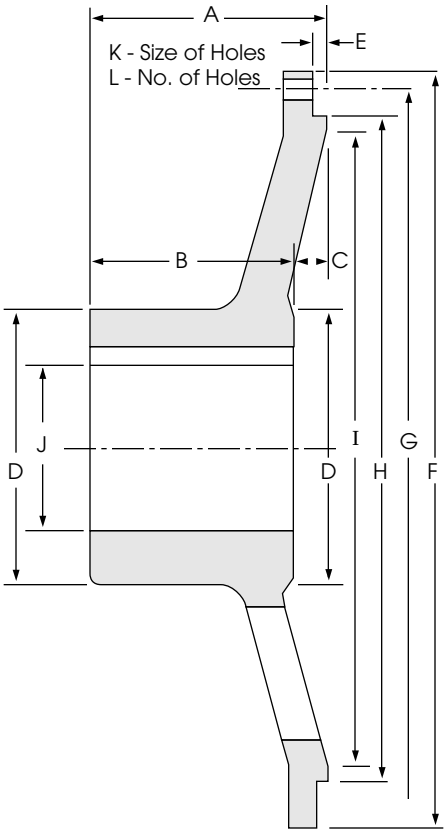
Coupling Clutches

Standard Driving Adapters

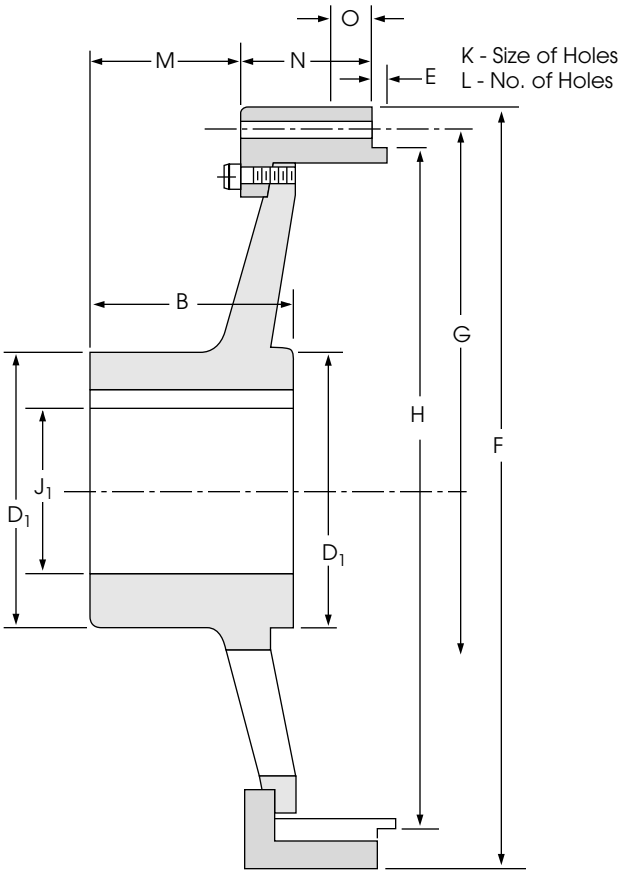
The driving adapter is designed to allow the clutch to be used in a shaft-to-shaft or through-shaft coupling arrangement.

Quick Change Adapters

The quick change feature, using a driving elbow piece between the driving adapter and the clutch driving ring, enables replacement of any wearing clutch part without disturbing either shaft.



Standard Adapter (Standard Gap)



Quick Change Adapter (Access Gap)

Size	A	B	C	D	D_1	E	F	G	+.003" -.000" H
8	3-1/8	3	1/8	3-3/4	—	1/8	10-3/8	9-5/8	8.869
11	3-5/8	3-1/4	3/8	6-1/4	5	1/8	14-3/8	13-3/8	12.371
14H	5-3/8	4-3/4	5/8	7	6-1/4	1/4	17-1/2	16-1/4	15.121
18	6-7/8	5-3/4	1-1/8	8	8	3/8	22	20-3/4	19.496
18H	6-7/8	5-3/4	1-1/8	8	8	3/8	22	20-3/4	19.496
21	6-3/4	6	3/4	9-1/2	9	1/4	25	23-3/4	22.496
24H	8-3/8	7- 5/16	1-1/16	10	10	1/4	28	26-3/4	25.495
27	8-3/4	7-3/4	1	11	11-1/2	1/4	31	29-3/4	28.495
30H	9-1/4	8-3/4	1/2	14	14	1/4	34	32-3/4	31.495
36	10-1/2	10	1/2	15	14	1/4	41	39-3/4	38.495
42	11	10	1	15	15	1/4	49-1/4	47-1/4	44.995
48	—	13 5/8	—	20	—	1/2	56	54	52.000
60	—	16-1/4	—	24	—	3/8	66-3/4	64-3/4	62.750

Size	I	Max. Bore Rect. Key J	J_1	K	L	M	N	O
8	8-3/8	2.50	—	17/32	6	1-7/8	.	—
11	11-3/4	4.13	3-3/8	21/32	8	2	2-1/2	—
14H	14-1/2	4.75	4-1/8	21/32	6	2-1/8	3-1/8	—
18	18-1/2	5.25	5-1/4	11/16	6	4-3/8	3-1/2	—
18H	18-1/2	5.25	5-1/4	11/16	6	4-3/8	3-1/2	—
21	21-3/4	6.25	6	11/16	6	4	6-1/4	—
24H	24-1/2	6.63	6-5/8	11/16	6	5-3/16	5-1/2	—
27	27-3/4	7.25	7-5/8	11/16	12	5-9/16	4-5/8	—
30H	0-1/2	9.25	9-1/4	11/16	12	6-1/2	5-3/4	—
36	37-1/2	10.00	9-1/4	11/16	16	7-7/8	4-1/8	—
42	44	10.00	10	1-1/32	12	7-7/16	5-11/16	—
48	—	15.00	—	1-1/32	12	10-1/8	6-1/8	—
60	—	18.00	—	1-1/32	24	12-1/4	11-1/2	2-1/2

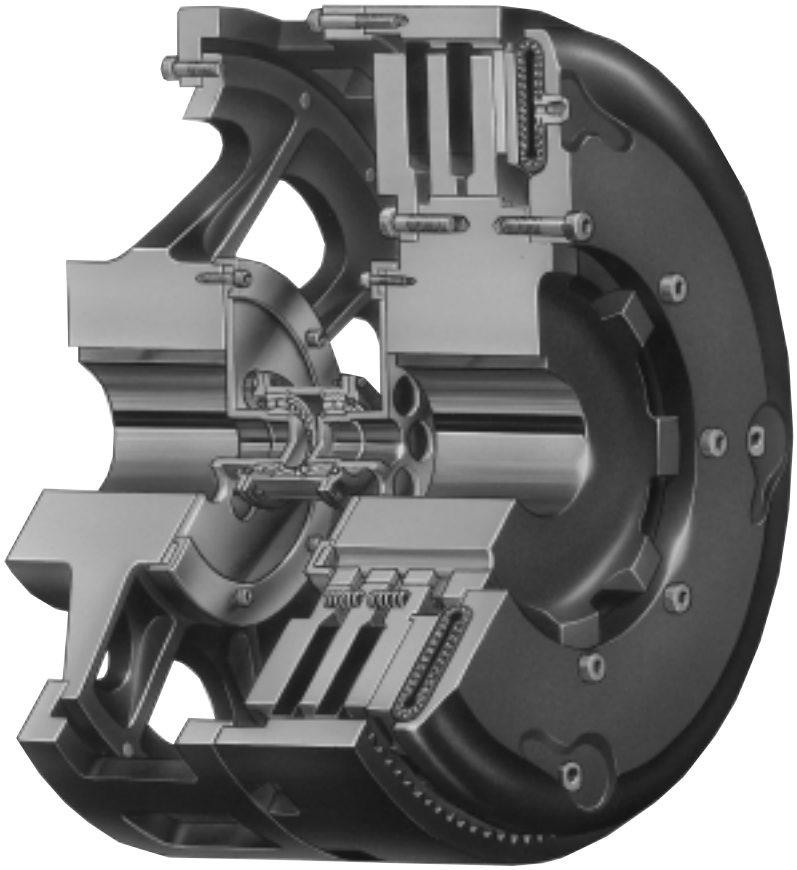
*Consult Factory

Notes: All dimensions are in inches.
For mounting, use socket head cap screws conforming to the ASTM-574-97a.

Standard Vent Clutches

Grinding Mill Clutches

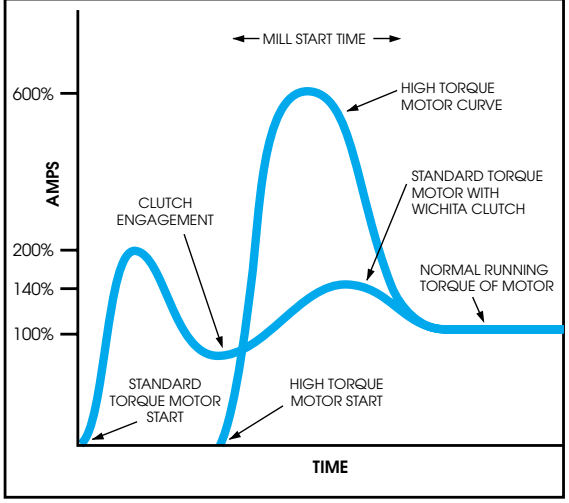
- **Designed for heavy duty applications**
- **Quick, smooth starting**
- **High heat dissipation for jogging and inching**



Wichita Grinding Mill Clutches are specially designed to provide quick, smooth starts with limited current surge for heavy duty grinding mills. The clutch is adaptable to remote control allowing centralized operation through simple air or electric circuits.

- No adjustment or lubrictation
- Eliminates need for special high torque motors.
- Torque capacity not affected by centrifugal force.
- High heat dissipation for jogging and inching.

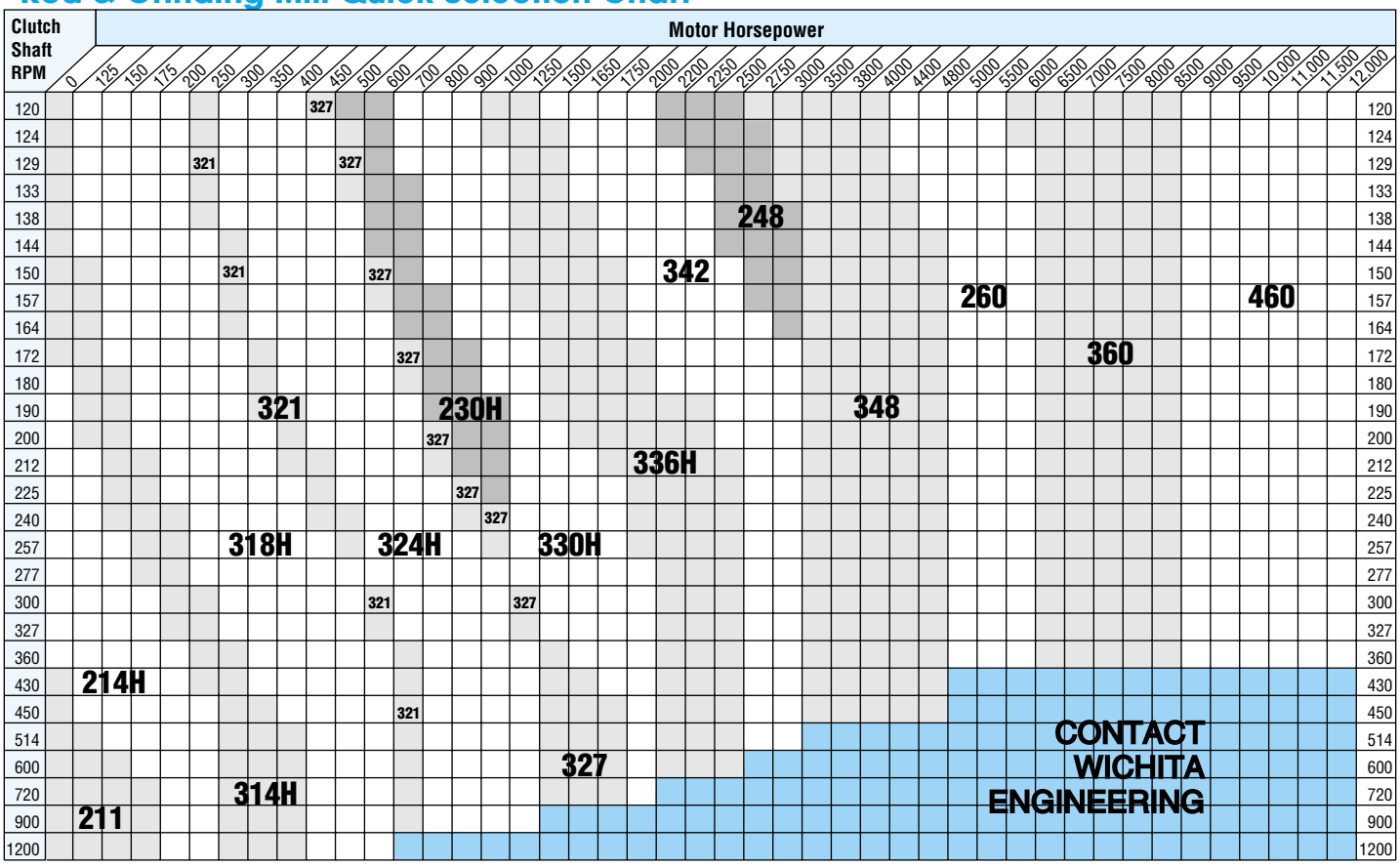
Standard Torque Motor with Wichita Clutch vs. High Torque Motor



Specifications

Technical						Capacity			
Model No. ATD–	Air Supply	Total Weight Lb.	Total Wr^2 Lb.Ft.^{2}	Driving Adapter Ring & Disc weight	Driving Adapter Ring & Disc wr^2	Diameter Friction Disc-In.	Max. Speed (RPM) For 6000 FPM @ Fric Disc O.D.	H.P. per 100 RPM	Rated Torq. inch lbs. 100 PSI
211 GMC	5/8"-18	130	24	57	16	11	2,100	50	31,800
214H GMC	5/8"-18	333	111	152	58	14	1,640	114	71,600
314H GMC	5/8"-18	385	132	190	75	14	1,640	170	107,400
318H GMC	1"-14	727	333	356	220	18	1,275	357	225,000
321 GMC	1"-14	980	663	500	280	21	1,100	417	263,000
324H GMC	1"-14	1,350	970	590	600	24	950	732	461,000
327 GMC	1"-14	1,580	1,130	675	540	27	850	821	517,500
230H GMC	1"-14	2,126	2,046	1,036	1,150	30	760	1,038	654,000
330H GMC	1"-14	2,600	2,100	1,125	1,250	30	760	1,557	981,000
336H GMC	1"-14	3,550	4,650	1,510	2,215	36	640	2,419	1,813,500
342 GMC	1-1/2"-12	4,815	10,505	2,315	6,130	42	540	3,459	2,179,000
248 GMC	1-1/2"-12	6,580	16,275	2,825	9,523	48	475	4,452	2,805,000
348 GMC	1-1/2"-12	7,540	18,470	3,274	9,700	48	475	6,679	4,207,500
260 GMC	1-1/2"-12	10,600	37,300	5,750	23,600	60	380	9,444	5,950,000
360 GMC	1-1/2"-12	13,390	47,850	5,900	27,550	60	380	14,167	8,925,000
460 GMC	1-1/2"-12	16,860	57,705	7,500	33,238	60	380	18,888	11,900,000

Rod & Grinding Mill Quick Selection Chart*



* For preliminary recommendations only — subject to approval of Wichita Clutch.
All selections based on 100 PSI operating air pressure and 200% motor torque.

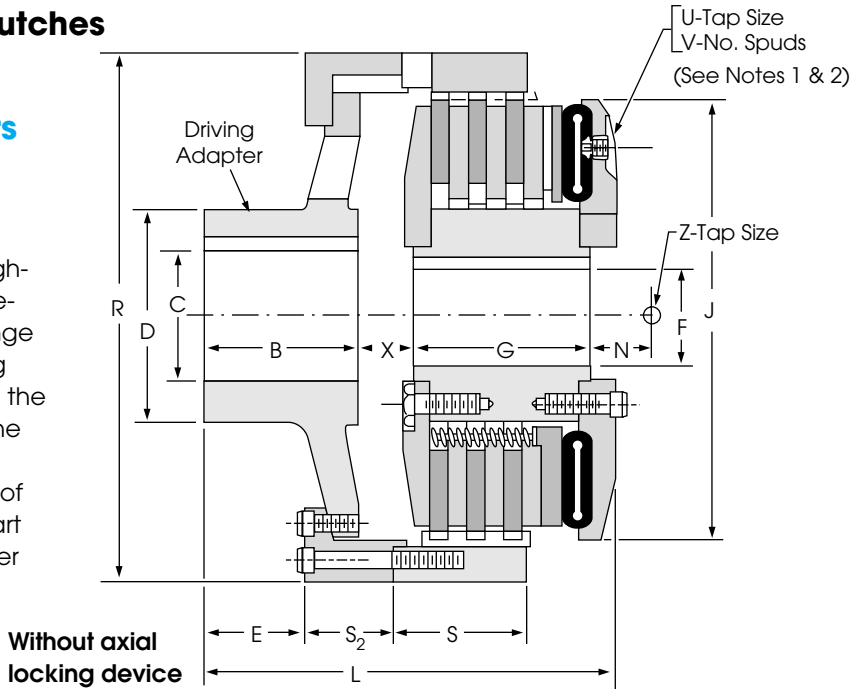
F

Standard Vent Clutches

Grinding Mill Clutches

Driving Adapters

The driving adapter is designed to allow the clutch to be used in a shaft-to-shaft or through-shaft coupling arrangement. The quick-change feature, using a driving elbow piece between the driving adapter and the clutch driving ring, enables replacement of any wearing clutch part without disturbing either shaft.



Dimensions (in) (Consult factory for drawing before final layout.)

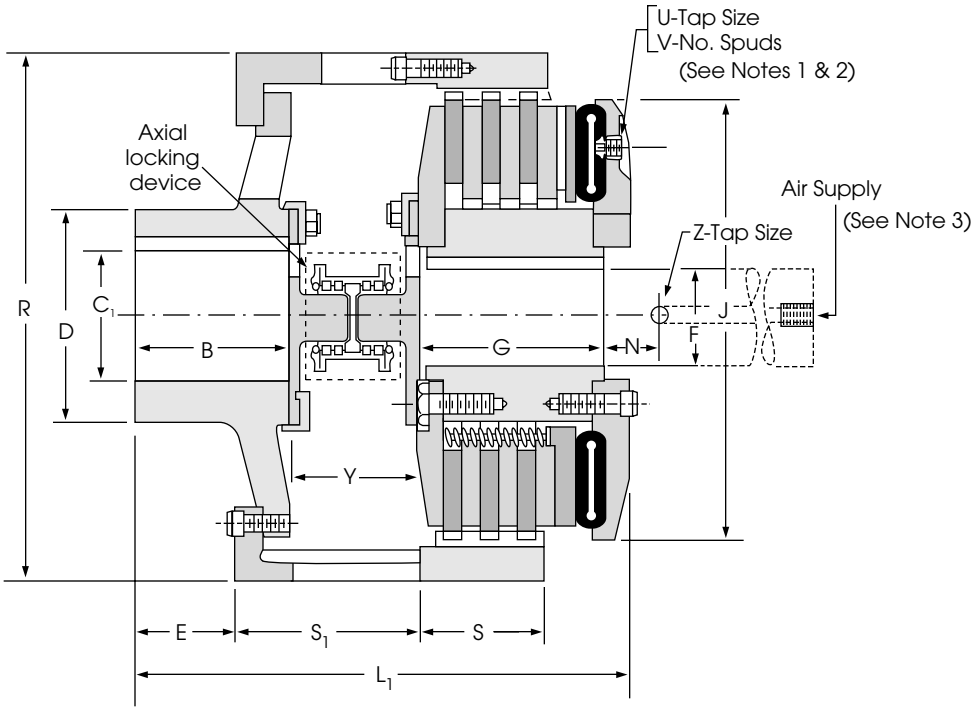
Model Size ATD–	B inches	C* max bore rect. key	C_1* max bore rect. key	D inches	E inches	F* max bore rect. key	G inches	J inches	L inches	L_1 inches
211 GMC	3.00	3.00	—	5.00	2.00	3.00	4.25	11.94	10.00	—
214H GMC	3.25	4.13	—	6.25	2.13	3.38	5.75	16.31	11.88	—
314H GMC	3.25	4.13	—	6.25	2.13	3.38	7.18	16.31	13.38	—
318H GMC	6.00	4.00	—	6.00	4.38	4.00	7.31	21.31	17.43	—
321 GMC	6.00	6.50	—	9.00	4.00	5.38	8.63	21.31	20.50	—
324H GMC	7.31	7.50	—	10.00	5.56	5.38	8.43	27.00	21.56	—
327 GMC	7.31	7.63	—	11.50	5.56	7.00	9.00	27.00	20.94	—
230H GMC	8.75	9.38	9.38	14.00	6.50	7.00	7.88	32.38	22.63	24.43
330H GMC	8.75	9.38	9.38	14.00	6.50	7.00	10.88	32.38	25.25	26.94
336H GMC	10.00	9.38	9.38	14.00	7.88	8.00	12.88	38.25	26.75	34.75
342 GMC	10.00	12.00	12.00	18.00	7.43	10.00	11.88	44.13	27.63	34.50
248 GMC	13.63	15.00	13.25	20.00	10.13	12.00	10.88	52.38	29.63	36.88
348 GMC	13.63	15.00	13.25	20.00	10.13	12.00	13.63	52.38	32.13	39.50
260 GMC	16.25	18.00	15.00	24.00	12.25	14.00	16.25	61.50	40.00	42.50
360 GMC	16.25	18.00	15.00	24.00	12.25	14.00	20.00	61.50	43.75	46.25
460 GMC	16.25	18.00	15.00	24.00	12.25	14.00	23.50	61.50	47.13	49.63

* Maximum bore uses rectangular key, contact Wichita Engineering.

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

With axial locking device

The axial locking device is an optional feature offered by Wichita. This device prevents damage to the mill motor bearings during motor start-up by axially locking the armature to magnetic center.



Notes:

1. Air Hose Kits, page 130.
2. Quick Release Valves, page 131.
3. Roto-couplings, page 131.

Model Number ATD–	N inches	R inches	S inches	S_1 inches	S_2 inches	U tap size	V spuds	X inches	Y inches	Z tap size
211 GMC	2.25	13.63	N/A	—	5.38	1/2 NPT	2	1.62	—	1/2 NPT
214H GMC	2.25	17.50	3.25	—	3.13	1/2 NPT	2	2.13	—	1/2 NPT
314H GMC	2.25	17.50	4.75	—	3.13	1/2 NPT	2	2.13	—	1/2 NPT
318H GMC	2.43	22.00	5.88	—	3.50	1/2 NPT	3	3.06	—	1/2 NPT
321 GMC	2.38	25.00	6.25	—	6.25	1/2 NPT	3	4.75	—	1/2 NPT
324H GMC	2.75	28.00	6.25	—	5.50	1/2 NPT	3	4.50	—	1/2 NPT
327 GMC	2.38	31.00	6.500	—	4.63	1/2 NPT	3	3.75	—	1/2 NPT
230H GMC	2.75	34.00	5.63	5.75	5.75	1/2 NPT	4	4.25	5.00	1/2 NPT
330H GMC	2.88	34.00	8.13	7.43	5.75	1/2 NPT	4	4.25	5.00	1/2 NPT
336H GMC	2.88	41.00	9.13	12.13	4.00	1/2 NPT	4	2.50	10.00	1/2 NPT
342 GMC	3.50	49.25	9.63	12.69	5.69	1/2 NPT	4	3.50	10.00	1/2 NPT
248 GMC	3.75	56.00	7.38	13.25	6.13	1/2 NPT	4	2.75	10.00	1/2 NPT
348 GMC	3.50	56.00	9.88	13.38	6.13	1/2 NPT	4	2.75	10.00	1/2 NPT
260 GMC	2.00	66.75	9.00	14.00	11.50	1/2 NPT	6	7.50	10.00	1/2 NPT
360 GMC	2.00	66.75	13.00	14.00	11.50	1/2 NPT	6	7.50	10.00	1/2 NPT
460 GMC	2.00	66.75	16.50	14.00	11.50	1/2 NPT	6	7.50	10.00	1/2 NPT

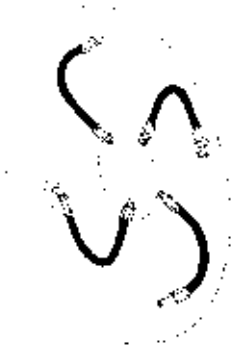
Standard Vent Clutches

Air Hose Kits

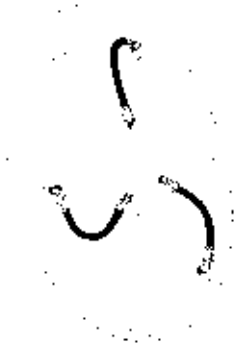
Model	Part Number
8"	8-908-812-200-3 8-908-821-200-4 QRV
11"	8-911-812-200-4 8-911-821-200-5 QRV
14"	8-914-812-201-5 8-914-821-202-5 QRV

Model	Part Number
18"	8-918-812-301-5 8-918-821-300-5 QRV
21"	8-921-812-301-5 8-921-821-302-5 QRV
24"	8-924-812-300-5 8-924-821-302-5 QRV
27"	8-927-812-300-5 8-927-821-301-5 QRV

Model	Part Number
30"	8-930-815-201-5
30"H	8-931-821-200-5 QRV
36"	8-936-815-200-5 8-936-821-200-5 QRV
42"	8-942-815-200-5 8-942-821-200-5 QRV
48"	8-948-815-200-5 8-948-821-200-5 QRV



Model	Part Number
30"H	8-931-821-400-5 QRV

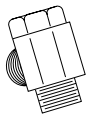


Model	Part Number
60"	8-960-812-300-5

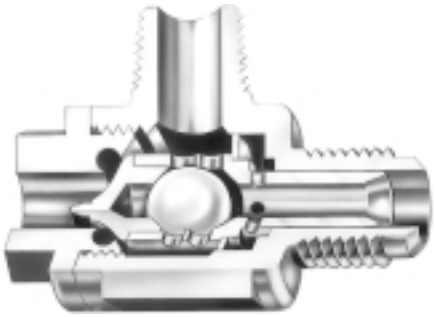
Air hose kits contain all necessary parts (fittings, hoses and extensions) to completely plumb only the clutch.

Optional Quick Release Valves can replace elbows on most units (see page 131).

Roto-couplings (see page 131).



Quick Release Valve



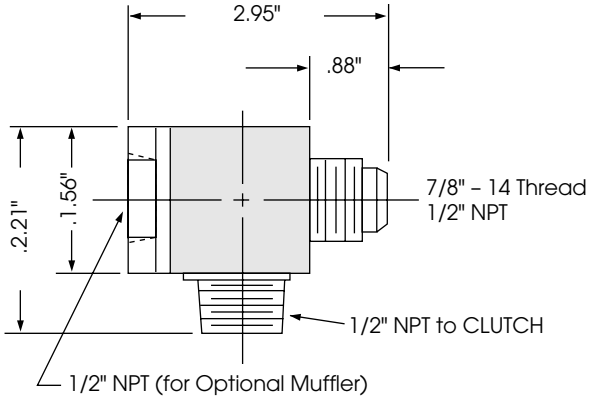
8-263-610-011-1 7/8" – 14 Thread
8-263-610-021-1 1/2" NPT

The Wichita Springless Quick Release Valve discharges twice as fast as any other valve tested in our laboratory and is four to five times faster than some common makes of valves.

This valve will close and seal with less than 20 lbs. pressure. Most others require 25 to 30 lbs. to definitely seal. In actual tests, the Wichita Valve made many hundreds of thousands of engagements and disengagements before the slightest leak occurred, or any parts needed replacement. Other valves which were tested required major replacement in fewer than 20,000 cycles.

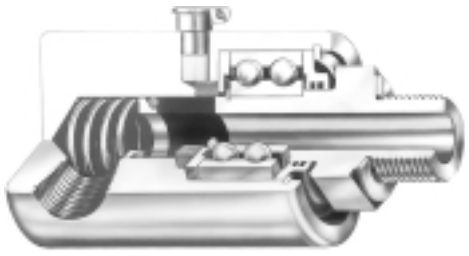
Quality Material

Body and Cap: High strength aluminum alloy
Stem: Moulded nylon
Check Valve: Nylon ball
"O" Ring: Neoprene



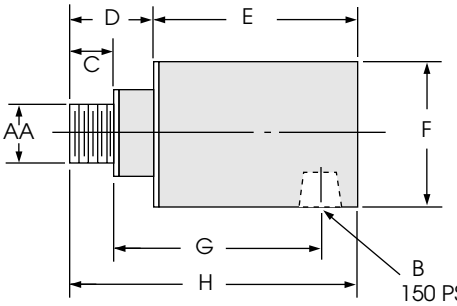
Standard thread arrangement of 1/2" size. 1/2" pipe thread on the tube connection and choice of 1/2" pipe thread, or standard 7/8-14NF thread for flared fitting thread on inlet connection. (Fits standard No. 10 high-pressure hose fitting.)

Roto-couplings



The Wichita Roto-coupling is a device to connect, or couple, a non-rotating air, gas, or fluid line to a rotating shaft.

- Long life, no maintenance.
- Felt seal eliminates bearing contamination.
- Fast, easy installation.

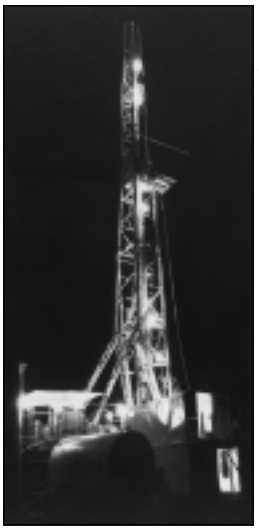


Wichita Part No.	AA	B	C	D	E	F	G	H	Max. R.P.M.
8-240-701-003-1	5/8-18NF	1/4" NPT	.40	1.046	2.250	1.500	2.13	3.297	3500
8-240-705-001-1	1"-14 NF	1/2" NPT	.75	1.250	3.188	2.500	3.00	4.438	3500
8-240-708-001-1	1"-14 NF	3/4" NPT	.75	1.313	4.688	2.875	3.69	5.440	3500
8-240-710-002-1	1-1/2"-12 NF	1" NPT	1.13	1.937	4.875	3.250	3.44	6.812	2500
8-240-712-001-1	2"-12 NF	1-1/2" NPT	1.13	2.813	5.250	4.250	5.38	8.062	2500
8-240-714-001-3	2" NPT	2" NPT	1.50	3.000	7.062	4.625	7.00	10.062	1000
8-240-716-000-3	2-1/2" NPT	2-1/2" NPT	1.88	3.250	9.375	7.000	7.75	12.625	750

Note: All measurements are in inches.

WICHITA®

Power Take-Off Clutches



Superior torque control for heavy duty diesel engines

Wichita has instituted quality assurance procedures aimed at achieving the ultimate in product reliability and its Power Take-Offs represent industry's most advanced PTO design.

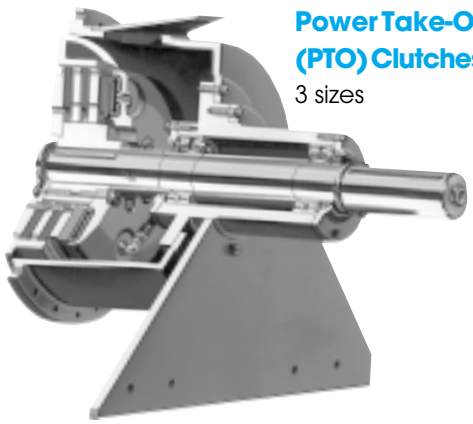
Two mechanically activated PTO's are now available in addition to the performance-proven Air Tube Disc Clutch PTO's. Complete clutch engagement of the mechanical PTO units is assured with each release of the hand lever due to the incorporation of a heavy-duty Spicer© "Solo" truck clutch. With its many outstanding features, the Spicer clutch used in the Wichita PTO prevents torsional vibration from damaging engine or transmission components, or causing spline wear. The result is superior Power Take-Off performance and durability!

Mechanical Power Take-Off Clutches

NEW!

In-Line PTO
Now in 2 sizes

Side Load PTO
2 heavy duty models



Air-Tube Disc Power Take-Off (PTO) Clutches
3 sizes

Typical Applications

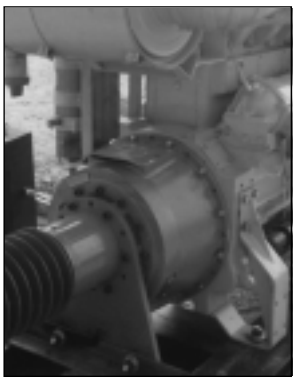
The In-line PTO design provides direct drive operation with side load capability. It has an automatic self-adjusting feature and does not require a pilot bearing. Other features such as standard SAE flywheel mounting, interchangeable clutch and clutch housing, constant plate load and easy maintenance add up to superior performance.

Wichita 15-1/2" mechanical PTO provides long service life for Cummins 855 diesel on rock crusher.

Side Load PTO's utilize a pair of heavy-duty roller bearings fitted in to the shaft housing. The bearing support system eliminates the transmission of side loads that could reduce durability or even damage the engine's crankshaft. Its torque capacities range up to 19,800 lbs. in.

Wichita mechanical PTO handles shock and heavy loads for wood chippers.

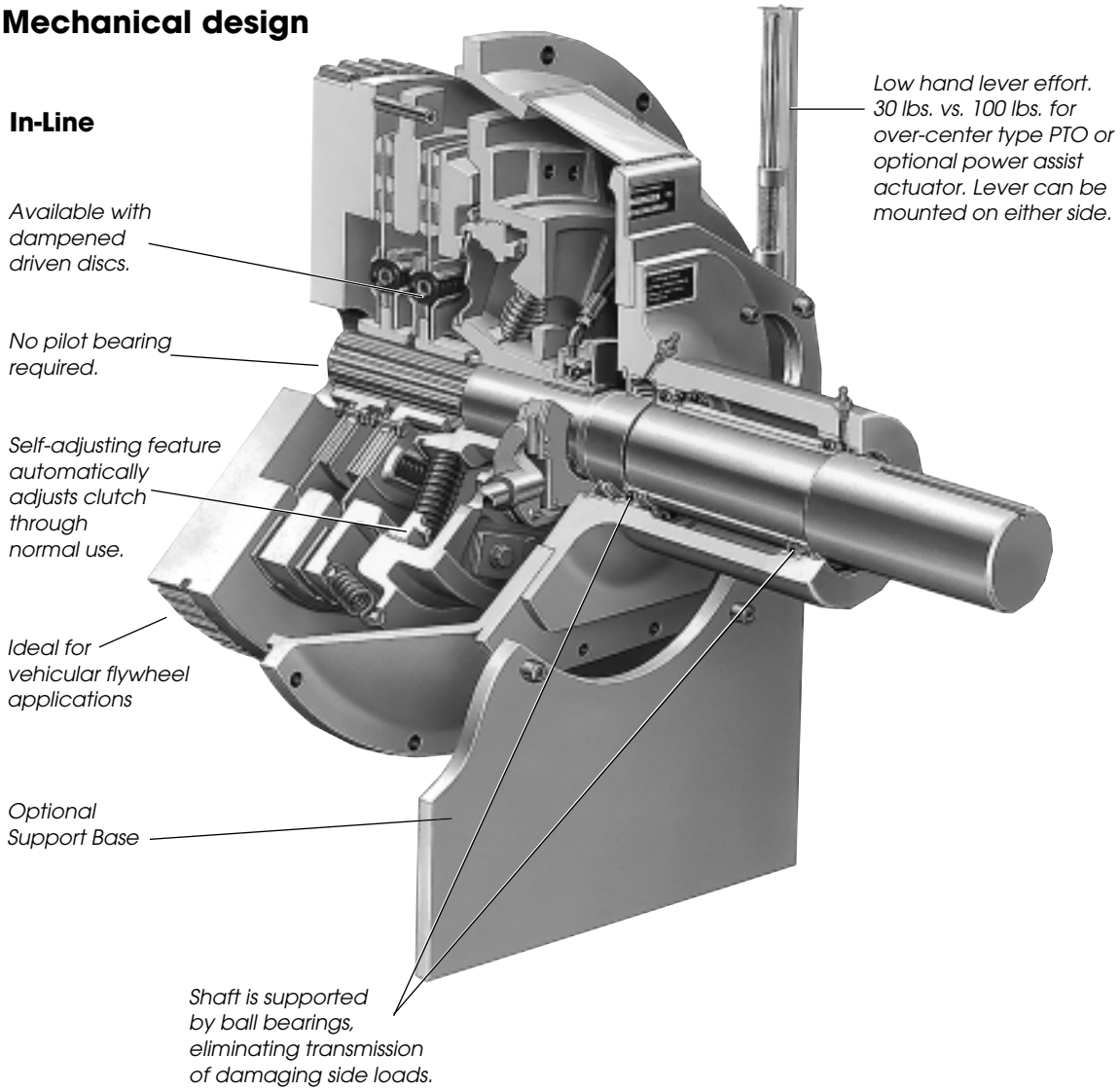
Air-Tube Disc Power Take-Off Clutches provide dependable trouble-free performance on indirect drives with large overhung loads on engines of 250-700 hp. The Wichita design isolates the side load from the engine's crankshaft for long service life. Simple air controls can be utilized to remotely control the clutch as well as the throttle. Wichita PTO's have been successfully used for oil field, construction and marine applications.



Wichita PTO mounted on Caterpillar diesel engine.

Mechanical design

In-Line



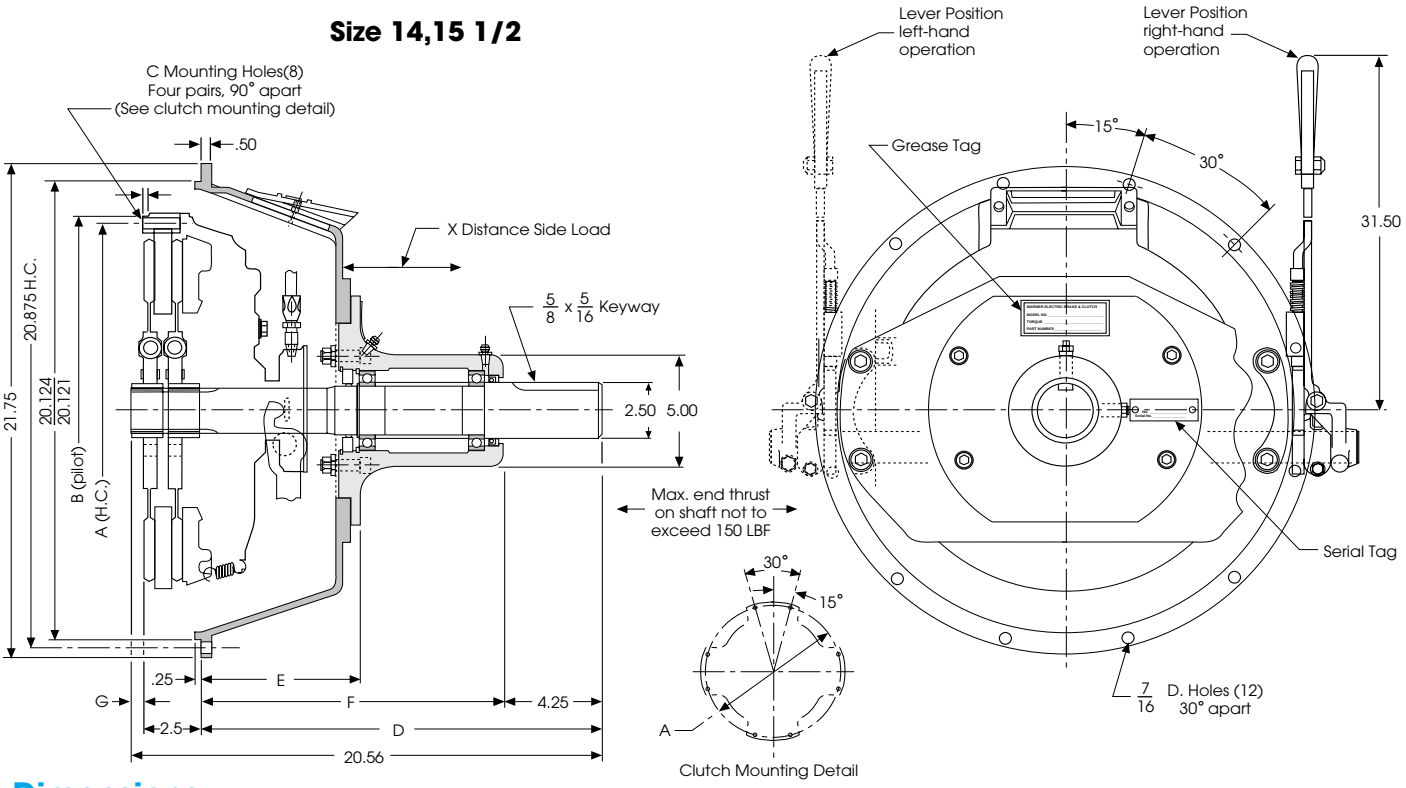
Design Features

- Side Load version incorporates a rugged taper roller bearing system which eliminates trouble-prone pilot bearings. Provides 100% external support of take-off shaft. Prevents transmission of side loads that fatigue or even damage the engine crankshaft.
- Precise alignment capabilities of the bearing system ensure flywheel/clutch concentricity to minimize effects of diesel engine torsional vibration.
- Performance-proven Spicer Solo Spring clutch provides easy engagement. Axial load is provided by three pairs of springs placed at an angle to the clutch centerline, reducing required axial force as the clutch is disengaged. The discs are raced with trapezoidal ceramic buttons, and are dampened with an assembly of coaxial springs mounted in the disc hub.
- Dampened clutch discs prevent torsional vibrations from damaging engine or components.
- Available in 2 sizes, from 14" to 15 1/2" for engines ranging from 30 HP to 700 HP.

Note: A torque limiting device may be required in certain applications over 500 HP to avoid shock overloads to the PTO from the load.

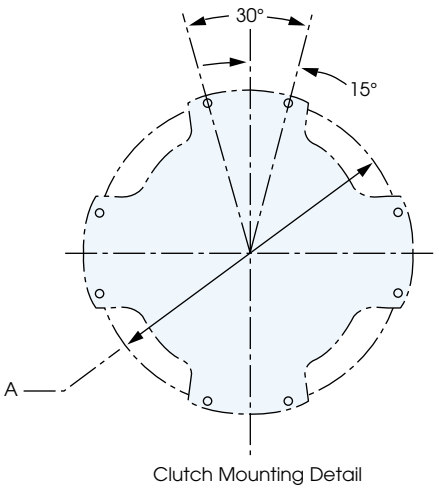
Mechanical In-line PTO (Truck Flywheel)

Size 14,15 1/2



Dimensions

Clutch Size	SAE Housing	Torque lb. in.	Drawing Number	A Hole Circle	B Pilot Dia.	C Hole Size Quantity	D	E	F	G
14	1	15,000	6-714-200-911-9	15.5	14.747 14.750	13/32 8	17.5	7.05	13.25	0.52
15 1/2	1	19,800	6-715-200-909-9	16.63	17.153 17.155	13/32 8	17.5	7.05	13.25	0.56



Clutch Mounting Detail

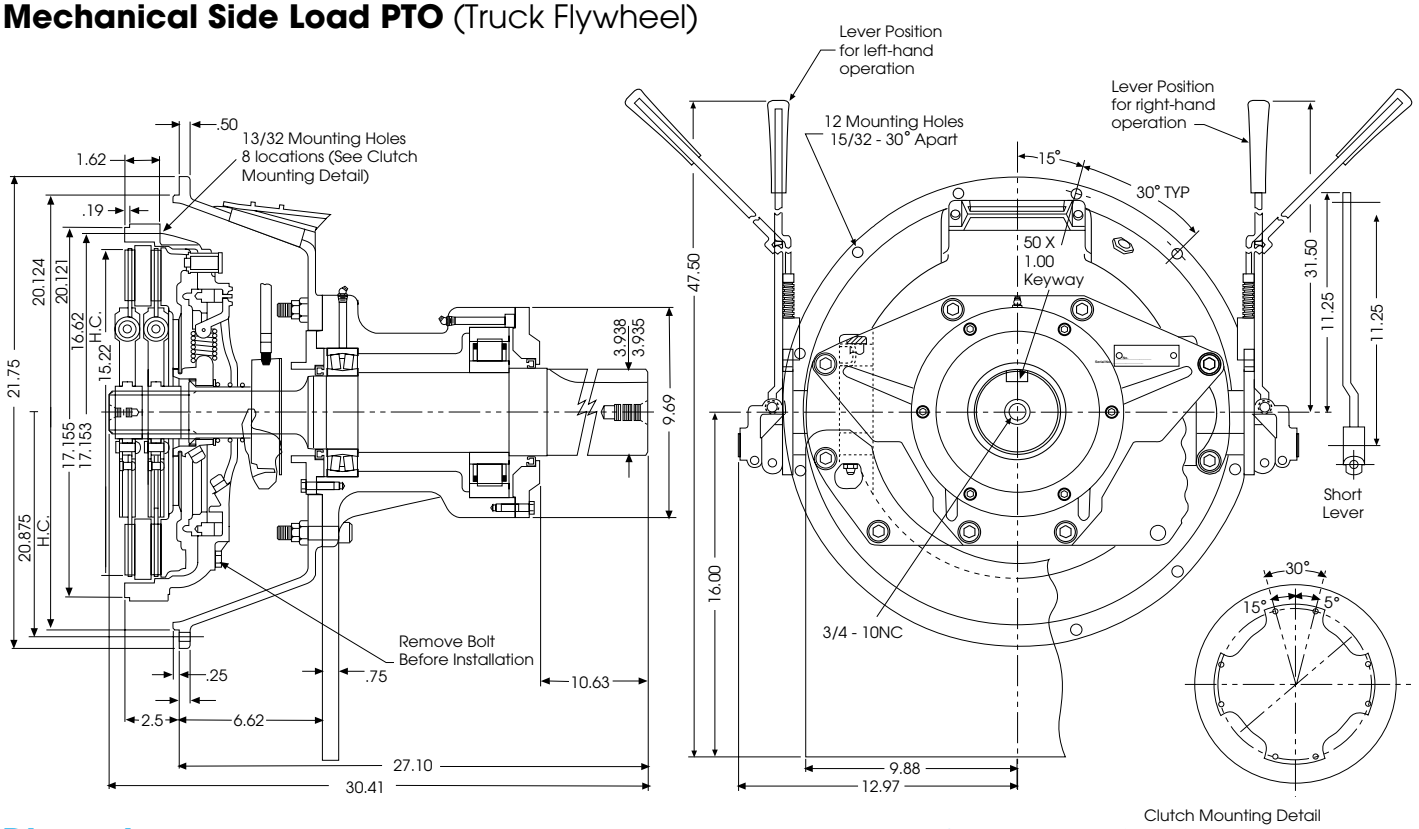
Allowable Side Load (lbs.) at 1,800 RPM

Distance from Bell Housing	Side Load (lbs.) B_{10} Bearing LIfe
3.62	1,600
4.62	1,100
5.62	850
6.62	680
7.62	565
8.62	450
9.62	400
10.26	370
11.25	340

At "X" Distance = Allowable side load in pounds at centerline of pull at 10,000 hrs B10 Bearing Life

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

Mechanical Side Load PTO (Truck Flywheel)



Dimensions

Clutch Size	SAE Housing	A Pilot (+.000/ -0.002)	B Hole Circle	C Plate Dia.	D	E Hole Size	Drawing Number
14	1	14.750	15.50	13.75	2.94	13/32	6-714-200-906-9
15.5	1	17.155	16.63	15.22	0.19	15/32	6-715-200-901-9

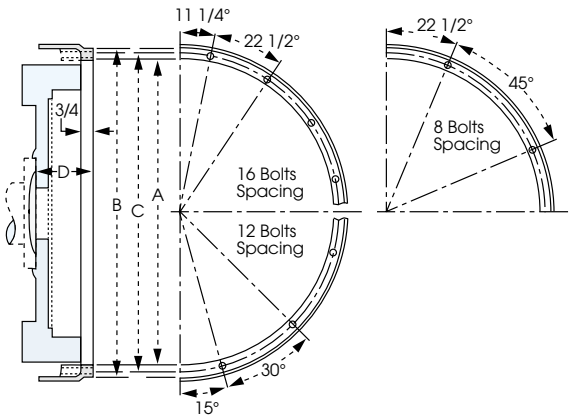
Allowable Side Load (lbs.)

X Dimension	RPM 1000	1200	1800	2200	2400
1 in.	11,100	10,700	9,500	8,900	8,200
2 in.	10,000	9,500	8,500	8,000	7,400
3 in.	9,000	8,600	7,600	7,200	6,600
4 in.	8,200	7,800	7,000	6,500	6,100
5 in.	7,500	7,000	6,300	6,000	5,600
6 in.	7,000	6,600	5,800	5,500	5,300
7 in.	6,400	6,100	5,400	5,100	4,800
8 in.	6,000	5,700	5,000	4,700	4,400
9 in.	5,600	5,300	4,700	4,400	4,200
10 in.	5,400	5,200	4,500	4,200	4,000

Engine Flywheel Housing SAE Standards

SAE Size No.	A In.	B In.	C In.	D In.	Tapped Holes No.	Tapped Holes Size
00	31.000/31.010	34-3/4	33-1/2	3-15/16	16	1/2-13
0	25.500/25.510	28	26-3/4	3-15/16	16	1/2-13
1/2	23.000/23.008	25-1/2	24-3/8	3-15/16	12	1/2-13
1	20.125/20.130	21-3/4	20-7/8	3-15/16	12	7/16-14
2	17.625/17.630	19-1/4	18-3/8	3-15/16	12	3/8-16
3	16.125/16.130	17-3/4	16-7/8	3-15/16	12	3/8-16
4	14.250/14.255	15-7/8	15	3-15/16	12	3/8-16
5	12.375/12.380	14	13-1/8	2-13/16	8	3/8-16
6	10.500/10.505	12-1/8	11-1/4	2-13/16	8	3/8-16

For flywheel standards consult the SAE standards manual.
Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.



G

Power Take-Off Clutches

Caterpillar Diesel Engines (Truck Flywheel)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Flywheel Part No.	PTO Part No.
3306T ATAAC	300 @ 1800	1	15 1/2 Mech	9N3136	6-715-200-909-9
3406T ATAAC	425@ 1900	1	15 1/2 Mech	9N3136	6-715-200-909-9
3406E	355 @ 1800 375 @ 1800 410 @ 1800 435 @ 1800 455 @ 1800 475 @ 1800	1	15 1/2 Mech	4W6800	6-715-200-909-9

Cummins Diesel Engines (Truck Flywheel)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Flywheel Part No.	PTO Part No.
N14-310 E	310 @ 1800	1 1	14 Mech 15 1/2 Mech	FW1101 FW1134	6-714-200-911-9 6-715-200-909-9
N14-330 E	330 @ 1800 330 @ 2100	1 1	15 1/2 Mech 15 1/2 Mech	FW1134 FW1134	6-715-200-909-9 6-715-200-909-9
N14-350 E	350 @ 1800 350 @ 2100	1 1	15 1/2 Mech 15 1/2 Mech	FW1134 FW1134	6-715-200-909-9 6-715-200-909-9
N14-370 E	370 @ 1800 370 @ 2100	1 1	15 1/2 Mech 15 1/2 Mech	FW1134 FW1134	6-715-200-909-9 6-715-200-909-9
N14-410 E	410 @ 1800 410 @ 2100	1 1	15 1/2 Mech 15 1/2 Mech	FW1134 FW1134	6-715-200-909-9 6-715-200-909-9
N14-435 E	435 @ 1800 435 @ 2100	1 1	15 1/2 Mech 15 1/2 Mech	FW1134 FW1134	6-715-200-909-9 6-715-200-909-9
N14-460 E	460 @ 2100	1	15 1/2 Mech	FW1134	6-715-200-909-9
N14-500	460 @ 2100	1	15 1/2 Mech	FW1134	6-715-200-909-9

Detroit Diesel Engines (Truck Flywheel)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Flywheel Part No.	PTO Part No.
671	241 @ 2300	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
671T	290 @ 2100	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
671TA	300 @ 2100	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
6V71	241 @ 2300	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
6V71T	255 @ 2100	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
6V71TA	280 @ 2100	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
8V71	320 @ 2300	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
8V71T	350 @ 2100	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
8V71TA	400 @ 2100	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
12V71	483 @ 2300	1 1	14 Mech 15 1/2 Mech	5129650 5138863	6-714-200-911-9 6-715-200-909-9
12V71T	556 @ 2100	1	15 1/2 Mech	5138863	6-715-200-909-9
6V92	328 @ 2100	1 1	14 Mech 15 1/2 Mech	5101878 5138863	6-714-200-911-9 6-715-200-909-9
6V92T	345 @ 2100	1 1	14 Mech 15 1/2 Mech	5101878 5138863	6-714-200-911-9 6-715-200-909-9
6V92TA	360 @ 2100	1 1	14 Mech 15 1/2 Mech	5101878 5138863	6-714-200-911-9 6-715-200-909-9
8V92	384 @ 2100	1 1	14 Mech 15 1/2 Mech	5101878 5138863	6-714-200-911-9 6-715-200-909-9
8V92T	465 @ 2100	1	15 1/2 Mech	5138863	6-715-200-909-9
8V92TA	480 @ 2100	1	15 1/2 Mech	5138863	6-715-200-909-9

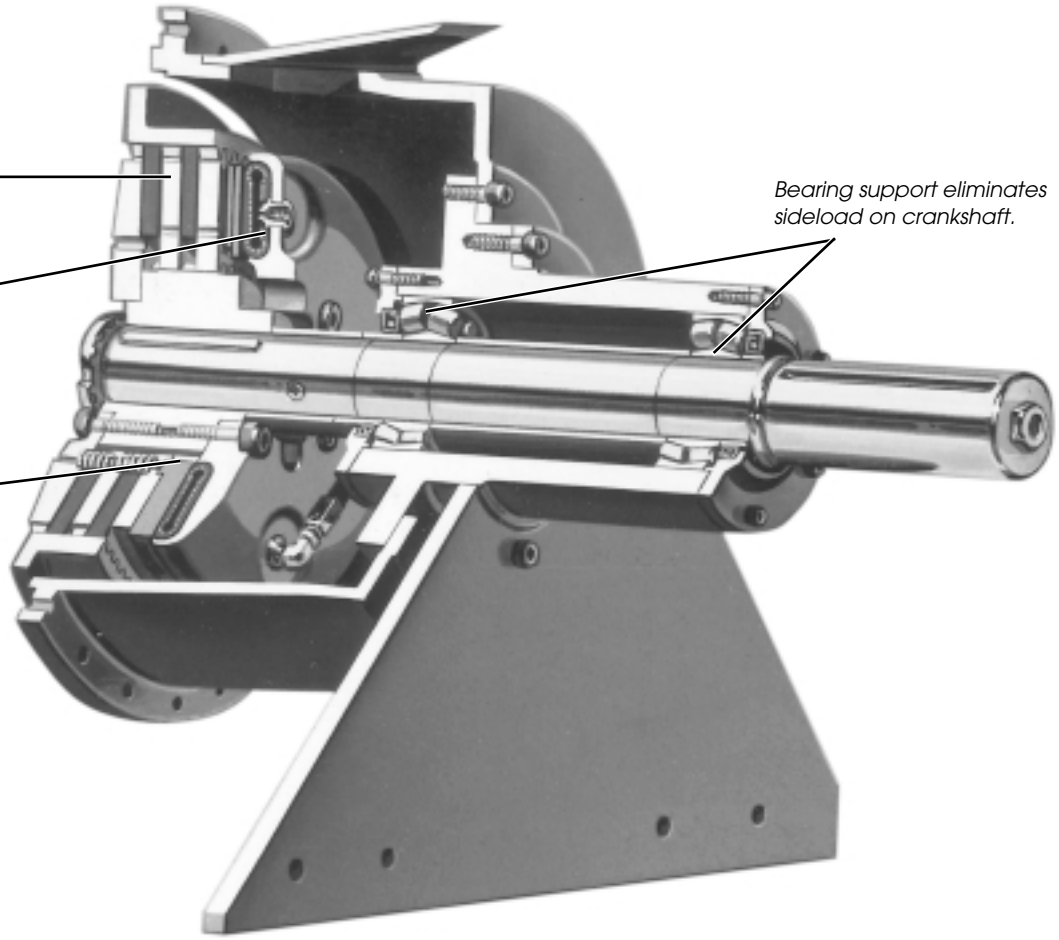
Air-Tube Disc design (Industrial)

Ideal for automatic controls.

Disc design provides smooth shock-free start-ups.

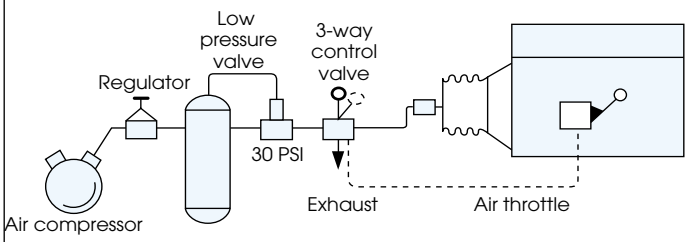
High-speed air tube not affected by centrifugal force.

No O-rings or diaphragms to wear out.



Bearing support eliminates sideload on crankshaft.

Typical air control system



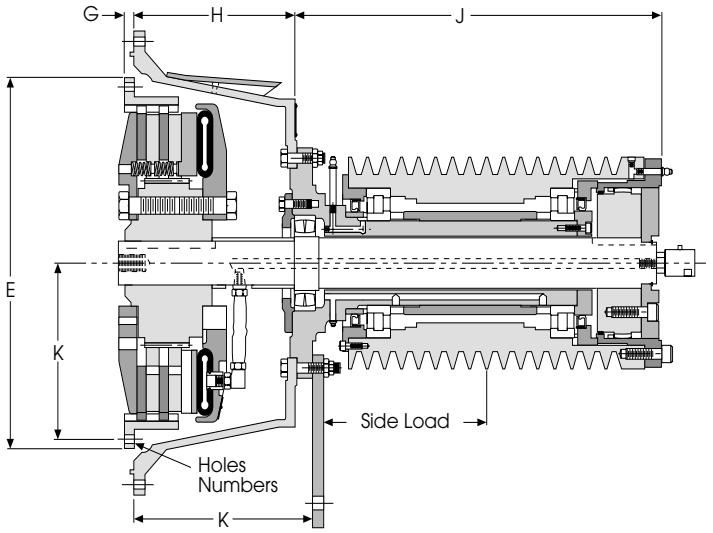
A simple air system shows that the actuation of the clutch as well as the engine throttle can easily be designed into one system.

Design Features

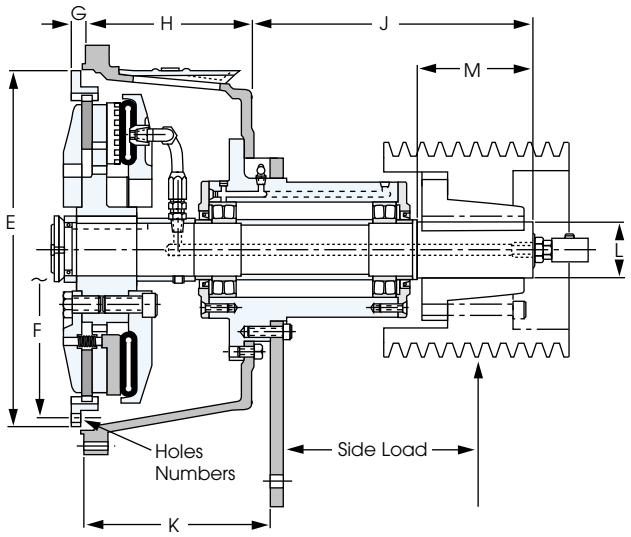
- Disc design provides smooth, shock free start-ups.
- Air activated-ideal for automatic or remote controls.
- Bearing support eliminates sideload on crankshaft.
- High speed air tube not affected by centrifugal force.
- No O-rings or diaphragms to wear out.
- Dynamically balanced for high speed operation.
- Models available for all popular diesel engines. Up to 700 HP capacity.

Air Tube Disc Side Load PTOs

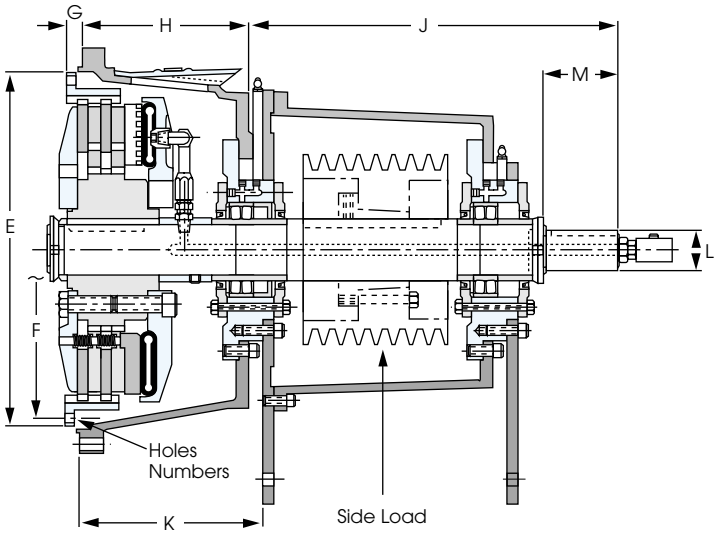
Type A



Type B



Type C



Dimensions and Specifications

Parts List No.	Clutch Size	SAE No.	Type	E +-.000 -.005	F	G	H	J	K	L +.000 -.002	M	Holes No.		Keyway	No. & Type of Grooves	P.D. of Sheave
6-715-204-302-0	214H	1	B	18.375	17-1/4	1.000	10-13/16	17-17/32	11-25/32	3.625	7-1/4	17/32	8	7/8 X 7/16	—	—
6-715-204-303-0	214H	1/2	B	18.375	17-1/4	1.750	10-13/16	17-17/32	11-1/32	3.625	7-1/4	21/32	6	7/8 X 7/16	—	—
6-715-204-304-0	214H	0	B	18.375	17-1/4	1.000	10-13/16	17-17/32	11-25/32	3.625	7-1/4	21/32	6	7/8 X 7/16	—	—
6-715-204-306-0	214H	1	C	18.375	17-1/4	1.000	10-13/16	23-15/16	11-13/16	2.500	4-5/8	17/32	8	5/8 X 5/16	8-"8V"	12.3
6-718-104-307-0	118	1/2	B	22.498	21-3/8	1.000	10-5/8	17-17/32	11-25/32	3.625	7-1/4	21/32	6	7/8 X 7/16	—	—
6-718-104-302-0	118	0	B	22.498	21-3/8	.625	10-13/16	17-17/32	11-25/32	3.625	7-1/4	21/32	6	7/8 X 7/16	—	—
6-718-104-306-0	118	0	A	22.498	21-3/8	.625	8-51/64	20-1/2	10-7/64	—	—	21/32	6	—	10-"8V"	15.2
6-718-104-304-0	118	0	A	22.498	21-3/8	.625	8-51/64	20-1/2	10-7/64	—	—	21/32	6	—	10-"D"	15.2
6-718-104-303-0	118	1/2	A	22.498	21-3/8	1.000	10-5/8	23-15/16	11-25/32	—	—	21/32	6	—	16-"8V"	12.5
6-718-104-305-0	118	0	A	22.498	21-3/8	.625	10-13/16	23-15/16	11-25/32	—	—	21/32	6	—	16-"8V"	12.5
6-718-104-301-0	118	1/2	A	22.498	21-3/8	1.000	10-5/8	23-15/16	11-25/32	—	—	21/32	6	—	20-"5V"	12.5
6-718-204-307-0	218	1/2	B	22.498	21-3/8	1.000	10-5/8	17-17/32	11-25/32	3.625	7-1/4	21/32	6	7/8 X 7/16	—	—
6-718-204-308-0	218	0	B	22.498	21-3/8	.625	11-3/16	17-17/32	12-5/32	3.625	7-1/4	21/32	6	7/8 X 7/16	—	—
6-718-204-303-0	218	1/2	A	22.498	21-3/8	1.000	10-5/8	23-15/16	11-25/32	—	—	21/32	6	—	16-"8V"	12.5
6-718-204-304-0	218	1/2	C	22.498	21-3/8	1.000	10-5/8	23-15/16	11-13/16	2.500	4-5/8	21/32	6	5/8 X 5/16	8-"8V"	12.3
6-718-204-301-0	218	0	A	22.498	21-3/8	.625	10-13/16	23-15/16	11-25/32	—	—	21/32	6	—	16-"8V"	12.5
6-718-204-306-0	218	0	C	22.498	21-3/8	.625	10-13/16	23-15/16	11-13/16	2.500	4-5/8	21/32	6	5/8 X 5/16	8-"8V"	12.3
6-718-304-300-0	318	0	B	22.498	21-3/8	.625	12-3/8	17-17/32	13-19/32	3.625	7-1/4	21/32	6	7/8 X 7/16	—	—

Note: All measurements are in inches. For standard SAE engine flywheel dimensions see page 135.

Allowable Side Load (lbs.) at 1800 RPM

Type A	Distance X from base mount-in.	Load lb.	Distance base mount-in.	Load lb.
	0	-	12	8,900
	2	5,400	14	7,100
	4	6,300	16	6,000
	6	7,500	18	5,100
	8	9,200	20	4,400
	10	12,000	22	4,300

Type B	Distance X from base mount-in.	side load lb.	Distance from base mount-in.	side load lb.
	1	-	10	4,400
	2	11,500	11	4,100
	3	9,600	12	3,800
	4	8,200	13	3,600
	5	7,200	14	3,400
	6	6,400	15	3,200
	7	5,800	16	3,000
	8	5,200	17	2,900
	9	4,800	18	2,800

Type C 6,500 lb. Max. side load.

Clutch Specifiation Table

Clutch Model	Recommeded Maximum PTO HP/100 RPM	Clutch Siip Torque lb.in. at 100 PSI .3 CF.*	Recommeded Maximum PTO HP/100 RPM With Heavy Duty Friction Disc
214H	18	71,600	23
118	21	64,500	27
218	42	129,000	54

* Recommend only 25% of rated torque on PTO's (in.lbs.) - 30% with heavy duty disc.

Note: For mounting, use socket head cap screws conforming to the ASTM-574-97a.

Diesel Engine Specifications

Quick Reference Wichita Air P.T.O. Selection

Tables and graphs are shown to indicate the maximum side load that can be accommodated. The number of 8V Section belts is compatible with the horsepower of the engine.

Caterpillar Diesel Engines (Industrial)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Part Number
3306T	250 @ 2200	1	214-B	6-715-204-302-0
3306TA	300 @ 2200	1	214-B	6-715-204-302-0
3406T	325 @ 2100	1	214-B	6-715-204-302-0
3406TA	400 @ 2100	1	214-B	6-715-204-302-0
3408T	425 @ 2100	0	118-B	6-718-104-302-0
3408TA	505 @ 2100	0	218-C	6-718-204-306-0
3508TA	775 @ 1800	0	218-A	6-718-204-301-0
3508TA	800 @ 1300	0	Consult Factory	
3508	855 @ 1800	0	Consult Factory	
3116	190 @ 2400	1	214-B	6-715-204-302-0
G342 SI-NA	210 @ 1000	0	118-B	6-718-104-302-0
G342 SI-TA-SC	250 @ 1000	0	218-B	6-718-204-308-0
G342 SI-NA	225 @ 1200	0	118-B	6-718-104-302-0
G342 SI-NA-SC	265 @ 1200	0	118-B	6-718-104-302-0

Cummins Diesel Engines (Industrial)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Part Number
8.3	250 @	1	214 Type B	6-715-204-302-0
L-10	325 @	0	214 Type B	6-715-204-304-0
N-855	450 @	1	214 Type B	6-715-204-302-0
K-19	450 @ 1800	0	218 Type B	6-718-204-308-0
K-19	700 @ 2100	0	218 Type C	6-718-204-306-0
V-28	700 @ 2100	0	218 Type C	6-718-204-306-0
V-28	900 @ 2100	0	218 Type A	6-718-204-301-0
K-38			Consult Factory	
K-50			Consult Factory	

Scania Diesel Engines (Industrial)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Part Number
DS9 DSC9	208 256 @ 1900	1	214-B	6-715-204-302-0
DS11 DS111	313 345 @ 1800	1	214-B	6-715-204-302-0
DSC11	360 @ 1800	1/2	218-B	
DS14 DS114 DSC14	405 @ 1800 438 @ 1800 455 @ 1800	1/2	218-B	6-718-204-303-0

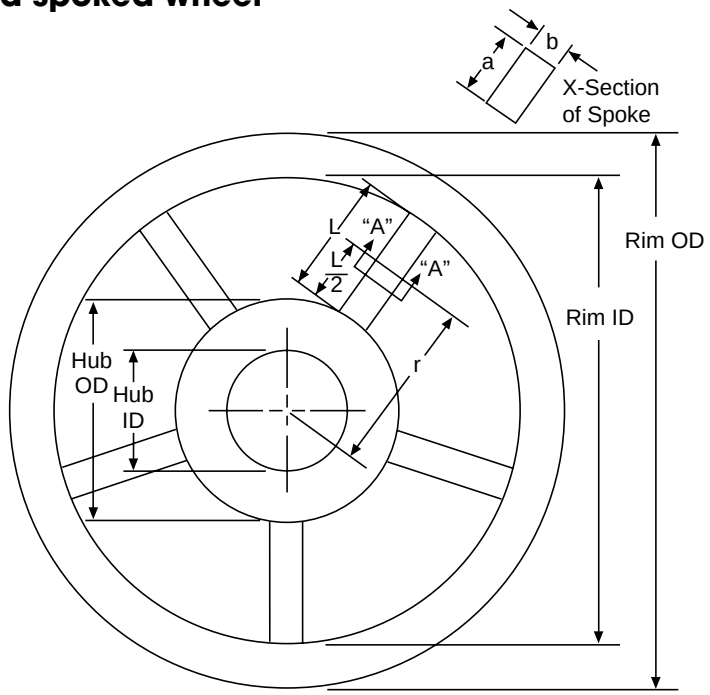
Detroit Diesel Engines (Industrial)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Part Number
6V71	241 @ 2300	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
6V71T	255 @ 2100	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
6V71TA	280 @ 2100	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
8V71	320 @ 2300	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
8V71T	350 @ 2100	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
8V71TA	400 @ 2100	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
12V71	483 @ 2300	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
12V71T	556 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
12V71TA	600 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
16V71	615 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
16V71TA	760 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
6V92	328 @ 2100	1 1/2 0	214-B	6-715-204-302-0 6-715-204-303-0 6-715-204-304-0
6V92T	345 @ 2100	1 1/2 0	214-B	6-715-204-302-0 6-715-204-303-0 6-715-204-304-0
6V92TA	360 @ 2100	1 1/2 0	214-B	6-715-204-302-0 6-715-204-303-0 6-715-204-304-0
8V92	384 @ 2100	1 1/2 0	214-B	6-715-204-302-0 6-715-204-303-0 6-715-204-304-0
8V92TA	480 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
12V92T	655 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
12V92TA	700 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0
16V92	769 @ 2100	1/2 0	218-A	6-718-204-303-0 6-718-204-301-0
16V92T	860 @ 2100	1/2 0	218-A	6-718-204-303-0 6-718-204-301-0
16V92TA	1110 @ 2100	Consult Factory		
471T	200 @ 2100	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
471T	225 @ 2200	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
671	241 @ 2300	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
671T	290 @ 2100	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
671TA	300 @ 2100	1 1/2	214-B	6-715-204-302-0 6-715-204-303-0
8V92T	465 @ 2100	1/2 0	218-C	6-718-204-304-0 6-718-204-306-0

Deere Diesel Engines (Industrial)

Engine Model	HP @ RPM	Bell Housing	PTO Size & Type	Part Number
6076T 6076A 6076H 6619A 6101A 6101H	170 @ 2200 215 @ 2200 235 @ 2200 255 @ 2100 275 @ 2100 320 @ 2100	1	214-B	6-715-204-302-0

How to calculate inertia (WR^2) of a spoked wheel



$$WR^2_S \text{ of Spokes} = \left(\left(\frac{b^2 + L^2}{1728}\right) + \left(\frac{r^2}{144}\right)\right) \text{ x (wt of Spokes) x (No. of Spokes), lb.ft.}^2$$

$$WR^2_R \text{ of Rim} = \left(\frac{(\text{Rim OD})^2 + (\text{Rim ID})^2}{1152}\right) \text{ x (wt of Rim), lb.ft.}^2$$

$$WR^2_H \text{ of Hub} = \left(\frac{(\text{Hub OD})^2 + (\text{Hub ID})^2}{1152}\right) \text{ x (wt of Hub), lb.ft.}^2$$

$$\text{Total Flywheel Inertia} = WR^2_S + WR^2_R + WR^2_H$$

Clutch heat horsepower absorption rate

Absorption rate/in.² of lining area. For one stop at 70°F ambient temperature.

Slip time seconds		0 to 1	2	3	4	5	6	7	8	9	10
Heat Input	ft.lb./in.²	380	617	820	1000	1175	1330	1485	1630	1770	1900
	hp/in.²	.7	.56	.5	.45	.43	.4	.38	.37	.36	.34

Consult factory for slip time over 10 seconds.

Engineering formulas

Definitions

T	Torque-The moment of a system tends to cause rotation lb.in. % forces.
WR^2	Inertia-weight times radius of gyration^2 lb.ft.^{2}
PSI	Pounds per square inch.
WT	Weight-lbs.
Btu	British Thermal Unit = 778 ft.lbs. or one Btu.
CPM	Cycles per minute.
CF	Coefficient of friction.
C°	Degrees Celcius.
F°	Degrees Fahrenheit.
LN	Natural base log.
K and U	Inflation coefficients for specific clutch and brake. See specification tables.
R, E and V	Exhaust coefficient for specific clutch and brake. See specification tables.
KW	Keyway.
rpm	Revolutions per minute.
t	Seconds.
TIR	Total Indicator run out.
V	Volume-in^3.
hp	Given amount of work in a specific time. 1 horsepower = 33,000 ft.lbs. per minute.

Formulas

Torque lb.in. = $\frac{(HP)\ (63{,}000)}{RPM}$

Horsepower HP = $\frac{(\text{Torque lb.in.})\ (RPM)}{(63{,}000)}$

Acceleration Torque (lb.in.) = $\frac{(WR^2)\ (RPM)}{(25.6)(t)}$

t = time in seconds for acceleration or deceleration.

HP/100 RPM = $\frac{(HP)\ (100)}{(RPM)}$ = $\frac{\text{Required Torque lb.in.}}{(630)}$

Required Unit PSI = $\frac{(\text{Unit required Torque lb.in.})\ (100\ PSI)}{(\text{Unit rated torque lb.in.})}$

Contact velocity FPM = $\frac{(\text{Unit diameter in.})\ (\pi)(RPM)}{(12)}$

Unit heat HP = $\frac{(\text{Total } WR^2)\ (RPM)^2\ (CPM)}{1.9 \times 10^8}$

Tension Value Chart

Material	Tension (lbs/inch of web width)
Steel foils	1.5 to 4
Aluminum foils	0.5 to 1.5 (1.0 aver.)/mil
Cellophanes	0.5 to 1.0/mil
Acetate	0.5/mil
Mylar (Polyester)	0.25 to 0.30/mil
Polyethylene	0.25 to 0.30/mil
Polypropylene	0.25 to 0.30/mil
Polystyrene	1.0/mil
Saran	0.05 to 0.20 (0.10 aver.)/mil
Vinyl	0.05 to 0.20 (0.10 aver.)/mil
Paper and Laminations	
20#/R—32.54 gm/m2	0.50 to 1.0
40#/R—65.08 gm/m2	1.0 to 2.0
60#/R—97.62 gm/m2	1.5 to 3.0
80#/R—130.0 gm/m2	2.0 to 4.0
Paper	
15 lbs./ream (3000 sq.ft.)	0.5
20 lbs./ream	0.75
30 lbs./ream	1.0
40 lbs./ream	1.5
80 lbs./ream	2.5
Laminations	
25 LB. PAPER/.005 PE/.00035" FOIL/.001"PE	3.0
.001" Cello/.0005"PE/.001" Cello	1.5

When these substrates are coated with polyethylene, nylon polypropylene EVA, EAA, and EEA, add the following tension to the values listed above for the substrate only.

Coating Thickness	
0.0005" to 0.0001	0.12
0.0011" to 0.002	0.25
Cellophane	
.00075"	0.5
.001"	0.75
.002"	1.0

Material	Tension (lbs/inch of web width)
Nylon and Cast Propylene (non-Oriented)	
.00075"	0.15
.001"	0.25
.002"	0.5
Mylar and Oriented Propylene	
0.0005"	0.25
0.001"	0.5
0.002"	1.0
Paperboard	
8 pt.	3.0
12 pt.	4.0
15 pt.	5.0
20 pt.	7.0
25 pt.	9.0
30 pt.	11.0

Material	Tension (lbs/strand)
Aluminum Wire	
#20 AWG	4.00
#18 AWG	5.50
#16 AWG	9.00
#14 AWG	10.00
#12 AWG	12.00
#10 AWG	15.00
#8 AWG	25.00
Copper Wire	
#20 AWG	8.00
#18 AWG	10.00
#16 AWG	12.00
#14 AWG	15.00
#12 AWG	18.00
#10 AWG	20.00
#8 AWG	25.00

Glossary of Terms

ATHP **Air-tube Holding Plate**: A Plate having a cavity which houses the air-tube.

AT **Air-tube**: Actuating member, full circle polyester reinforced neoprene tube.

AT/P **Air-tube Pancake Style**: Air-tube which does not have center hole as in regular air-tube.

AT/S **Air-tube Split**: A regular air-tube that is split radially for temporary replacement of a regular air-tube. This has a comparatively short life expectancy.

ALD **Axial Locking Device**: This device axially locks two shafts together without transmitting torque. Its primary use is in attaching a sleeve bearing motor to an axially located pinion shaft.

BP **Back Plate**: The retaining plate on the opposite end of the clutch or brake unit. It is either bolted to the low inertia driving ring or the standard-special ventilated clutch hub.

CCB **Combination Clutch Brake**

CI **Cast Iron**: Iron material with sufficient carbon so it is not malleable at any temperature.

C/P **Center Plate**: This plate is of metal and has a gear tooth spline or other driving system on the internal diameter of the plate that meshes with the clutch or brake hub.

CWJ **Center Water Jacket**: This is a two wear sided water jacket assembly that is splined on the outside diameter. This part is used in a water cooled clutch or brake of more than one drive plate.

CWP **Copper Wear Plate**: Copper disc mounted to a water jacket.

DA **Driving Adapter**: A device to bolt a standard ventilated type clutch driving ring to a shaft.

DAF **Driving Adapter Flange**: A driving ring connecting the driving adapter and the clutch's driving ring.

DI **Ductile Iron**: Nodular cast iron, a semi-steel.

DSCP **Ductile Slotted Center Plate**: A ductile, cast iron center plate that has thermal growth slots in the plate to allow for thermal growth of center plate.

DCP **Ductile Center Plate**: Center plate made of ductile iron (Nodular cast iron).

DR **Driving Ring**: Unit's outer housing. Transmits torque from friction discs.

DMBP **Demountable Backplate**: A removable backplate which allows access from rear of unit.

E to P **Current to Pneumatic Transducer**

FD **Friction Disc**: Molded friction elements.

F/P **Floating Plate**: Similar to Center Plate, next to the pressure plate.

FWJ **Floating Water Jacket**: Similar to Center Water Jacket. Located between pressure plate and drive plate assembly.

FP **Friction Puck**: Segmented friction element used on drive plate assemblies.

G1S **Friction Disc**: Grooved one side.

G1SSH **Friction Disc**: Grooved one side with spring holes.

G2SBB **Friction Disc**: Grooved two sides back to back.

G2SBBSH **Friction Disc**: Grooved two sides back to back with spring holes.

G2SSSH **Friction Disc**: Grooved two sides staggered with spring holes.

GID **Friction Disc**: Grooved on inside diameter.

GPM **Gallons Per Minute**

HUB & ATHP **Hub and Air-tube Holding Plate**: Special one piece design.

HC **High Coefficient Friction**

HS **High Speed**: Special air-tube designed for high speed applications.

HT **High Torque**: Clutch design with pancake air-tube.

HUB & BP **Hub and Backplate**: Special one-piece design.

HUB **Hub**: Splined tooth gear, keyed to the shaft.

LC **Low Coefficient Friction**

L/T **Low Temperature**: Special air-tube designed for low temperatures down to -40° F.

LPM **Liters Per Minute**

MR **Marine Reverse**: Special Standard Vent Clutch.

NC **National Course**: Thread type.

NF **National Fine**: Thread type.

NPT **National Pipe Thread**: Thread type.

OBS **Obsolete**: Discontinued part.

OSO **Obsolete Service Only**: Discontinued service.

PLI **Pounds Per Linear Inch**

PLK **Positive Lock**: Special unit allowing direct drive between air-tube holding plate and the ring in case of air-tube failure.

QRV **Quick Release Valve**: Springless exhausting air valve.

QCRG **Quick Change Ring**: A driving ring connecting the driving adapter and the clutch's driving ring used for quick access to clutch's internal parts.

RCS **Roto Coupling Spider**: A clutch air manifold, with its center tapped to accept a roto coupling.

RC **Roto Coupling**: An air rotary union having a hollow shaft in bearings located within a stationary housing to allow for a supply hose connection without twisting the air hose.

TSCP **Thin Slotted Center Plate**: This center plate is similar to the DSCP but is of the thin, usually nonventilated center plate design.

Parts List and Assembly Drawing Numbers

Clutches and Brakes

( ) - ( )( )( ) - ( )( )( ) - ( )( )( ) - ( )

Group Number

6	Clutch
7	Brake

TYPE OF UNIT

Clutches

	When Unit Number is (6) Use These Numbers
0	Low Inertia
1	Standard Ventilated
2	Special & Super Vent.
3	Kopper Kool
4	Water Cooled
5	Mechanical
6	Tooth Clutch
7	Power Take Off
8	E.P.
9	Other Than Above

Brakes

	When Unit Number is (7) Use These Numbers
0	Low Inertia
1	Spring Set
2	Motor Brake
3	Kopper Kool
4	Water Cooled
5	Spot or Caliper
6	Band Brake
7	Tandem Mount
8	E.P.
9	Other Than Above And Combo Clutch/Brake

Size of Unit

01	Less Than 2"
02	
03	
04	4"
05	5"
06	6"
07	7"
08	8"
09	9"
10	10"
11	11"
*	*
*	*
*	*
00	Cannot Be Classified In Two Digits

Note: "H" Clutches are indicated by next inch size up from actual size, i.e., 31 = 30H Unit.

15	14H
19	18H
25	24H
31	30H
37	36H

Sequential Numbers

Number of Plates

1	1 Plate
2	2 Plate
3	3 Plate
4	4 Plate
5	5 Plate
6	6 Plate
7	7 Plate
8	8 Plate
9	9 Plate
0	Other Than Above

Type of Air Tube

0	No Air Tube
1	Regular
3	High Speed
4	Pancake
5	Low Temperature
8	Diaphragm
9	Other Than Above Or Any Of Above When an Assembly Drawing No.

Origin

C	U.S.A.
1	English
2	Metric
3	Mixed
4	Drum Type
5	
6	
7	
8	Deleter
9	Indicates An Assembly Drawing No.

Sequential Numbers

00-99

Use this chart only to interpret a part number issued by Wichita Clutch. Do not use it to determine your own part number.

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