

Designed for the water and wastewater industry

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H1900 OVERLOAD CLUTCHES

H1900 OVERLOAD CLUTCHES WASTEWATER TREATMENT INDUSTRY WOR SERIES

FEATURES:

- Automatic or manual reset
- Large bore capacity
- Through shaft or end shaft mounting
- Accurate torque release
- Stainless steel enclosure
- Electroless nickel plated
- Adaptable for all drives
- Operating parts are hardened for long life

OPERATING PRINCIPLES

The WOR Series H1900 is a mechanical ball detent overload release clutch. It has been designed to provide accurate and dependable torque overload protection for mechanical water and wastewater treatment equipment.

Torque is transmitted between the balls and the detents of the rotor in the following manner:

The chrome alloy balls are forced into the detents of the 50 Rc hardened rotor by an axial load generated by compressing a spring pack. This axial load is what determines the torque capacity of the clutch. Increasing or decreasing the spring compression or changing spring packs provides a means for multiple torque adjustments. When a torque overload condition occurs, the balls roll out of the rotor detents. This rolling action reduces any fluctuation in torque due to frictional changes (See Figure 1).

The movement of the cover during disengagement of the balls can be used to trip a limit switch and signal an overload condition. The drive should be shut down immediately and the source of the overload determined and cleared. After the clutch has been reset the drive can then be restarted.

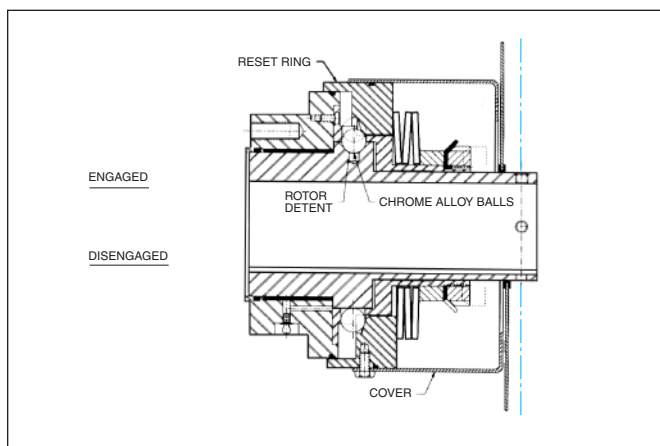


FIGURE 1



The **Manual Reset** (Style M or N) clutch can be reset in multiple positions. Rotate the drive until a lube fitting or a barring hole on the housing lines up with a tapped hole on the rotor. The rotor keyway should also be lined up with a lube fitting on the housing. After the proper position has been established, push evenly on both sides of the limit switch actuating plate. When the clutch is properly reset, the steel balls will move back into their detents and the actuating plate will return to its original position. An audible sound will be detected when the clutch re-engages, (See Figure 2).

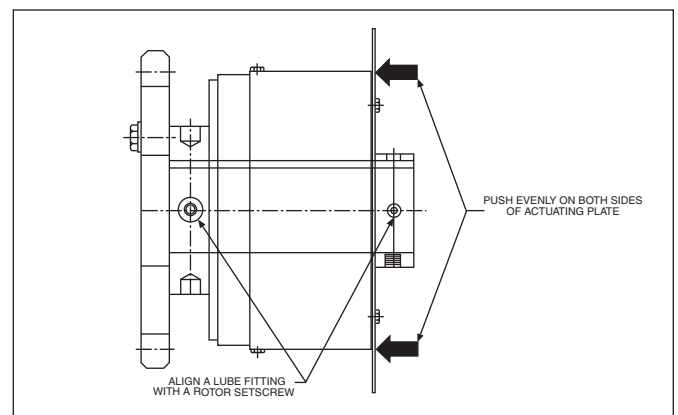


FIGURE 2

The **Automatic Reset** (Style A or B) version will re-engage without manual assistance. The steel balls will move back into their pockets every 1/4 of a revolution (1/8 of a revolution on the Size 11). After the overload condition has been cleared, jog the drive until the balls return to their detents and the actuating plate returns to its original position. An audible sound will be detected when the clutch re-engages.

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H1900 OVERLOAD CLUTCHES

SELECTION

1. Determine the overload release torque by one of these methods:

- Use the torque formula with horsepower and RPM specific to selected clutch location. A service factor may be required for high inertia starts, reversing or peak load conditions, (refer to Page 86 for service factor information. For average applications, a service factor "SF" of 1.25 is recommended):

$$\text{Torque (Lb. In.)} = \frac{\text{HP} \times 63025}{\text{RPM}} \times \text{SF}$$

- Maximum drive torque of chain: If using non-metallic chain, contact the manufacturer of the chain and ask for its maximum drive torque.
- For shear pin replacement: Contact your local Boston Gear Area Sales Manager or the factory. They will gladly calculate the shear torque of your existing shear pins for you.

- Determine the bore size and keyway.
- Choose the proper style from Figures 3, 4, or 5 based upon the drive layout.
- Refer to the Basic Selection Chart for the appropriate clutch size.

BASIC SELECTION CHART

Size	Torque Code	Torque Range (Lb.-In.)		Maximum Bore (In.)*	
		Minimum	Maximum	Style A/M	Style B/N
05	L	850	1,700	1.7500	2.0000
	M	1,100	2,200		
	H	1,400	2,800		
	W	2,500	5,000		
06	L	1,250	2,500	2.2500	2.7500
	M	1,800	3,750		
	H	2,500	5,500		
	W	4,000	8,000		
09	L	2,250	5,750	3.0000	4.2500
	M	3,750	8,500		
	H	5,500	12,000		
	W	8,500	20,000		
11	L	5,000	12,000	4.0000	4.2500
	M	9,000	16,500		
	H	12,000	25,000		
	W	16,000	30,000		

*Larger bores may require flat keys (supplied with unit).

FIGURE 3

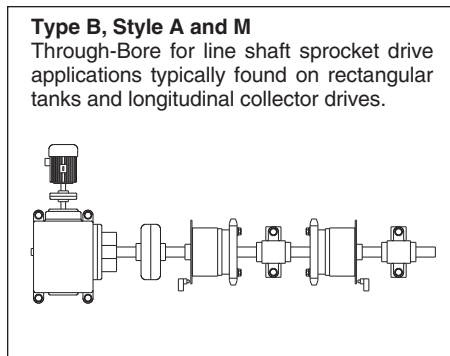


FIGURE 4

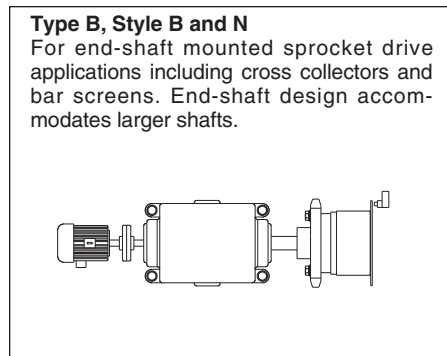
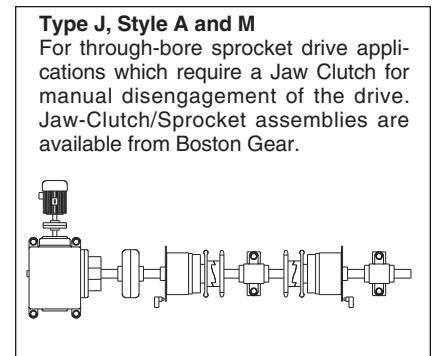


FIGURE 5



WOR SERIES PART NUMBERING SYSTEM

<p>WOR</p> <p>Series</p> <p>Wastewater Overload Release Clutch</p>	<p>05</p> <p>Size</p> <p>05 06 09 11</p>	<p>A</p> <p>Style</p> <p>A = Automatic Reset Through Bore B = Automatic Reset End Shaft M = Manual Reset Through Bore N = Manual Reset End Shaft</p>	<p>B</p> <p>Type</p> <p>B = Basic Bolt Pattern J = Jaw</p>	<p>-</p>	<p>L</p> <p>Torque Range</p> <p>L = Light M = Medium H = Heavy W = Extra Heavy</p>	<p>P16</p> <p>Unit Bore</p> <p>P = Bored to Size (in 1/16") M = Metric Bored to Size (mm)</p>
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HOW TO ORDER

When ordering a WOR Series H1900 Overload Clutch for Wastewater Treatment applications, please include code letters/numbers for series, size, style, type, torque range, and bore size.

Example:

Required size, 05 WOR Series H1900 Overload Clutch, automatic reset, through-bore mounting, basic type, medium torque range, with a one inch bore:

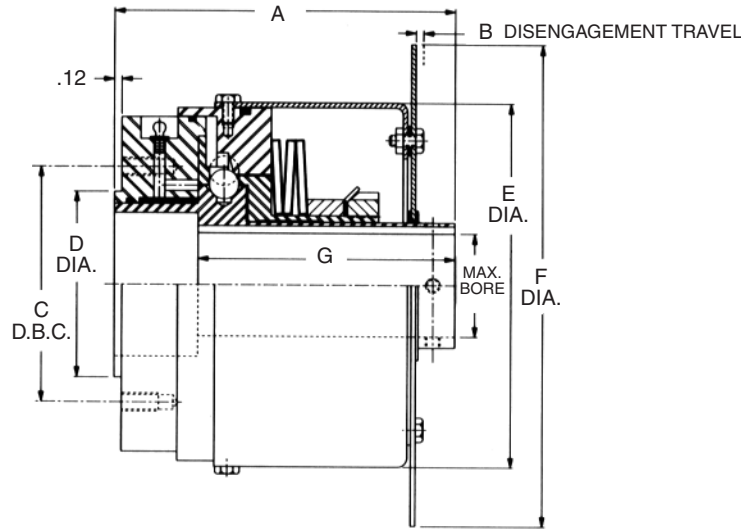
WOR 05 A B — M P16

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H1900 OVERLOAD CLUTCHES

WOR SERIES STYLE A AND M THROUGH-BORE

TYPE B BASIC SPROCKET MOUNTING



ALL DIMENSIONS IN INCHES

Clutch Size	A	B	C	D +.000/-0.002	E	F	G	Mounting Holes			Min. H78 Sprocket
								No.	Thread	Depth	
05	5.76	.13	4.000	3.123	6.19	8.19	4.50	6	5/16-18	0.75	9 Tooth
06	7.45	.17	4.875	4.000	7.62	9.62	5.25	8	1/2-13	1.12	9 Tooth
09	9.14	.19	4.875	4.000	9.65	11.62	6.12	8	1/2-13	1.25	9 Tooth
11	10.00	.19	6.500	5.500	9.65	11.62	7.00	8	1/2-13	1.25	11 Tooth

RATINGS

Clutch Size	Torque Code	Torque Range (Lb. In.)		Max. RPM	Weight (Lbs.)
		Min.	Max.		
05	L	850	1,700	50	24
	M	1,100	2,200		
	H	1,400	2,800		
	W	2,500	5,000		
06	L	1,250	2,500	50	40
	M	1,800	3,750		
	H	2,500	5,500		
	W	4,000	8,000		
09	L	2,250	5,750	50	80
	M	3,750	8,500		
	H	5,500	12,000		
	W	8,500	20,000		
11	L	5,000	12,000	50	87
	M	9,000	16,500		
	H	12,000	25,000		
	W	16,000	30,000		

CLUTCH BORES

Clutch Size	Bores (inch)		
	Min.	Max. (1)	Max. (2)
05	0.6250	1.6250	1.7500
06	0.6250	2.1250	2.2500
09	1.0000	2.7500	3.0000
11	1.0000	3.7500	4.0000

Refer to Page 84 for a complete list of bore codes.

- (1) Square Key
- (2) Flat Key

Clutches are shipped set for the minimum torque value of the specified range.

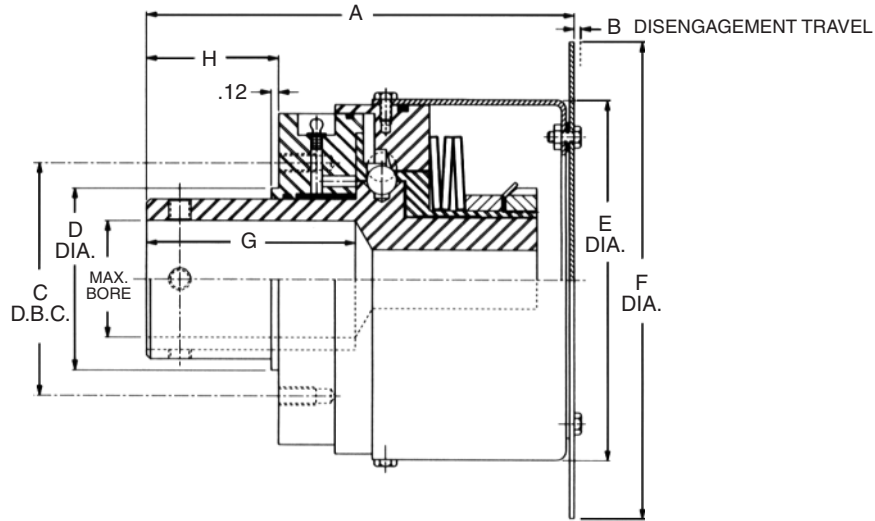
Refer to Page 45 for ordering information.

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H1900 OVERLOAD CLUTCHES

WOR SERIES STYLE B AND N END-SHAFT

TYPE B BASIC SPROCKET MOUNTING



ALL DIMENSIONS IN INCHES

Clutch Size	A	B	C	D +.000/-0.002	E	F	G	H	Mounting Holes			Min. H78 Sprocket
									No.	Thread	Depth	
05	7.00	0.13	4.000	3.123	6.19	8.19	3.30	2.09	6	5/16-18	0.75	9 Tooth
06	9.04	0.17	4.875	4.000	7.62	9.62	4.69	2.56	8	1/2-13	1.12	9 Tooth
09	10.75	0.19	6.500	5.500	9.65	11.62	5.88	3.00	8	1/2-13	1.25	11 Tooth
11	11.44	0.19	6.500	5.500	9.65	11.62	5.88	3.00	8	1/2-13	1.25	11 Tooth

RATINGS

Clutch Size	Torque Code	Torque Range (Lb. In.)		Max. RPM	Weight (Lbs.)
		Min.	Max.		
05	L	850	1,700	50	25
	M	1,100	2,200		
	H	1,400	2,800		
	W	2,500	5,000		
06	L	1,250	2,500	50	42
	M	1,800	3,750		
	H	2,500	5,500		
	W	4,000	8,000		
09	L	2,250	5,750	50	83
	M	3,750	8,500		
	H	5,500	12,000		
	W	8,500	20,000		
11	L	5,000	12,000	50	87
	M	9,000	16,500		
	H	12,000	25,000		
	W	16,000	30,000		

CLUTCH BORES

Clutch Size	Bores (inch)	
	Min.	Max. (1)
05	0.6250	2.0000
06	0.6250	2.7500
09	1.0000	4.2500
11	1.0000	4.2500

Refer to Page 84 for a complete list of bore codes.
(1) Square Key

Clutches are shipped set for the minimum torque value of the specified range.

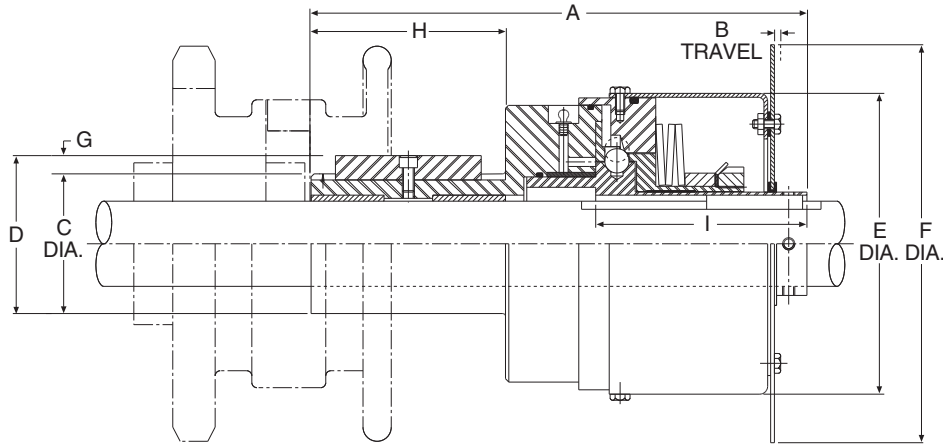
Refer to Page 45 for ordering information.

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H1900 OVERLOAD CLUTCHES

**WOR SERIES
STYLE A AND M THROUGH-BORE**

**TYPE J
JAW CLUTCH ADAPTER**



ALL DIMENSIONS IN INCHES

Clutch Size	A	B	C	D +.000/-0.002	E	F	G	H	I
05	10.20	.13	2.875	3.250	6.19	8.19	.38	4.00	4.50
06	12.25	.17	3.500	3.875	7.62	9.62	.38	4.50	5.25
09	14.62	.19	4.000	4.500	9.65	11.62	.50	5.00	6.12
11	15.87	.19	5.000	5.500	9.65	11.62	.50	5.50	7.00

RATINGS

Clutch Size	Torque Code	Torque Range (Lb. In.)		Max. RPM	Weight (Lbs.)
		Min.	Max.		
05	L	850	1,700	50	31
	M	1,100	2,200		
	H	1,400	2,800		
	W	2,500	5,000		
06	L	1,250	2,500	50	50
	M	1,800	3,750		
	H	2,500	5,500		
	W	4,000	8,000		
09	L	2,250	5,750	50	96
	M	3,750	8,500		
	H	5,500	12,000		
	W	8,500	20,000		
11	L	5,000	12,000	50	119
	M	9,000	16,500		
	H	12,000	25,000		
	W	16,000	30,000		

CLUTCH BORES

Clutch Size	Bores (inch)		
	Min.	Max. (1)	Max. (2)
05	0.6250	1.6250	1.7500
06	0.6250	2.1250	2.2500
09	1.0000	2.7500	3.0000
11	1.0000	3.7500	4.0000

Refer to Page 84 for a complete list of bore codes.

- (1) Square Key
- (2) Flat Key

Clutches are shipped set for the minimum torque value of the specified range.

Refer to Page 45 for ordering information.

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H1900 OVERLOAD CLUTCHES

GENERAL INFORMATION

SUGGESTED SPECIFICATIONS FOR WATER AND WASTEWATER TREATMENT APPLICATIONS

LIMIT SWITCH LAYOUT

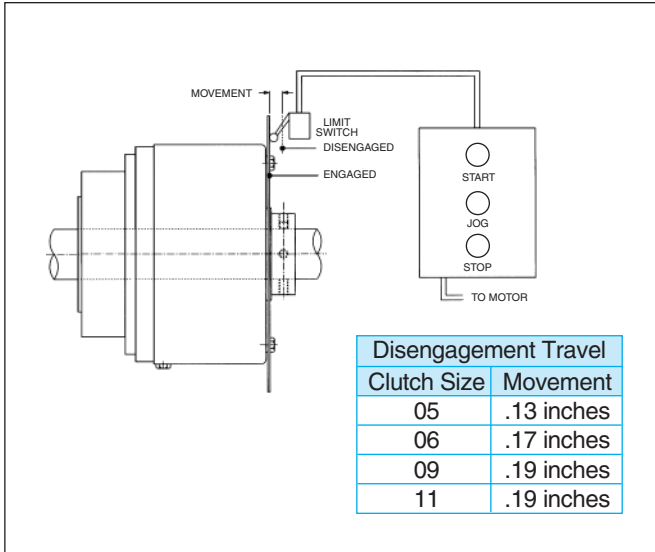


FIGURE 6
TORQUE OVERLOAD DETECTION

The WOR Series H1900 is offered with an automatic reset (Style A/B). Because of this feature, it is important that the drive be shut down immediately upon a torque overload condition. Figure 6 utilizes a single limit switch to detect an overload. The switch should be able to operate within the disengagement travel of the clutch. Upon an overload, an oversized stainless steel plate attached to the cover will move to actuate the limit switch and shut down the drive.

Torque Adjustment Wrench

Standard bearing nuts are used to adjust the spring load which controls the release torque of the clutch. These nuts are slotted and can easily be turned using a common, commercially available hook style spanner wrench. Refer to the table at bottom of this page for wrenches which are compatible with Boston Gear's torque overload release clutches.

Overload release clutches shall be installed to provide positive protection against damaging jams to the drives. They are to be located on the output sides of speed reducers, or as near as possible to the potential source of the overload so that the drive components are adequately protected.

The clutches shall be a ball detent type which when an overload occurs, the detent balls will roll free from their seat against pre-set spring pressure, completely disengaging the drive. Springs are to be a precision Belleville design conforming to spec. DIN-2092 and DIN-2093.

Resetting shall be a simple manual push back re-engagement (or automatic reset) and torque values will remain constant within plus or minus 10% after each disengagement or re-engagement.

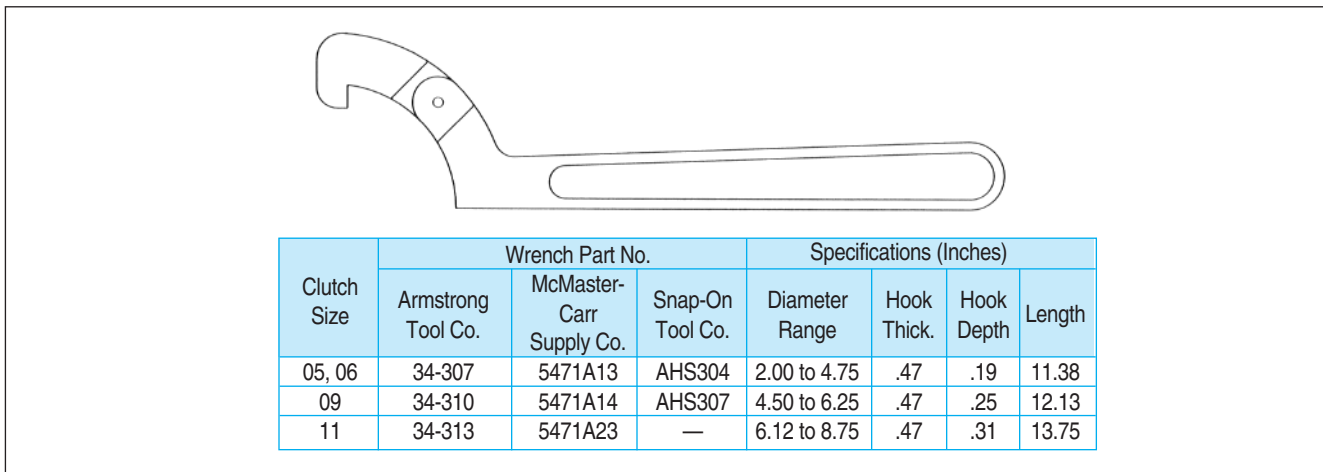
All clutches shall be fully adjustable through a wide torque range to meet varying conditions and include a maximum torque limit stop to prevent adjustment beyond designed torque values. A circular plate is to be incorporated in the cover as a means to operate a limit switch to annunciate and/or stop the drive.

The clutches shall be completely sealed suitable for outdoor installations, including a stainless steel cover, electroless nickel plated external parts, and an external grease fitting for packing the units.

Chrome alloy steel detent balls shall be hardened to 60 Rc and all major internal components hardened to 50 Rc minimum for long life.

The WOR Series H1900 Overload Release Clutches shall be manufactured by Boston Gear, Quincy, Massachusetts 02171.

TORQUE ADJUSTMENT WRENCH



For application assistance call 704-688-7324 or visit us at www.centricclutch.com

