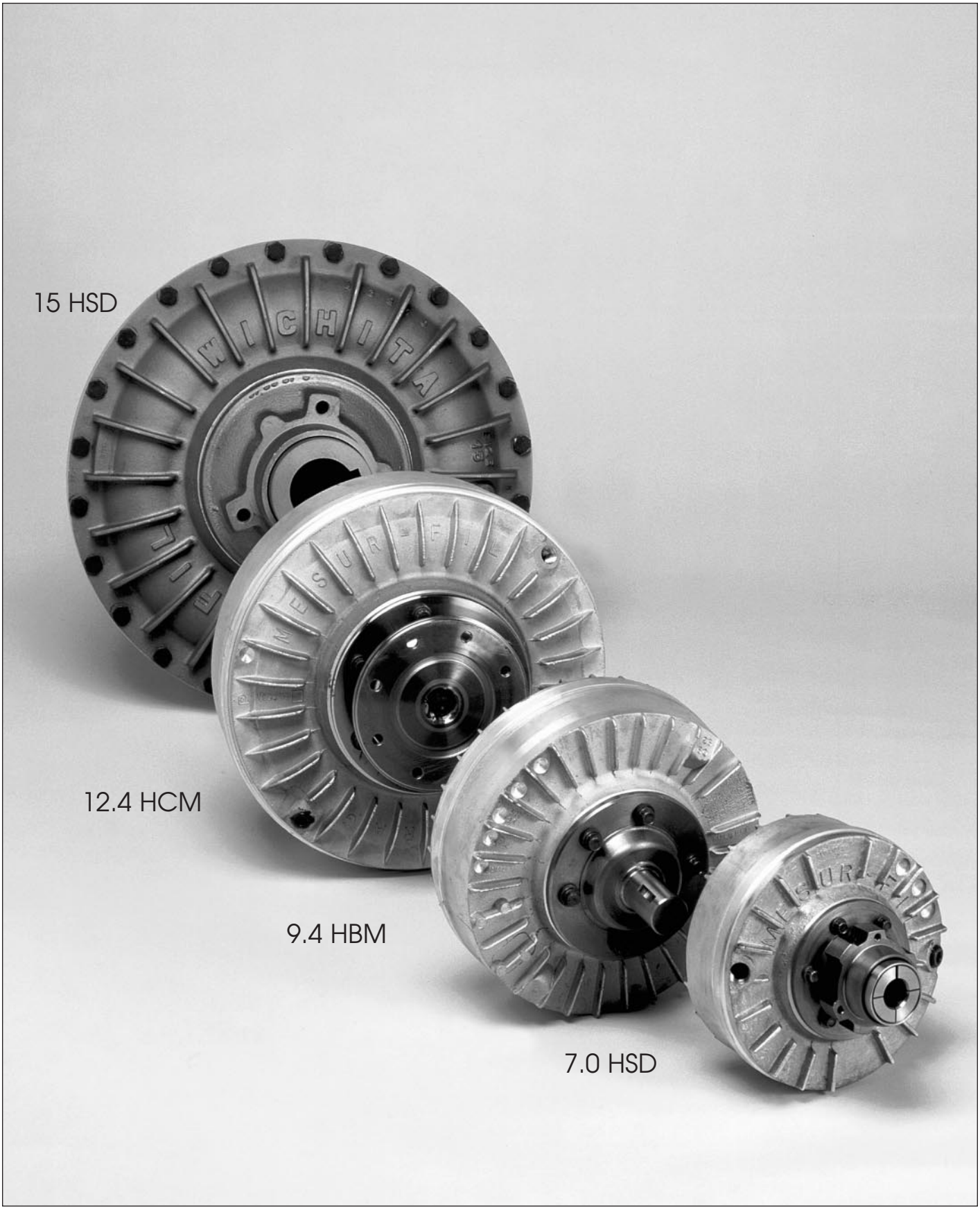
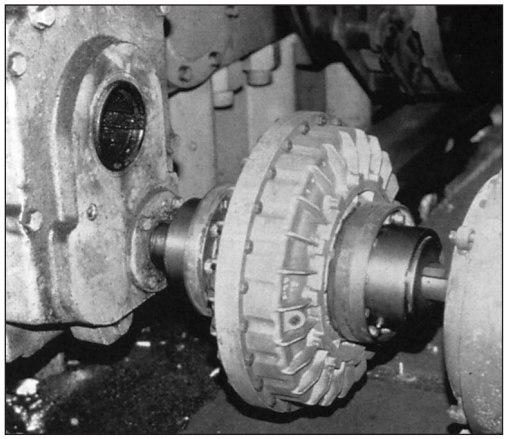
Mesur-Fil Fluid Couplings



Formsprag Mesur-Fil® Fluid Couplings deliver reliable smooth power transmission. To consistently deliver, we select only from the highest quality materials. Our manufacturing and product assembly are completed under the most exacting guidelines and established procedures. The result is unquestioned consistent product dependability.

Mesur-Fil Fluid Couplings are rated for motors up to 2,500 hp. They have earned a reputation for providing smooth, soft starts while reducing current draw on the motor by 33%.

Mesur-Fil Fluid Couplings are ideally suited for direct drive applications between electric motors and gear boxes.



Typical Applications

Bulk Material Handling Equipment and Mining Related Industries:

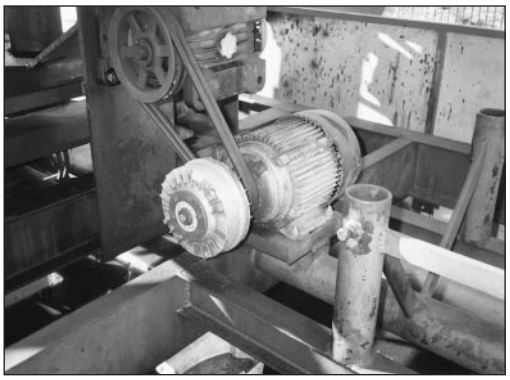
- Conveyors of all types
- Crushers
- Excavators
- Fans
- Mills
- Mixers
- Pumps
- Screening Plants

Petrochem and Chemical Processing:

- Agitators
- Blowers/Fans
- Centrifuges
- Compressors
- Mixers
- Pumps

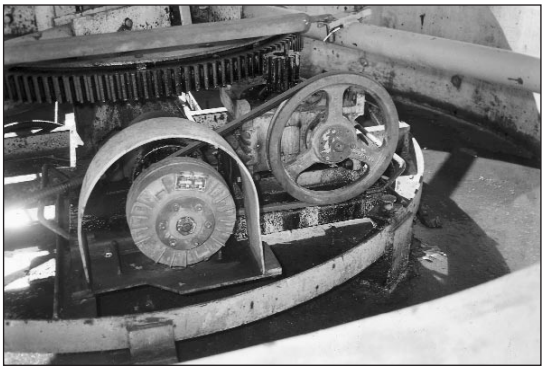
Other Applications include:

- Amusement park rides
- Construction
- Machine tools
- Oil Field
- Power Generation
- Ski resort chair lifts



Mesur-Fil 7.0 HSD allows shock-free acceleration on large inertia loads.

Picture Courtesy of Torpey Denver, Inc.



Mesur-Fil 7.0 HSD on amusement park ride, "Speed Boats," giving cushioned, smooth starts.

Picture Courtesy of Torpey Denver, Inc.

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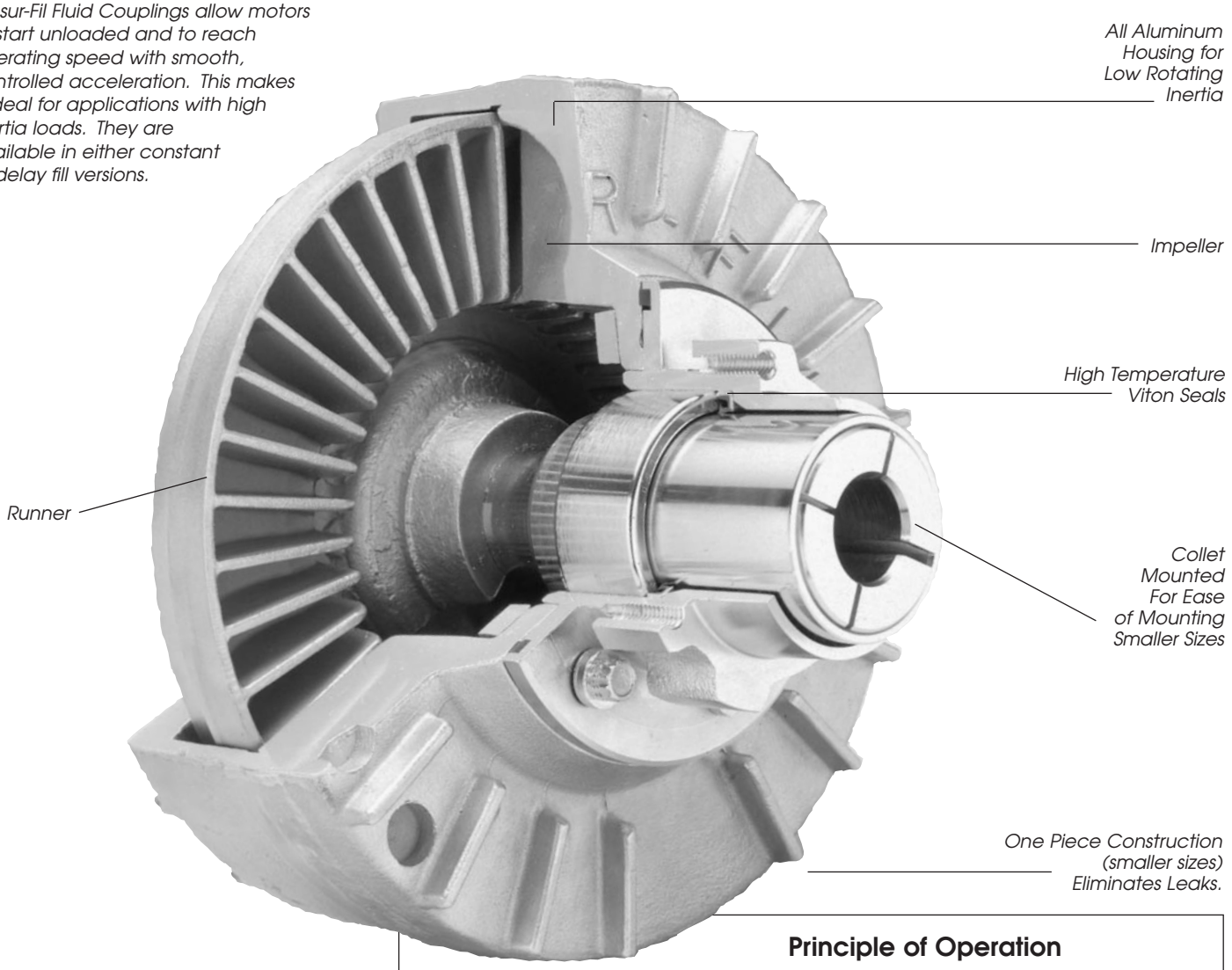
Design Avantages

Mesur-Fil Fluid Couplings allow motors to start unloaded and to reach operating speed with smooth, controlled acceleration. This makes it ideal for applications with high inertia loads. They are available in either constant or delay fill versions.

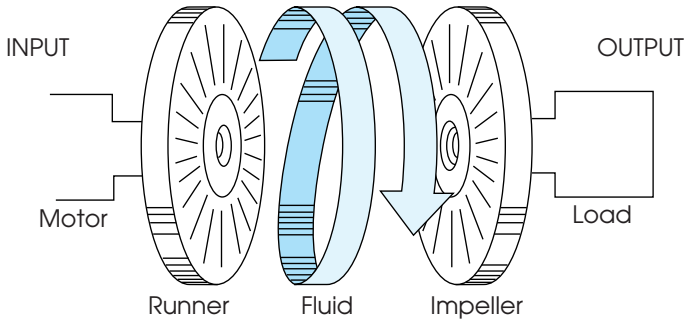


Benefits

Mesur-Fil Fluid Couplings offer several advantages:

- Reduced energy consumption
- Jam/overload protection
- Shock load cushioning
- No metal-to-metal contact
- Wide range of available mounting options
- High temperature Viton seals
- Available from over 700 Formsprag Authorized Distributors.

Principle of Operation



There are three primary components to Mesur-Fil Fluid Couplings:

1. Vaned runner
2. Vaned impeller
3. Fluid fill

Torque, produced by the prime mover (motor) acting on a vaned runner, is transmitted through the flow of fluid into the chambers formed by the two coupling halves. The oil (fluid) is subsequently thrown into the vaned impeller connected to the load causing it to turn. It is important to note, that as this transmission of power takes place, there is virtually no wear on the transmitting parts because there is no mechanical contact between them.

Fluid Requirements

Figure 2 reveals a typical NEMA B electric motor torque curve together with the particular operating characteristics of a specific coupling with a designated fill level. With no power supplied, all of the fluid is settled at the bottom of the coupling. Slip rate in this condition is 100% with the input free to turn. With the motor starting and increasing in speed to the breakdown point, torque builds in the coupling. As torque increases, the coupling begins to deliver the load to the motor, eventually bringing the load up to speed (refer to the load acceleration area in fig. 2.).

Figure 2. Starting Torque

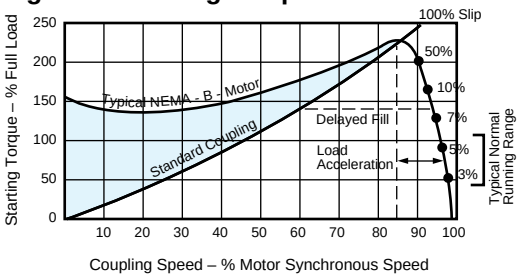


Figure 3. Start-up Burnout Protection

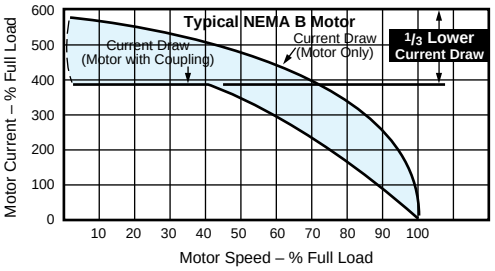


Figure 4. Jam Load Burnout Protection

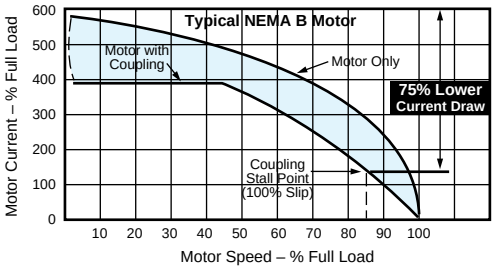
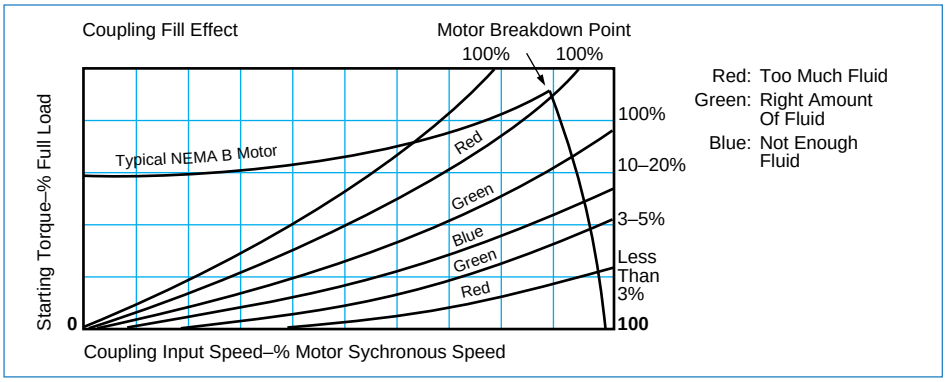


Figure 1. Motor Breakdown Points



The area on the chart between the motor torque curve and the 100% slip curve represents the excess torque available to the motor to start itself without also having to start the load. It is this operating characteristic which permits a soft start with a one-third lower current draw on the motor. (See fig.3.) (It should be noted that because the coupling torque can only be developed if the runner is turning at a slower speed than the impeller, an ideal small amount of slip of 3% to 5% is necessary).

The Mesur-Fil Fluid Coupling provides for jam load protection to the motor and other vital power system components. It is designed to allow the motor to decelerate only to its breakdown point (fig. 4). The results without the fluid coupling could be a locked rotor condition, resulting in excessive current draw and potential motor damage. Additionally, the coupling distributes the shock of an overload over a longer time span, thus reducing the possibility of damage.

Delayed Fill

Mesur-Fil Fluid Couplings, sizes 15 through 34 (30 to 1500 hp.), have an available delayed fill option restricting starting torque to 140% of full load while still ensuring low slip at full speed. The result is a softer, more gradual start which can be advantageous for applications such as belt conveyors and mixers.

The operating principles are simple. With the idle coupling (fig. 5) the purpose of the delayed fill chamber is to isolate a portion of the fluid from the main coupling. As the runner accelerates (fig. 6), the chamber attached to the runner gradually releases fluid into the main coupling through specially calibrated orifices. The fill increases proportionally with the output speed. With acceleration complete (fig. 7) at the high speed running position, almost all of the fluid has been released from the chamber into the coupling, giving the coupling high fill/low slip characteristics.

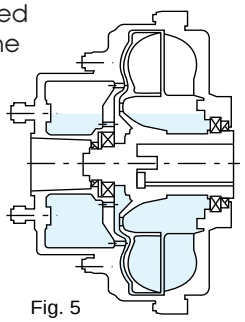


Fig. 5
Standstill

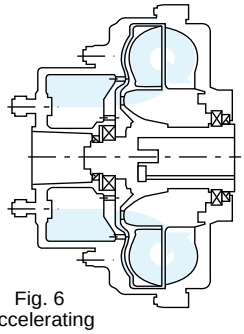


Fig. 6
Accelerating

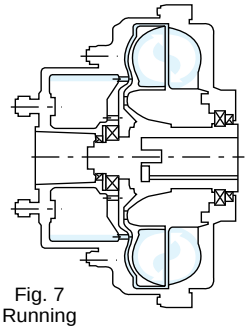


Fig. 7
Running

Mounting Types per Size

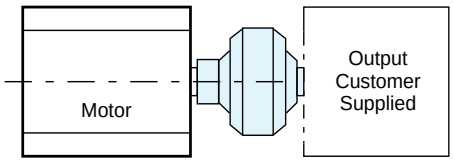
Mounting Type	Size											Mounting Application
	7.0*	9.4*	12.4*	15	17	19	21	24	27	29	34	
HC (pages 146-148)	•	•	•	•	•	•	•	•	•	•	•	Basic coupling for custom input & output
HCM (pages 150-151)	•	•	•	•	•	•	•	•	•	•	•	For use with flexible gear couplings
HCF (page 152)				•	•	•	•	•	•	•	•	Shaft to shaft with flexible output group
HCR (page 153)				•	•	•	•	•	•	•	•	Shaft to shaft with flexible output group
HBM (page 149)	•	•	•	•	•	•	•	•	•	•		Shaft to shaft applications For stub shaft input/output size 7-12.4
KBM (page 157)											•	Shaft to shaft application with bearing supported input/output shafts
HSD (pages 154-155)	•	•	•	•	•	•	•	•				Parallel, QD sheave application
KRDA (page 156)				•	•	•	•	•	•	•	•	Diesel & Gas engine flywheel application

*Modular design (See page 145)

HC Sizes 7.0-12.4 Input and output customer supplied. Sizes 15-34 Output customer supplied.

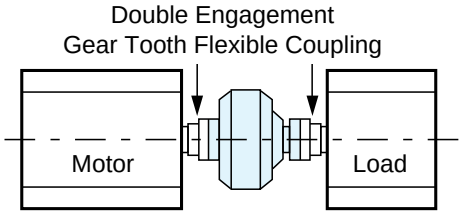
(pages 146-148)

This is a basic coupling with an input bore for direct mounting on the motor shaft end and a convenient bolt circle for customer-designed output configurations.



HCM

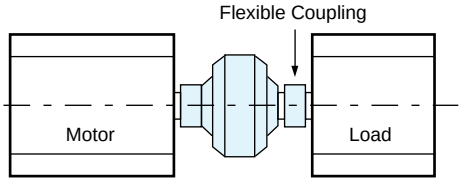
(pages 150-151)



The Model HCM Fluid Coupling is a complete unit with both input and output flanges. It is intended for installation between two halves of a double engagement gear tooth flexible coupling which is customer supplied. This arrangement provides for a wide range of input and output configurations for ease of installation.

HCF & HCR Sizes 15–34

(pages 152-153)

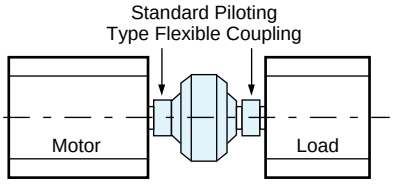


These couplings are designed to mount directly on the motor shaft when mounting space is limited. The output is connected to the load by a flexible coupling provided with the fluid coupling. The HCF flexible coupling consists of a set of rubber block elements enclosed within a bored and keyed output member. The HCR flexible coupling consists of a reinforced rubber element bolted to a bored and keyed output member. This arrangement allows for easy accessibility, removal and quick replacement of the flexible element without disturbing either the input or output mounting position.

HBM Sizes 7–12.4

(page 149)

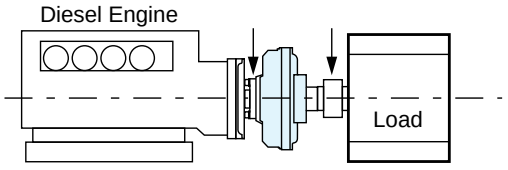
This coupling is a complete unit with straight input and output shaft. It is installed between two piloting type flexible couplings supplied by the customer.



KRDA Sizes 15–34

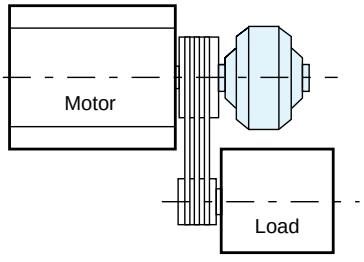
(page 156)

This coupling is designed to mount to the flywheel of an engine by means of a SAE elastomeric flange on the input side and is also designed to accept a straight shaft on the output.



HSD

(pages 154-155)



Hydro-sheave couplings are mounted to the motor shaft end and provide minimal overhung loads for parallel (belt-driven) shaft applications. The smaller sizes (7-12.4) are installed very quickly and easily utilizing a slotted collet in which no drilling or tapping is required. The slotted collet is finished bored to fit standard NEMA B motor shaft dimensions. The larger sizes (15-24) are installed with a center locating bolt that does require drilling and tapping to ensure proper mounting.

The Model HSD Fluid Coupling consists of a basic fluid coupling, input and output group, and a standard customer supplied QD type sheave. The sheave is mounted on a coupling that has been installed on the end of a driveshaft.

Fill Levels (NEMA B Motors)

The Quick Selection Chart (fig. 8) provides the correct size coupling and fill level for any standard NEMA B motor within the Mesur-Fil range. It also provides the slip rate that can be anticipated at normal operating speed. Having the correct amount of oil in the coupling is extremely critical to ensure safe and proper operation. Figure 9 shows the effects of either too much or too little fluid. With an optimum amount of fluid, the breakdown point of the motor with the 100% slip line of the coupling provide the best combination of soft start with slip rate at normal speed. With too much fluid (red area), the slip rate is lower and the start is harder. With too little fluid (blue area), the start will be softer but the slip rate will be much higher. This can cause heat dissipation problems, and, in extreme situations, the coupling may completely fail to move the load.

A choice of fluids is also available. In a normal environment, petroleum oil is the best fluid to use. For hazardous conditions such as those encountering dust, paint spray, etc., a special fire-resistant fluid may be required.

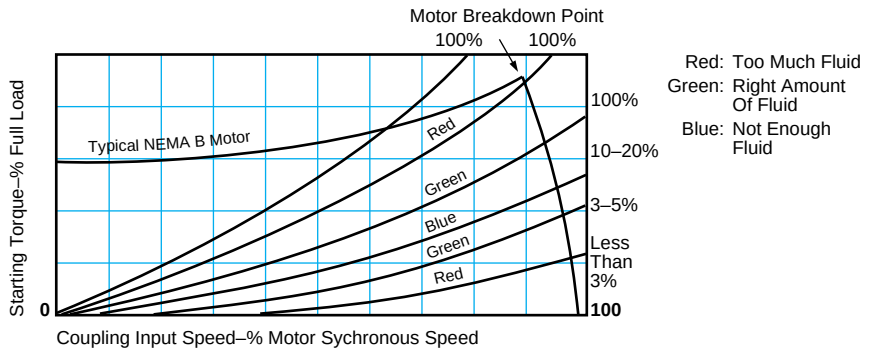
Delay chamber is recommended for the following applications:

Overland conveyors
Blowers/Fans
Mixers
Crushers
Excavators
Mills
Large inertia drives
Centrifuges

Figure 8 Quick Selection Chart

HP	1200 RPM			1800 RPM			HP	KW
	Cplg. Size	Fill No.	% Slip	Cplg. Size	Fill No.	% Slip		
1/2	7.0	12	6	7.0	8	3	1/2	0.38
3/4	9.4	8	3	7.0	8	4	3/4	0.56
1	9.4	8	3	7.0	9	4	1	0.75
1 1/2	9.4	8 1/2	3	7.0	11	5	1 1/2	1.1
2	9.4	9	4	7.0	12	6	2	1.5
3	9.4	10	5	9.4	8	2	3	2.2
5	9.4*• or 12.4	12 or 7	7 or 3	9.4	8 1/2	3	5	3.8
7 1/2	12.4	8	2 1/2	9.4	9	3	7 1/2	5.6
10	12.4	9	4	9.4	10	4 1/2	10	7.5
15	12.4	11	5	9.4+ or 12.4	12 or 7	6 1/2 or 3	15	11.3
20	12.4*• or 15	11 1/2 or 2	7 or 3 1/2	12.4	8	2 1/2	20	15.0
25	12.4*• or 15	12 or 2	7 or 5	12.4	8 1/2	3	25	18.8
30	15	1	4 1/2	12.4	9	3 1/2	30	22.5
40	15	0	5 1/2	12.4	10	4	40	30.0
50	17	1 1/2	4	12.4	11	5	50	37.5
60	17	1	4	12.4 or 15*	11/3 or 6/3	11/3 or 6/3	60	45.0
75	19	2	4 1/2	15	2	3 1/2	75	56.3
100	21	1/2	3 1/2	15	0	3 3/4	100	75
125	21	1 1/2	4 1/2	17	2	3	125	94
150	24	2	2 1/2	17+	2	4	150	113
200	24	2	3 1/2	19+*	2	3 1/2	200	135
250	24	1	4	19+* or 21*	0 or 2	3 1/2 or 2	250	188
300	27	1		21+*	2	3	300	225
350	27	0		21+*	1	3	350	263
400	29	1		24	3		400	300
450	29	1		24	2		450	338
500	29	1		24	2		500	375
600	29	0		27	2		600	450
700	29	0		27	1		700	525
800	29	0		27	0		800	600
900	34	1						
1000	34	1						
1250	34	0						
1500	34	0						
1650	D34	0						
1750	D34	0						
2000	D34	0						
2500	D34	0						

Figure 9 Coupling Fill Effect



* In these applications, coupling will develop stall torque somewhat higher than motor breakdown torque.

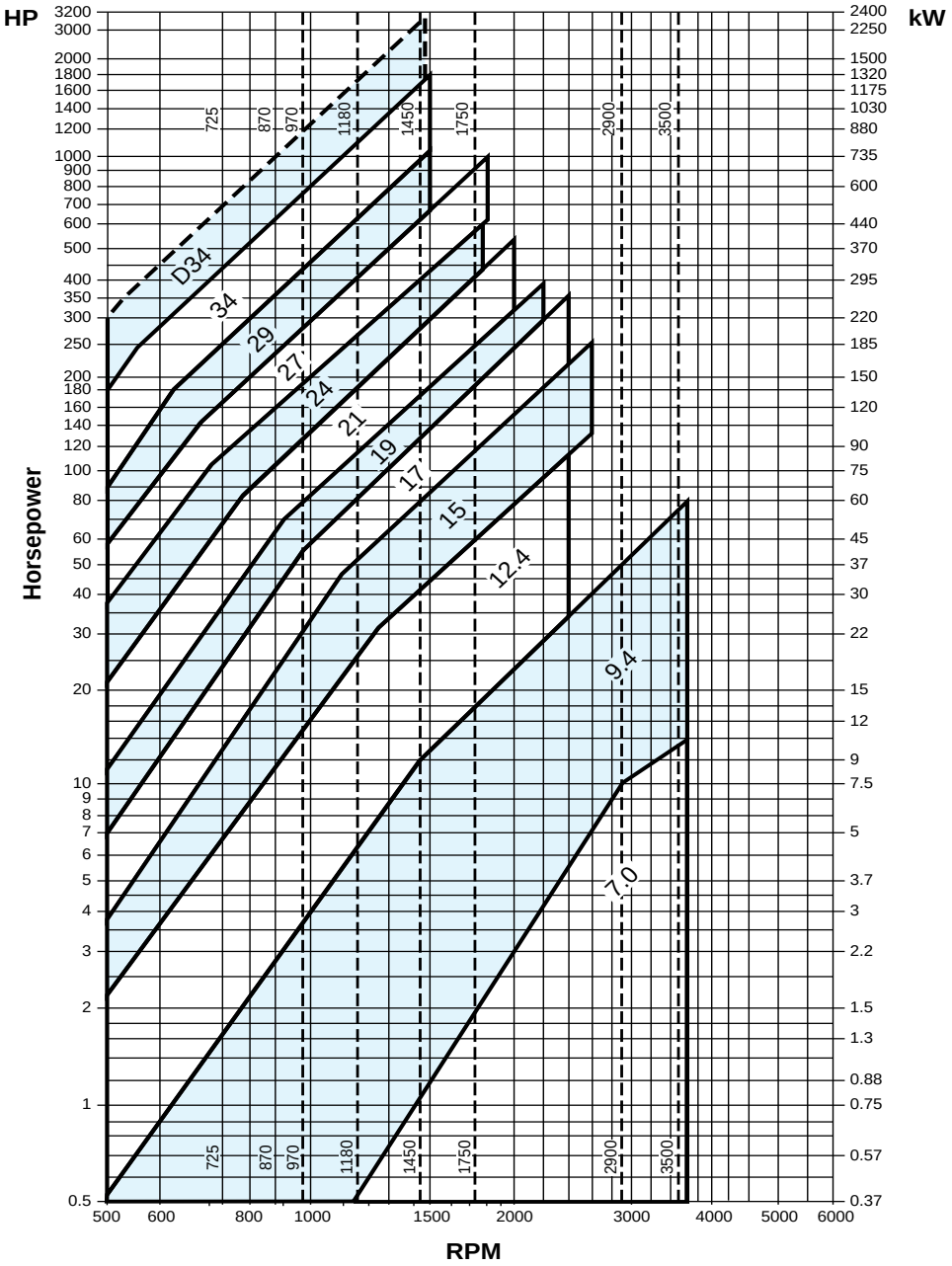
+ In these applications, frequent starts or overloads may overheat coupling. Use only for loads at or below rated torque of motor with infrequent starts.

• Caution! 7% or higher slips may cause overheating if coupling is cycled too rapidly.

For minimum operating temperature below -10°F, consult Warner Electric.

Note: For vertical mounting order unit with both the standard and optional fill plugs on both sides of the unit.

Input speed vs. Horsepower Graph



Fluid quantities (fluid ozs.)

Fluid Quantities (U.S. Fluid Ounces) Fill Number						
Size	7	8	9	10	11	12
7.0		18.5	21	23	25.5	27.6
9.4		43	49	54	60	65
12.4	87	100	112	125	138	150

Fluid Quantities (U.S. Quarts) Fill Number					
Size	0	1	2	3	4
15	8	7.6	7.0	6.3	5.7
17	12.4	11.5	10.6	9.6	8.7
19	15	14	13	11.8	10.6
21	20	18.8	17.3	15.8	14.3
24	30	28	26	23.9	21.7
27	47	43.3	40.2	36.5	32.8
29	52	48.4	44.7	40.7	36.5
34	87.2	81	74.6	70	66

Delayed Fill			
Size	2	3	4
15	9.1	8.1	6.8
17	14.4	13.5	12.4
19	17.2	16.1	14.8
21	24.3	22.5	20.4
24	33	30.2	27.5
27	52.8	49.1	45.4
29	66.6	62.3	57
34	91.1	84.5	78.6

Fluid Recommendation

OIL: SAE 10W (Spec. MIL-L-2104 B)

Chevron:	Hydraulic Oil EP 32	Shell:	Tellus 32
Esso:	Nuto H 32	Texaco:	Rando HD 32
Mobil:	DTE 24	Total:	Azolla ZS 32

FIRE RESISTANT FLUID

Fyrquel: 220

Overload Protection

Fusible plug

In overload conditions, as the slip increases and the oil temperature rises, seals become damaged and begin to leak. In order to avoid this damage, in critical applications, it is advisable to install a fusible plug instead of a solid plug.
Overload protection. For sizes 7.0 to 12.4 a 250°F fusible plug is available only as an option. For sizes 15 to 34 a 290°F fusible plug is standard. (A 250°F or 350°F fusible plug is available as an option.)

Fusible pin For sizes 15–34

It's possible to avoid loss of oil from the unit by fitting a fusible pin. When temperature increases, reaching melting point of fusible element, a pin is released and touches a cam mounted on a relay which gives an alarm or switches off the electric motor. Like the fusible plug there are three different fusible elements. This solution needs only the replacing of the fusible element or fusible pin.

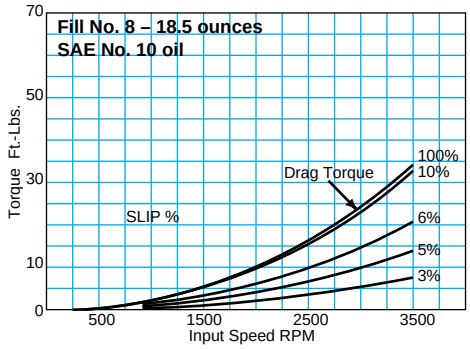
Electronic overload controller (Torque limiter) For sizes 15–34

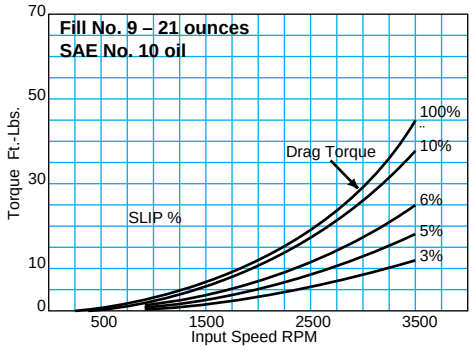
This device measures the speed of the coupling, stopping the motor or giving a signal when the preselected limit is exceeded. With this device nothing has to be replaced, and after having eliminated the cause of the overload, the transmission can run normally.

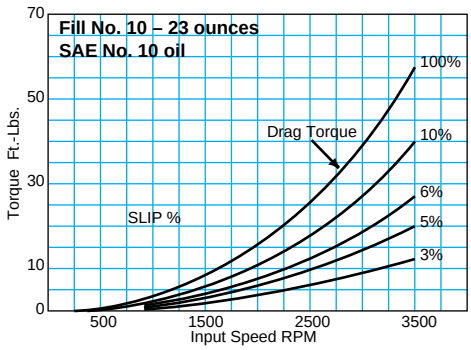
Slip Curves

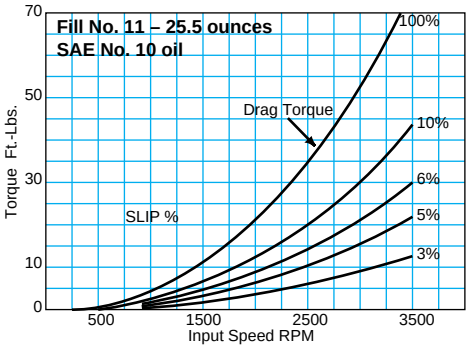
Size 7.0

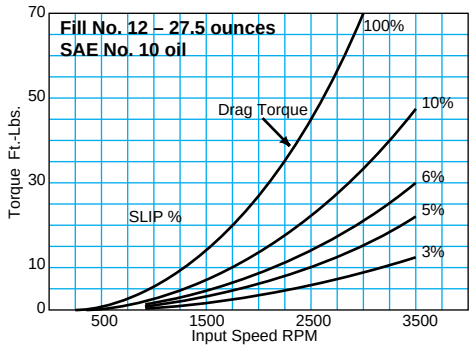
Maximum speed 3600 RPM (All configurations)





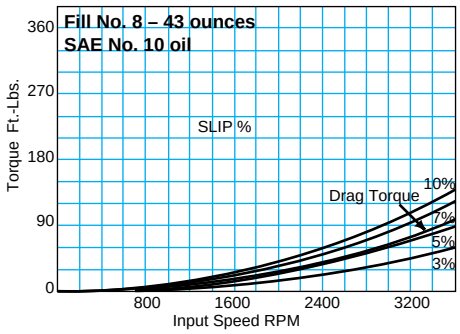


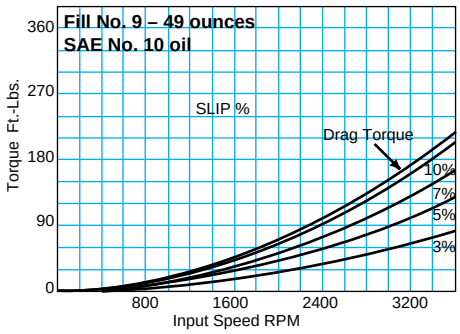


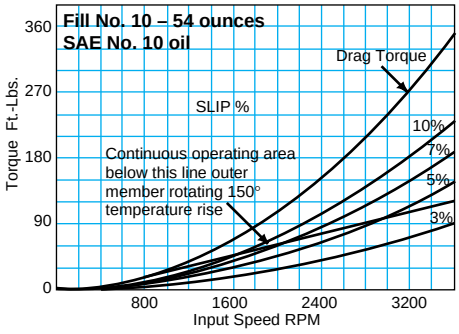


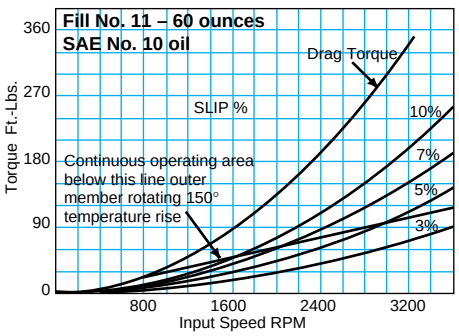
Size 9.4

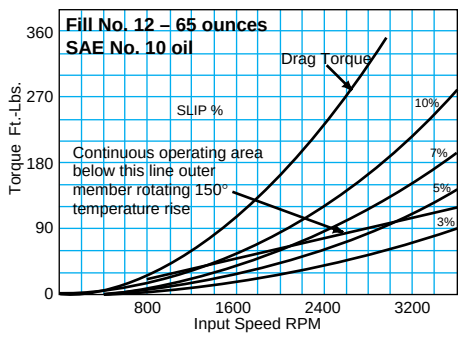
Maximum speed 3600 RPM Except HSD—Max 2600 RPM





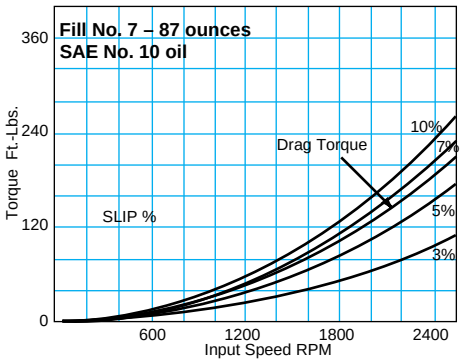


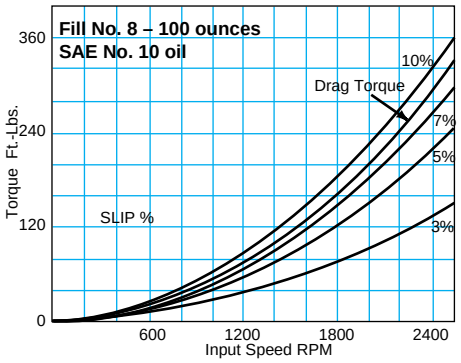


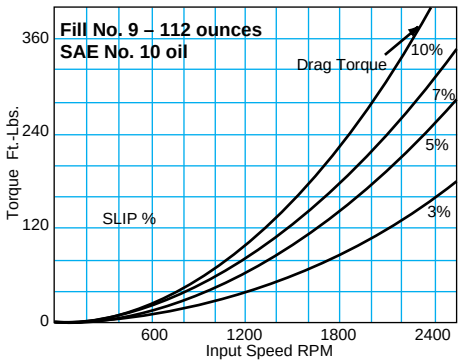


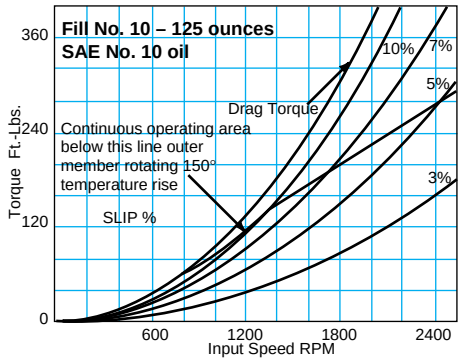
Size 12.4

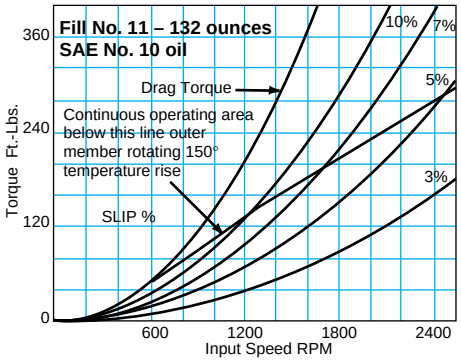
Maximum speed 2400 RPM except HSD Max 1800 RPM

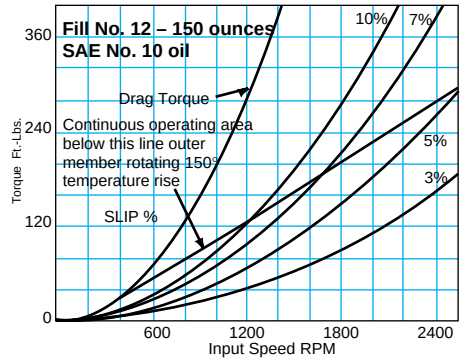






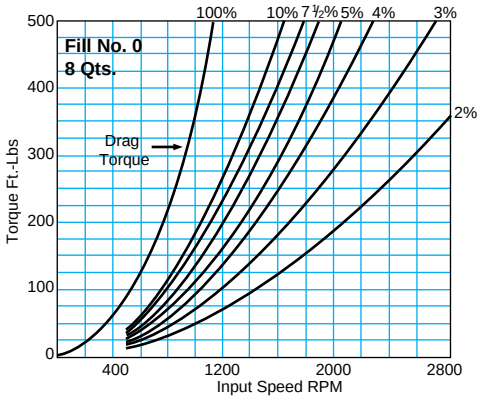


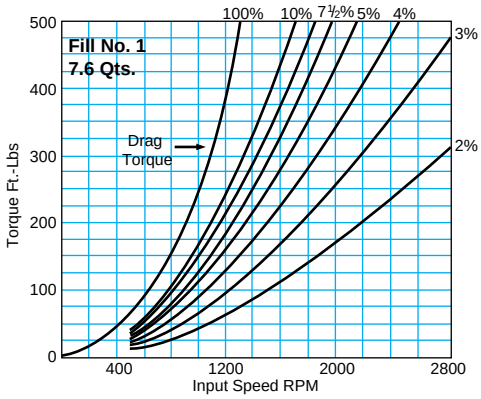


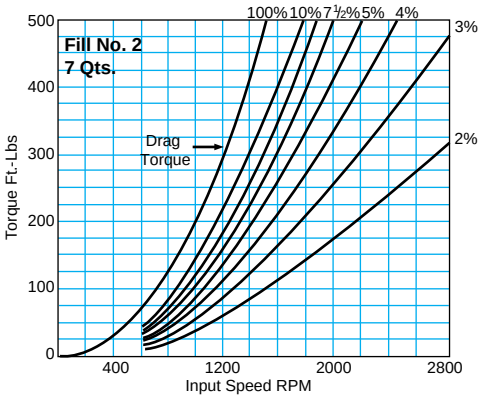


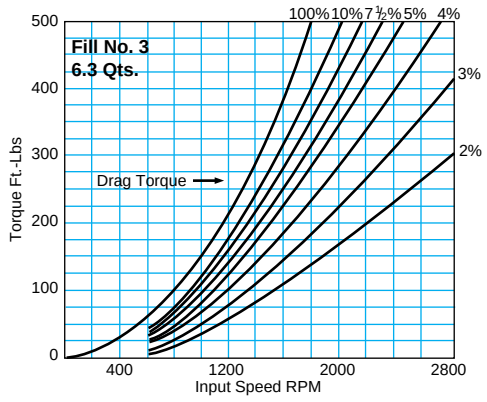
Size 15

Maximum speed 2600 RPM (All configurations)









Selection Example:

7.5 HP at 1750 RPM

Normal running torque =

$$\frac{7.5 \text{ HP} * 5250}{1750} = 22.5 \text{ lb.ft.}$$

Pullout torque is obtained at approximately 85% full motor speed and for NEMA B motors, this is approximately 200% normal rated torque.

If the pullout torque is unknown, then assume 200% of normal rating occuring at a speed of 1540 RPM, with full motor speed of 1750 RPM.

Pullout torque = 2 * 22.5 lb.ft. = 45 lb.ft.

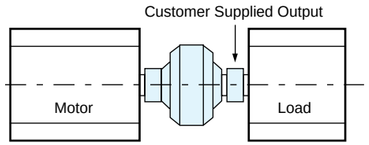
Locate the pullout torque against RPM curve to insure the point is slightly above the drag torque line.

Locate the normal torque against RPM curve to insure the point is below the 7% slip line. Ideally, plot the point between 3% and 5% slip line.

Sizes 7.0, 9.4, 12.4

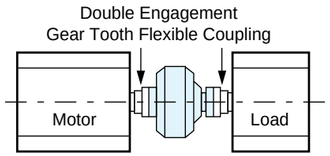
Configuration

HCF



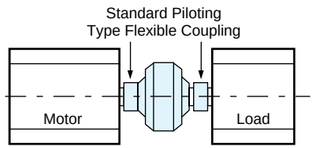
Consists of Model HC and input group. The input group is finish bored to fit standard NEMA B motor shafts. The optional output groups available (HCM, HBM) are shown on this page or the HCF output group must be supplied by the customer. Consult engineering for details.

HCM



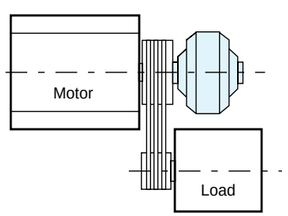
The Model HCM Fluid Coupling is a complete unit with both input and output flanges. It is intended for installation between two halves of a double engagement gear tooth flexible coupling which is customer supplied.

HBM



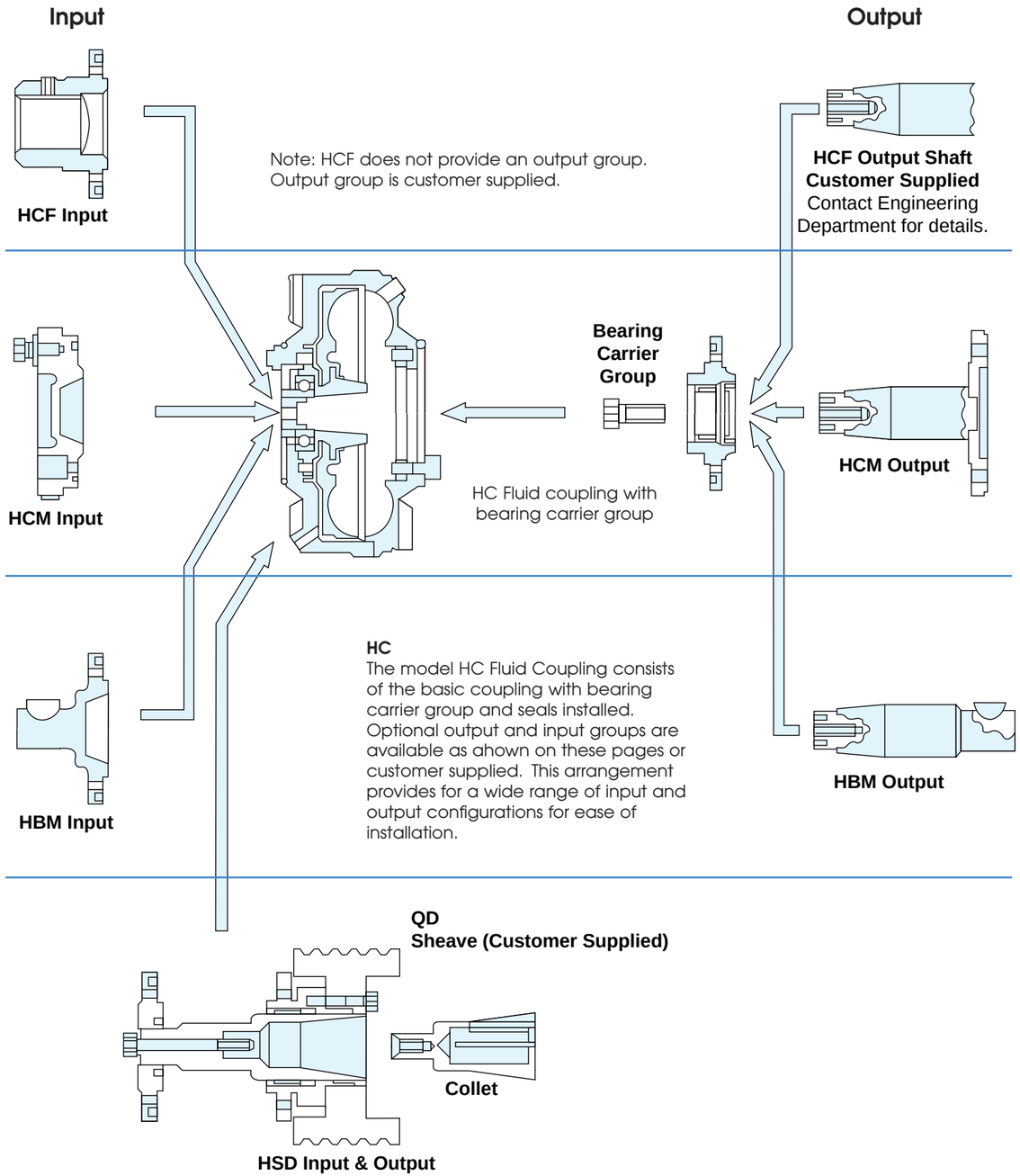
This coupling is a complete unit with a straight input and output shaft. It is installed between two piloting type flexible couplings supplied by the customer.

HSD



The Model HSD Fluid Coupling consists of a basic fluid coupling, input and output group, and a standard customer supplied QD type sheave. Hydro-sheave couplings provide minimal overhung loads for parallel (belt-driven) applications. The sheave is mounted on a coupling installed on the end of a driveshaft.

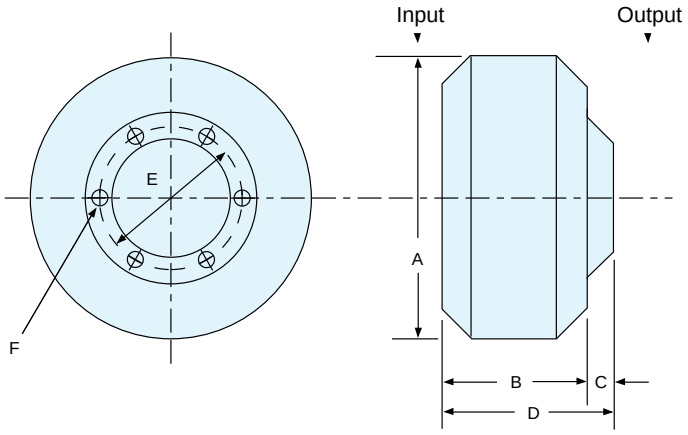
Mesur-Fil Couplings can be installed very quickly and easily utilizing a slotted collet for mounting on the motor shaft instead of the center bolt that is most commonly used with other sheave drives. Unlike the center bolt, the slotted collet requires no drilling and tapping of the end of the motor shaft. The slotted collet is finished bored to fit standard NEMA B motor shaft dimensions. Available bore sizes are found elsewhere in this brochure.



Model HC

For Custom Applications

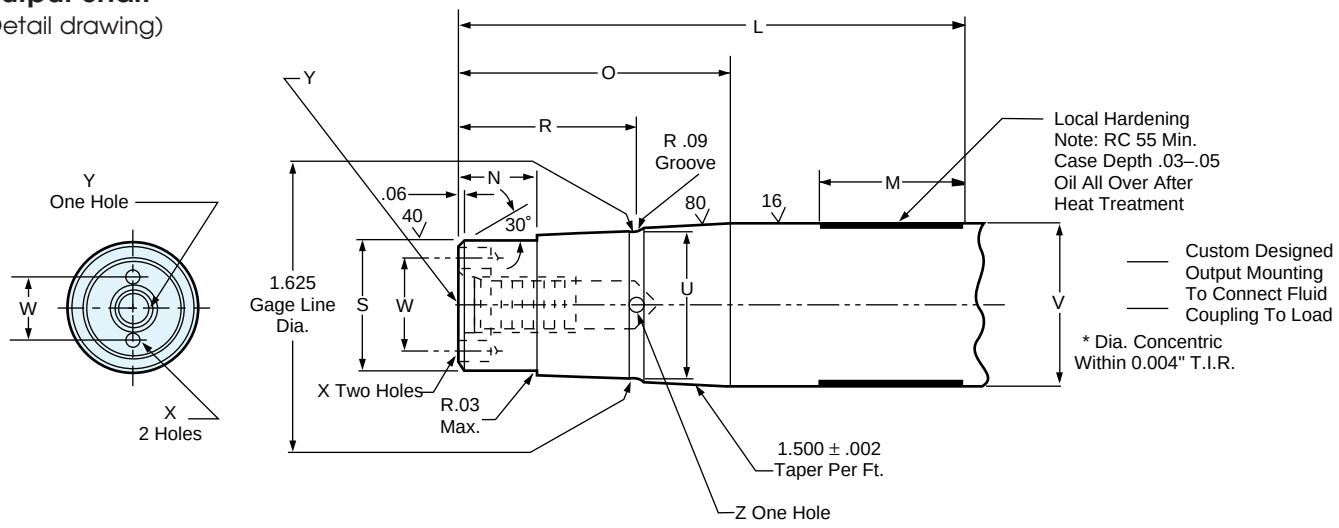
Sizes 7.0 – 12.4



Size	A	B	C	D	E	F	Wt. Lb. Less Oil	Oil US Oz. Max
7.0	7.81	3.67	.56	4.23	3.188	17/64	10.1	27.6
9.4	10.25	4.70	.77	5.47	4.250	25/64	20.5	65
12.4	13.50	5.98	.82	6.80	5.650	25/64	38.0	150

Output Shaft

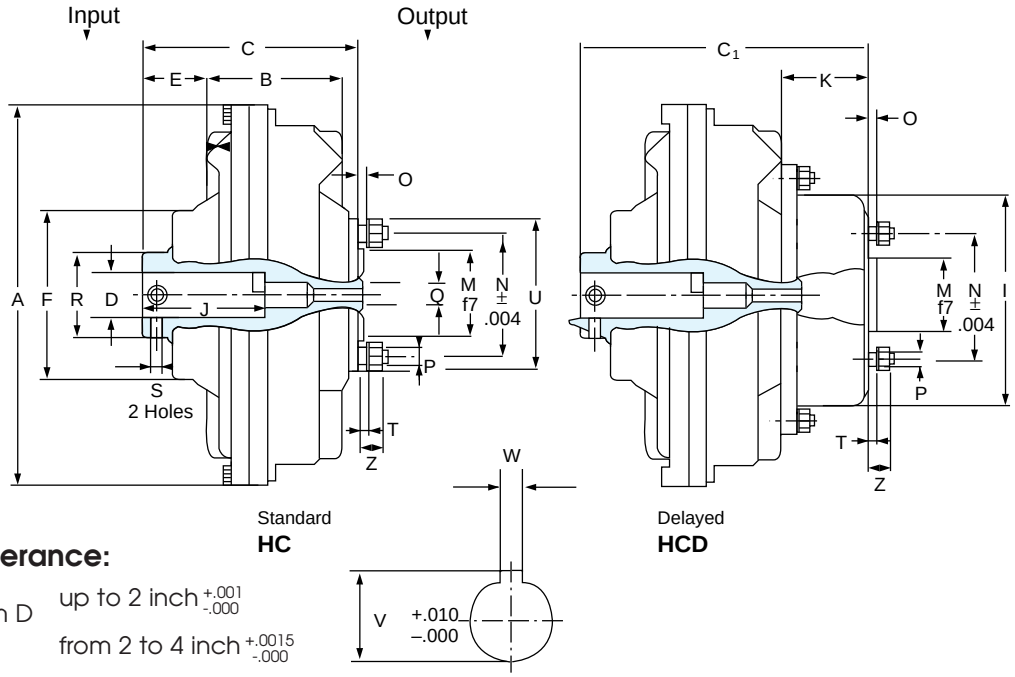
(Detail drawing)



Size	L	M	N	O	R	S	U	V	W	X	Y	Z
7.0	4.17	1.50	1.270	1.91	.60	.9845 .9839	1.124 1.116	1.250 1.249	.750	9/64 x .26	1.10	.60
9.4	5.42	1.50	1.905	2.90	.83	1.3782 1.3776	1.577 1.589	1.850 1.749	1.062	13/64 x .50	.96	.80
12.4	6.75	1.80	2.05	3.156	.90	1.5746 1.5750	1.785 1.777	2.000 1.994	1.125	13/64 x .50	.96	.90

Sizes 15 – 29

(For size 34, see next page)



Standard **HC**

Delayed **HCD**

Size	Wt. Less Oil	Oil US gal Max
15	81.5	2.020
15	▲ 90.3	▲ 2.272
17	112.4	3.090
17	▲125.6	▲ 3.487
19	127.8	3.750
19	▲141	▲ 4.227
21	191.8	5.020
21	▲214	▲ 6.076
24	231.5	7.500
24	▲253.5	▲ 8.243
27	355	11.09
27	▲394.6	▲13.21
29	472	14.531
29	▲512	▲16.645

Tolerance:

Dim D up to 2 inch $^{+.001}_{-.000}$

from 2 to 4 inch $^{+.0015}_{-.000}$

Dim W up to .500 inch $^{+.002}_{-.000}$

from .625 to 1 inch $^{+.003}_{-.000}$

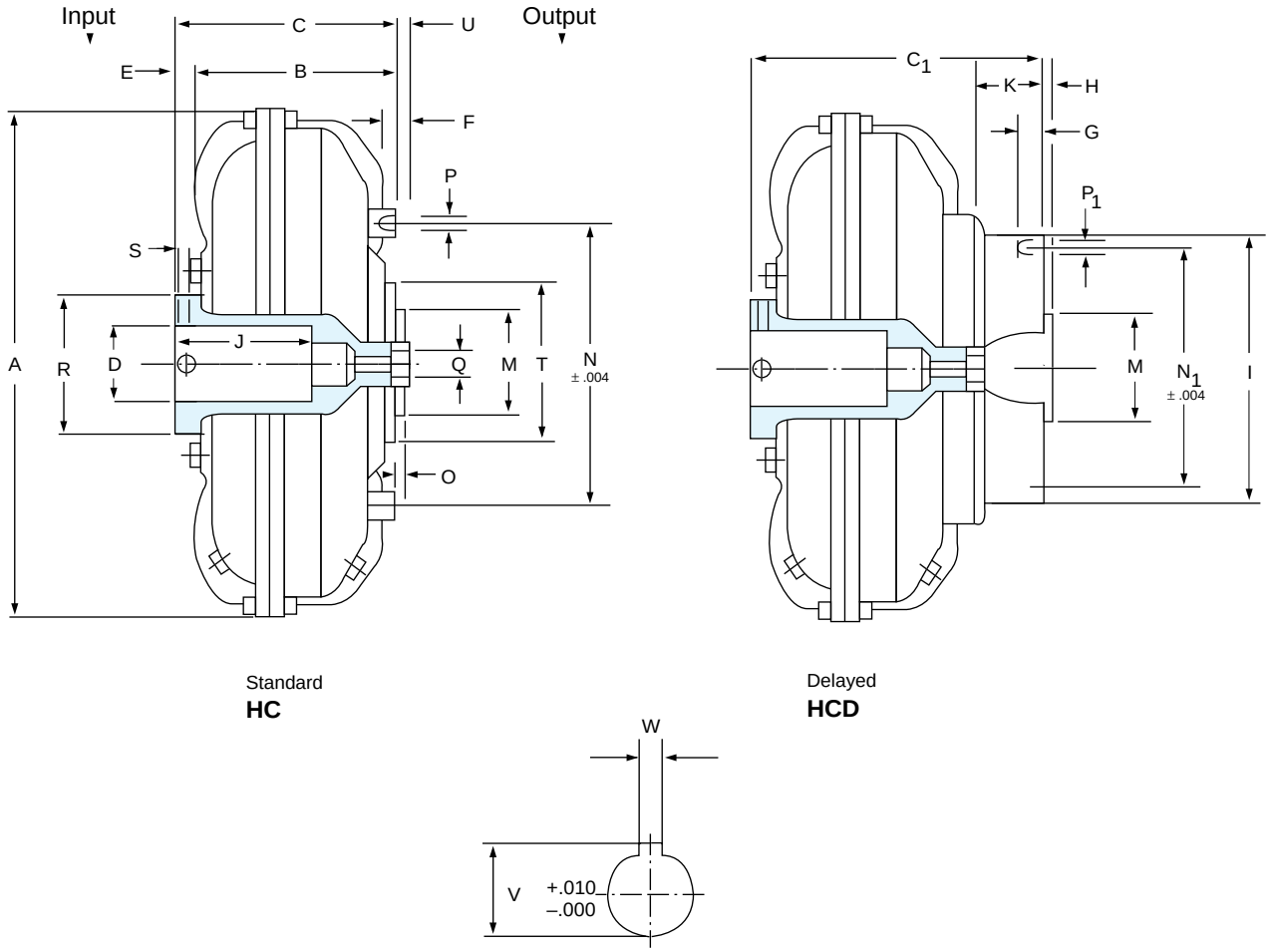
Size	D	J	W	V	A	B	C	C_1	E	F	I	K	M	N	O	P Nr.	P Dia.	Q	R	S	T	U	Z
15 ●■	2.875	7.000	.750	2.992	18.110	5.945	8.898	11.575	2.205	7.992	10.039	3.425	3.5433	3.5433	.197	8	M10	7/8 9 UNC	3.976	5/8 11 UNC	.315	6.142	.748
15	2.375	5.625	.625	2.651	18.110	5.945	8.898	11.575	2.205	7.992	10.039	3.425	3.5433	3.5433	.197	8	M10		3.976		.315	6.142	.748
15	2.125	5.000	.500	2.350	18.110	5.945	8.898	11.575	2.205	7.992	10.039	3.425	3.5433	3.5433	.197	8	M10		3.976		.315	6.142	.748
17	3.375	8.250	.875	3.635	20.472	6.693	9.764	12.913	2.441	8.858	12.992	3.779	4.9212	6.2992	.197	12	M10		4.961		.315	7.087	.748
17	2.875	7.000	.750	3.205	20.472	6.693	9.764	12.913	2.441	8.858	12.992	3.779	4.9212	6.2992	.197	12	M10		4.961		.315	7.087	.748
19 ●■	3.375	8.250	.875	3.635	22.244	7.480	9.764	12.913	1.653	8.858	12.992	3.779	4.9212	6.2992	.197	12	M10	1-1/4 7 UNC	4.961	3/4 10 UNC	.315	7.087	.748
19	2.875	7.000	.750	3.205	22.244	7.480	9.764	12.913	1.653	8.858	12.992	3.779	4.9212	6.2992	.197	12	M10		4.961		.315	7.087	.748
21 ●■	3.875	8.500	1.000	4.106	24.409	8.071	11.260	15.195	2.795	9.842	15.748	4.330	6.2992	8.9764	.197	8	M14		5.354		.551	10.039	1.181
21	3.375	8.250	.875	3.706	24.409	8.071	11.260	15.195	2.795	9.842	15.748	4.330	6.2992	8.9764	.197	8	M14		5.354		.551	10.039	1.181
24 ●■	3.875	8.500	1.000	4.106	27.953	9.015	11.260	15.195	1.850	9.842	15.748	4.330	6.2992	8.9764	.197	8	M14		5.354		.551	10.039	1.181
27 ●■	4.750	8.500	1.250	5.109	30.708	10.944	12.677	17.321	1.220	12.401	20.866	5.157	7.874	10.826	.236	8	M16	1-3/4 5 UNC	7.283	7/8 9 UNC	.551	12.125	1.299
29	5.250	9.500	1.250	5.617	33.858	12.007	13.740	18.386	1.220	13.780	20.866	5.157	7.874	10.826	.236	8	M16		8.070		.551	12.125	1.299
34	For Size 34 see page 148.																						

▲ HCD
● Max Bore
■ With Reduced Depth Keyway

Model HC

For Custom Applications

Size 34



Standard
HC

Delayed
HCD

Size	D	J	W	V	A	B	C	P Nr.	P Dia.	N	O	E	F	G	H
34	●5.938	10.438	1.500	6.346	39.370	14.881	15.24	12	M14	22.440	.236	1.732	.944	.866	.28

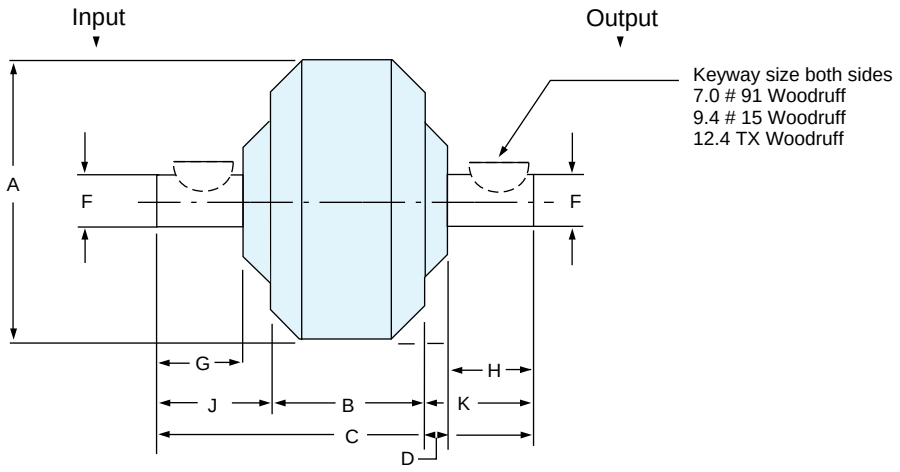
K	I	M	Q	R	S Nr.	S Dia.	T	C1	P_1 Nr.	P_1 Dia.	N_1	U	Wt. Lb Less Oil	Oil US Gal. Max.
5.157	20.866	7.874	1-3/4 5 UNC	9.84	2	1 8 UNC	12.125	20.39	10	M16	18.897	.748	743 ▲776	21.8 ▲ 24.5

▲ HCD
● Max Bore
■ With Reduced Depth Keyway

Model HBM

For Shaft-to-Shaft Applications

Sizes 7.0–12.4



Size	A	B	C	D	F	G	H	J	K	Wt. Lb. Less Oil	Max. Oz.
7.0	7.81	3.67	8.25	.56	1.000 .999	1.62	1.62	2.34	2.24	12.65	27.6
9.4	10.25	4.70	10.89	.77	1.250 1.249	2.06	2.12	3.10	3.09	27.70	65
12.4	13.50	5.98	13.67	.82	1.625 1.624	2.12	2.75	3.88	3.88	51.07	150

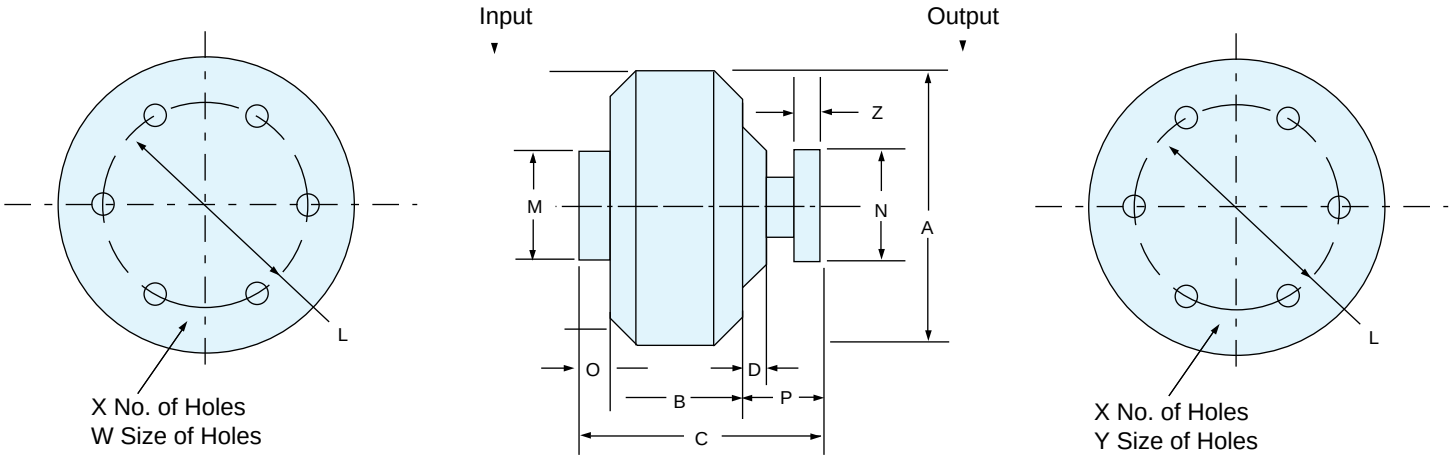
Single Flexing Coupling	
7.0	AJ15*
9.4	AJ30*
12.4	AJ30*

* Refers to TB Woods Form-Flex couplings

Model HCM

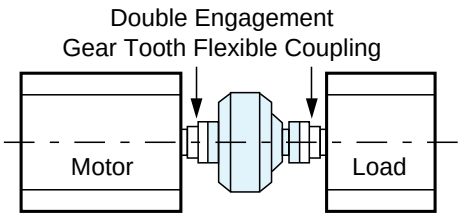
For Flexible Gear Couplings with Shrouded Bolts

Sizes 7.0–12.4



Size	A	B	C	D	L	M	N	O	P	W	X	Y	Z	Wt. Lb. Less Oil	Oil Max Oz.	WR² Lb. Ft.² Outer	WR² Lb. Ft.² Inner	Gear Coupling Size
7.0	7.81	3.67	5.98	.56	3.75	4.70	4.56	1.10	1.21	1/4-20 .56 Deep	6	.254 .256	3/16	16.10	27.6	.42	.10	1
9.4	10.25	4.70	7.49	.77	4.812	5.90	6.00	1.14	1.65	3/8-16 .65 Deep	8	.380 .382	1/4	32.25	65	1.27	.51	1-1/2
12.4	13.50	5.98	8.67	.82	4.812	6.85	6.00	1.14	1.55	3/8-16 .74 Deep	8	.380 .382	1/4	53.25	150	4.12	1.33	1-1/2

HCM



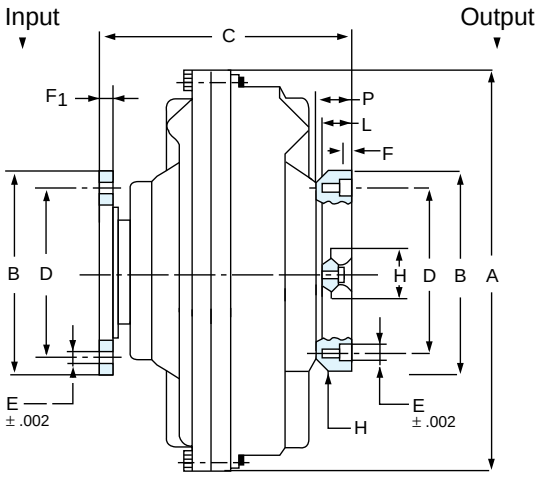
The Model HCM Fluid Coupling is a complete unit with both input and output flanges. It is intended for installation between two halves of a double engagement gear tooth flexible coupling which is customer supplied.

Size	Manufacturer	Model	Maximum Bore	Diameter of Shrouded Bolt Circle
7.0	Waldron Poole	1W MXB 1	1.63 1.63	3.750 3.750
9.4 and 12.4	Amerigear Waldron Poole	201.5 1.5 W MXB 1.5	2.38 2.19 2.19	4.812 4.812 4.812

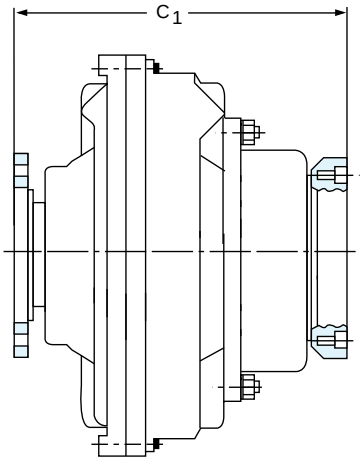
Note: Gear couplings must be with Shrouded Bolts!

For Flexible Gear Couplings with Shrouded Bolts

Sizes 15–34



Standard
HCM



Delayed
HCMD

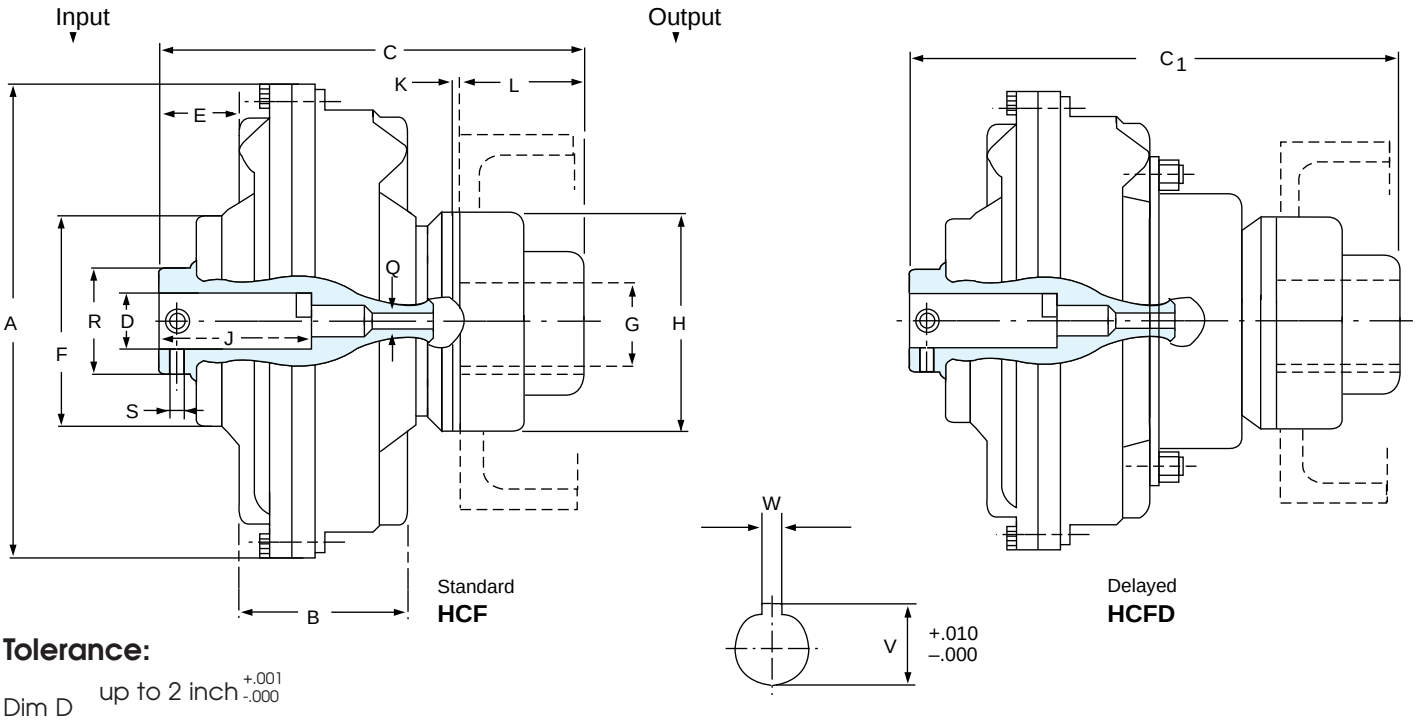
Size	A	B	D	E Nr.	E Dia.	F	F_1	H	L	C	C_1	Wt. Lb. Less Oil	Oil U.S. gal. Max	WR^2 lb.ft.^{2} Outer	WR^2 lb.ft.^{2} Inner	WR^2 lb.ft.^{2} Outer for HCMD	Gear Coupling Size
15	18.11	8.385	7.000	10	0.502	0.374	0.394	1/2-20	0.964	9.76	12.87	104 ▲ 112	2.02 ▲ 2.27	13.5	4.5	▲ 14.6	2-1/2
17	20.47	8.385	7.000	10	0.502	0.374	0.394	1/2-20	1.000	10.83	14.05	146 ▲ 158	3.09 ▲ 3.48	22.5	8.6	▲ 25.0	2-1/2
19	22.24	8.385	7.000	10	0.502	0.374	0.394	1/2-20	1.000	10.83	14.05	165 ▲ 178	3.75 ▲ 4.22	33	14.5	▲ 35.1	2 1/2
21	24.41	9.448	8.000	12	0.502	0.374	0.394	1/2-20	1.000	12.40	16.41	240 ▲ 262	5.02 ▲ 6.07	51	23	▲ 57.2	3
24	27.95	9.448	8.000	12	0.502	0.374	0.394	1/2-20	1.000	12.40	16.41	285 ▲ 307	7.50 ▲ 8.24	96	46	▲ 102.2	3
27	30.71	11.020	9.500	8	0.750	1.220	1.220	3/4-16	2.244	14.45	20.71	454 ▲ 505	11.09 ▲ 13.21	145	48	▲ 160.0	*3 1/2
29	33.86	11.020	9.500	8	0.750	1.220	1.220	3/4-16	2.244	15.59	21.85	562 ▲ 613	14.53 ▲ 16.64	220.5	66.4	▲ 235.4	*3 1/2
34	39.37	12.159	11.00	8	0.750	1.220	1.102	3/4-16	2.244	19.80	24.96	960 ▲ 978	21.80 ▲ 24.5	650	28.5	▲ 668.5	*4

▲ HCMD *Exposed Bolts

Model HCF

For Shaft-to-Shaft Applications

Sizes 15–34



Standard
HCF

Delayed
HCFD

Tolerance:

Dim D — up to 2 inch $^{+.001}_{-.000}$

from 2 to 4 inch $^{+.0015}_{-.000}$

Dim W — up to .500 inch $^{+.002}_{-.000}$

from .625 to 1 inch $^{+.003}_{-.000}$

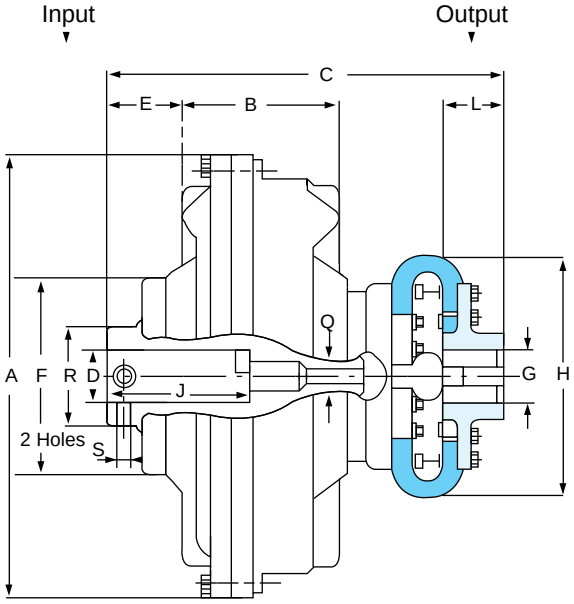
Size		D	J	W	V	A	B	C	C_1	E	F	G Max	H	K	L	Q	R	S	Wt. Lb. Less Oil	Oil U.S. Gal. Max.
15	●	2.875	7.000	.750	2.992	18.110	5.945	14.331	17.008	2.205	7.992	3.150	6.693	.118	4.331	7/8 9 UNC	3.976	5/8 11 UNC	110.7	2.020
	■	2.375	5.625	.625	2.651	18.110	5.945	14.331	17.008	2.205	7.992	3.150	6.693	.118	4.331		3.976		▲ 121.7	▲ 2.272
17	●	3.375	8.250	.875	3.635	20.472	6.693	15.236	18.386	2.441	8.858	3.543	9.843	.118	4.331	1-1/4 7 UNC	4.961	3/4 10 UNC	169.7	3.090
	■	2.875	7.000	.750	3.205	20.472	6.693	15.236	18.386	2.441	8.858	3.543	9.843	.118	4.331		4.961		▲ 185.2	▲ 3.487
19	● ■	3.375	8.250	.875	3.365	22.244	7.480	15.236	18.386	1.653	8.858	3.543	9.843	.118	4.331	1-1/4 7 UNC	4.961	3/4 10 UNC	185.0 ▲ 200.4	3.750 ▲ 4.227
21	●	3.875	8.500	1.000	4.106	24.409	8.071	18.071	22.008	2.795	9.842	4.331	11.417	.118	5.512	1-1/4 7 UNC	5.354	3/4 10 UNC	284.4	5.020
	■	3.375	8.250	.875	3.760	24.409	8.071	18.071	22.008	2.795	9.842	4.331	11.417	.118	5.512		5.354		▲ 308.7	▲ 6.076
24	● ■	3.875	8.500	1.000	4.106	27.953	9.015	18.071	22.008	1.850	9.842	4.331	11.417	.118	5.512	1-1/4 7 UNC	5.354	3/4 10 UNC	324.0 ▲ 348.0	7.500 ▲ 8.243
27	● ■	4.750	8.500	1.250	5.109	30.708	10.944	20.00	24.685	1.220	12.401	4.750	13.780	.157	5.905	1-3/4 5 UNC	7.283	7/8 9 UNC	509.2 ▲ 549.0	11.09 ▲ 13.21
29	● ■	5.250	9.500	1.250	5.617	33.858	12.007	21.102	25.748	1.220	13.780	4.750	13.780	.157	5.905	1-3/4 5 UNC	8.070	7/8 9 UNC	627.0 ▲ 666.7	14.531 ▲16.645
34	● ■	5.938	10.438	1.500	6.346	39.370	14.881	23.622	28.780	1.732	15.748	6.250	16.732	.197	5.905	1-3/4 5 UNC	7.874	1 8 UNC	1019 ▲ 1059	21.8 ▲ 24.5

▲ HCFD
● Max Bore
■ With Reduced Depth Keyway

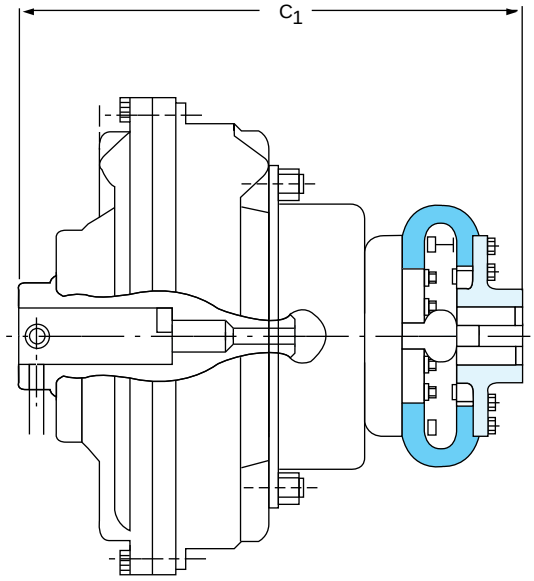
Model HCR

For Shaft-to-Shaft Applications

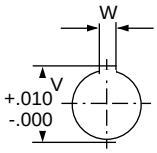
Sizes 15–34



Standard HCR



Delayed HCRD



Tolerance:

Dim D
- up to 2 inch $^{+.001}_{-.000}$
- from 2 to 4 inch $^{+.0015}_{-.000}$

Dim W
- up to .500 inch $^{+.002}_{-.000}$
- from .625 to 1 inch $^{+.003}_{-.000}$

When ordering units please specify
Dim.-D Diameter (G upon request)

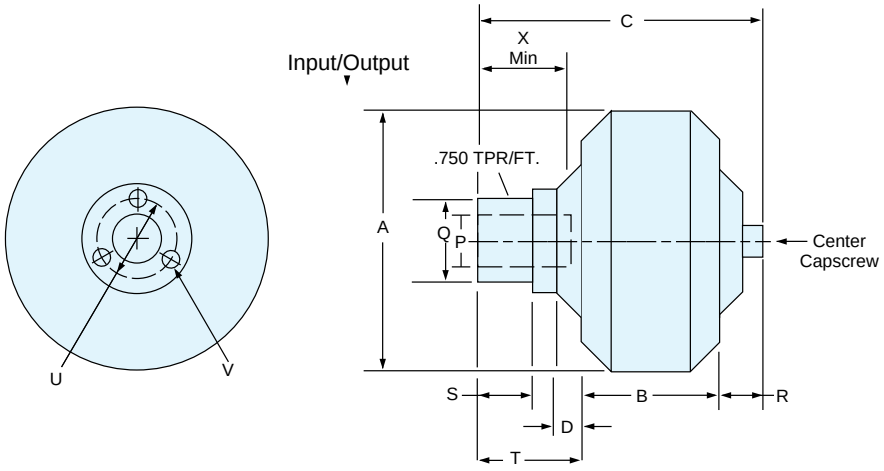
Size		D	J	W	V	A	B	C	C_1	E	F	G Max.	H	L	Q	R	S
15	●■	2.875	7.000	.750	2.992	18.110	5.945	15.275	17.952	2.205	7.992	2.756	9.252	3.149	7/8 9 UNC	3.976	5/8 11 UNC
15		2.375	5.625	.625	2.651	18.110	5.945	15.275	17.952	2.205	7.992	2.756	9.252	3.149		3.976	
15		2.125	5.000	.500	2.350	18.110	5.945	15.275	17.952	2.205	7.992	2.756	9.252	3.149		3.976	
17	●■	3.375	8.250	.875	3.635	20.472	6.693	15.945	19.094	2.441	8.858	2.952	11.338	3.543	1-1/4 7 UNC	4.961	3/4 10 UNC
17		2.875	7.000	.750	3.205	20.472	6.693	15.945	19.094	2.441	8.858	2.952	11.338	3.543		4.961	
19	●■	3.375	8.250	.875	3.635	22.244	7.480	15.945	19.094	1.653	8.858	2.952	11.338	3.543		4.961	
19		2.875	7.000	.750	3.205	22.244	7.480	15.945	19.094	1.653	8.858	2.952	11.338	3.543		4.961	
21	●■	3.875	8.500	1.000	4.106	24.409	8.071	20.551	24.488	2.795	9.842	3.543	14.882	4.331		5.354	
21		3.375	8.250	.875	3.760	24.409	8.071	20.551	24.488	2.795	9.842	3.543	14.882	4.331		5.354	
24	●■	3.875	8.500	1.000	4.106	27.953	9.015	20.551	24.488	1.850	9.842	3.543	14.882	4.331		5.354	
27	●■	4.750	8.500	1.250	5.109	30.708	10.944	21.653	26.299	1.220	12.401	3.937	18.189	4.803	1-3/4 5 UNC	7.283	7/8 9 UNC
29	●■	5.250	9.500	1.250	5.617	33.858	12.007	23.622	28.267	1.220	13.780	4.724	20.866	5.708		8.070	
34	●■	5.938	10.438	1.500	6.346	39.370	14.881	26.889	32.046	1.732	12.13	5.500	24.803	6.496		9.84	1 8 UNC

● Max Bore
■ With Reduced Depth Keyway

Model HSD

For Parallel Shaft Applications

Sizes 7.0–12.4



P = Standard Input Sizes

Size	Bore	Key
7.0	7/8	3/16
	1	1/4
	1 1/8	1/4
	1 3/8	5/16
Size	**Bore**	**Key**
9.4	1 1/8	1/4
	1 3/8	5/16
	1 5/8	3/8
Size	**Bore**	**Key**
12.4	1 5/8	3/8
	1 7/8	1/2
	2 1/8	1/2
	2 3/8	5/8

Size	A	B	C	D	Q	R	S	T	U	V	X	Q.D. Hub Size	Dry Wt.
7	7.81	3.67	7.05	.56	2.149	.84	1.15	2.54	2.687	1/2-20	2.00	SD	12.75
9.4	10.25	4.70	9.35	.77	2.736	1.12	1.45	3.53	3.313	5/16-18	2.50	SK	37.75
12.4	13.50	5.98	12.12	.82	3.736	1.24	1.87	4.90	5.000	1/2-13	3.00	E	68.00

Do not use Eaton QD sheaves.
Bolt pattern is not the same.

Vertical Mounting For HSD

When mounting the 7.0, 9.4 or 12.4 HSD on a vertical shaft, the motor and collet should be mounted above the sheave and fluid coupling. This position insures even the smallest oil fill will react with the motor.

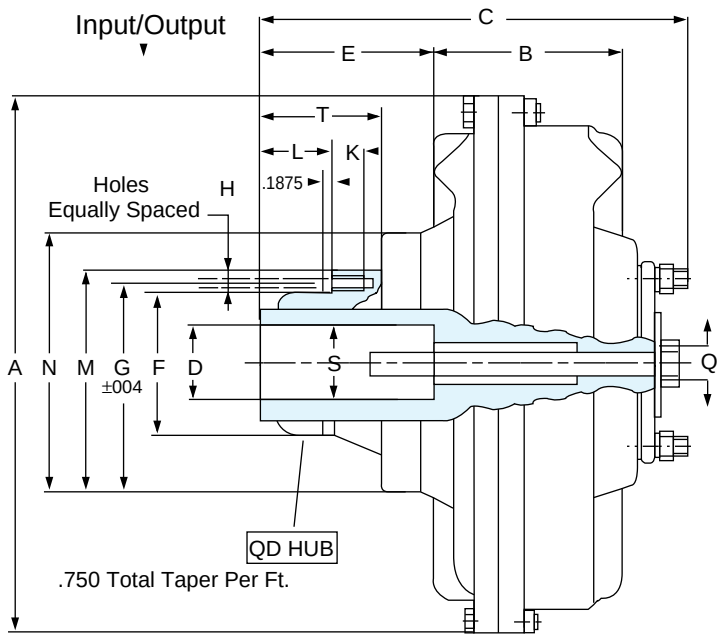
Furthermore, order the unit with the standard and optional fill plugs on both sides of the unit. This allows for the addition and maintenance of the oil level within the fluid coupling.

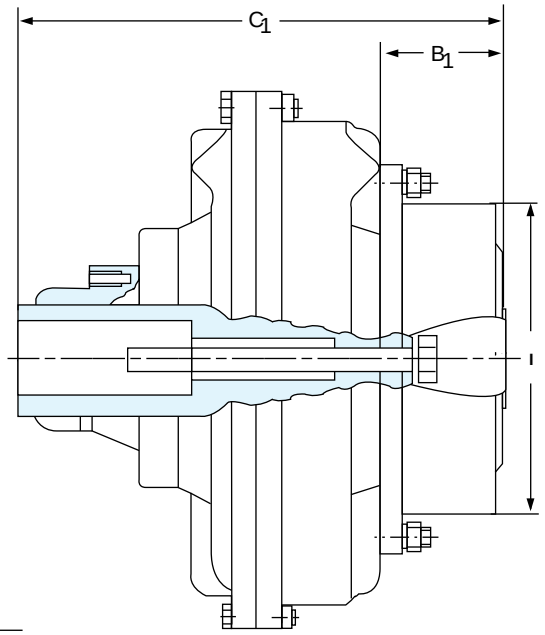
HSD	Maximum Speed
7.0	3600 RPM
9.4	2600 RPM
12.4	1800 RPM

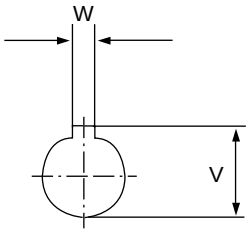
Important note:

Size	Center Capscrew Torque
7.0	38-42 ft-lbs
9.4 and 12.4	177- 195 ft-lbs

Sizes 15-24







Standard
HSD

Delayed
HSDD

Tolerance:

Dim D
up to 2 inch $^{+.001}_{-.000}$
from 2 to 4 inch $^{+.0015}_{-.000}$

Dim W
up to .500 inch $^{+.002}_{-.000}$
from .625 to 1 inch $^{+.003}_{-.000}$

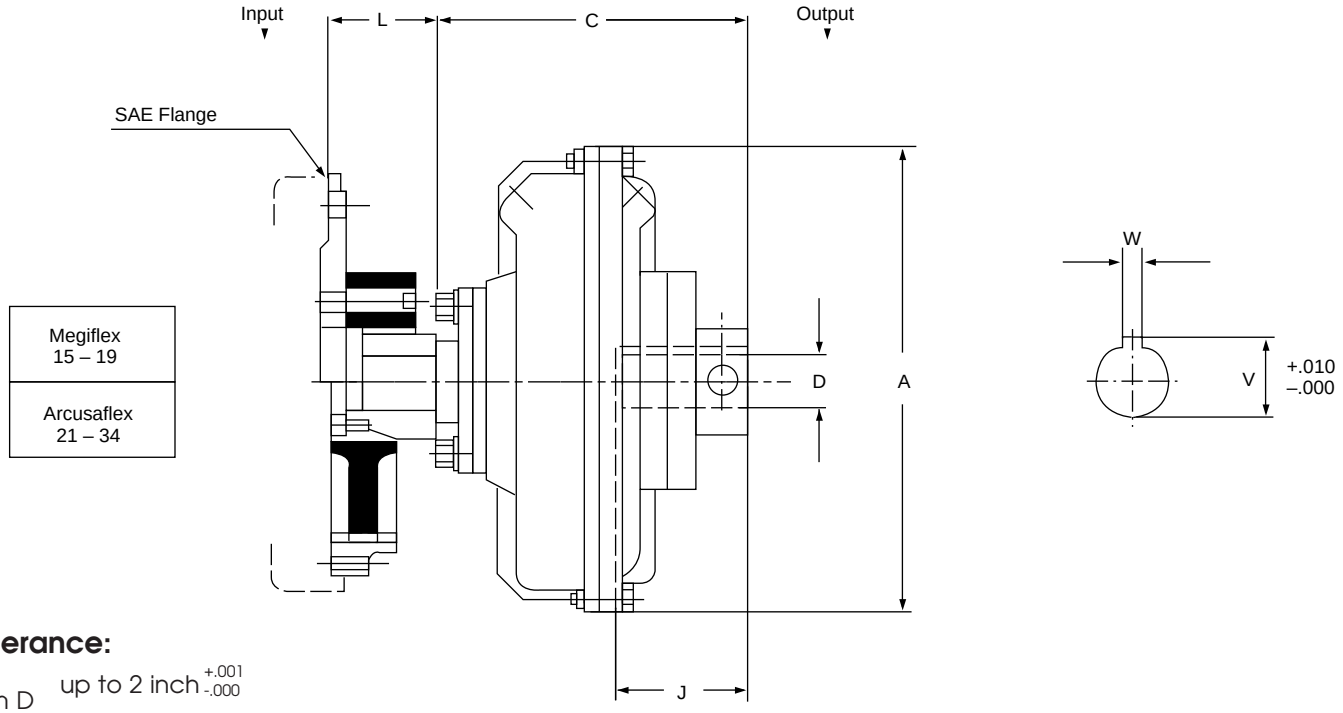
Size	D	J	W	V	A	B	B_1	C Max	C_1	E	F	G	H Nr.	H Dia.	I	K	L	M	N	Q	T	S	QD Hub Size	Wt. Less Oil	Oil US Gal Max
15 ●■	2.875	7.000	.750	2.992	18.110	5.945	3.425	15.118	17.244	7.677	4.4375	5.625	3	9/16 12 UNC	10.039	1.181	3.397	6.663	8.032	7/8 9 UNC	6.362	3/4 10 UNC	F	107	2.02
15	2.375	5.625	.625	2.651	18.110	5.945	3.425	15.118	17.244	7.677	4.4375	5.625	3		10.039	1.181	3.397	6.663	8.032		6.362			▲115.8	▲2.27
17 ●■	3.375	8.250	.875	3.635	20.472	6.693	3.779	17.913	20.315	9.654	5.1484	6.250	3		12.992	1.378	4.331	7.25	8.976		8.449		J	156	3.09
17	2.875	7.000	.750	3.205	20.472	6.693	3.779	17.913	20.315	9.654	5.1484	6.250	3	5/8 11 UNC	12.992	1.378	4.331	7.25	8.976		8.449			▲169.2	▲3.48
19 ●■	3.375	8.250	.875	3.635	22.244	7.480	3.779	17.913	20.315	8.858	5.1484	6.250	3		12.992	1.378	4.331	7.25	8.976	1-1/4 7 UNC	8.449	7/8 9 UNC	J	174	3.75
19	2.875	7.000	.750	3.205	22.244	7.480	3.779	17.913	20.315	8.858	5.1484	6.250	3		12.992	1.378	4.331	7.25	8.976		8.449			▲187.2	▲4.22
21 ●	3.875	8.500	1.000	4.314	24.409	8.071	4.330	21.456	24.408	11.811	6.500	7.875	4		15.748	1.575	7.085	9.00	9.842		10.236		M	270	5.02
21	3.375	8.250	.875	3.760	24.409	8.071	4.330	19.882	22.833	10.236	6.500	7.875	4	3/4 10 UNC	15.748	1.575	5.511	9.00	9.842		8.661			▲292	▲6.08
24 ●	3.875	8.500	1.000	4.314	27.953	9.015	4.330	21.456	24.408	10.866	6.500	7.875	4		15.748	1.575	7.085	9.00	9.842		10.236		M	307	7.50
																								▲329	▲8.24

▲ HSDD
● Max Bore
■ With Reduced Depth Keyway

Model KRDA

For Diesel and Gas Engine Flywheel Application

Sizes 15–34



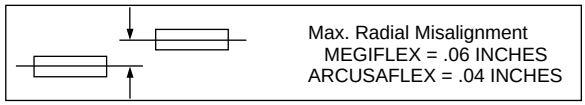
Tolerance:

Dim D up to 2 inch $^{+.001}_{-.000}$

from 2 to 4 inch $^{+.0015}_{-.000}$

Dim W up to .500 inch $^{+.002}_{-.000}$

from .625 to 1 inch $^{+.003}_{-.000}$



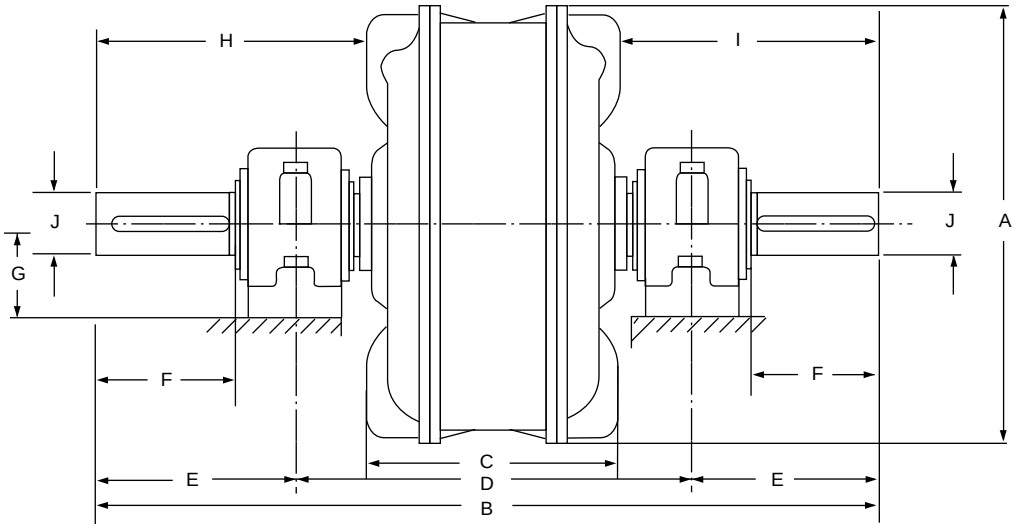
Size	Flywheel	Flexible Element	RPM	D	J	W	V	A	C	L
15	● 11" 1/2	2132	2500	■ 2.875	7.000	.750	2.992	18.110	9.882	3.858
15	14"	2132	2500	■ 2.875	7.000	.750	2.992	18.110	9.882	3.858
17	11" 1/2	2142	2500	■ 3.375	8.250	.875	3.635	20.472	11.338	3.858
17	● 14"	2142	2500	■ 3.375	8.250	.875	3.635	20.472	11.338	3.858
19	11" 1/2	2142	2200	■ 3.375	8.250	.875	3.635	22.244	11.338	3.858
19	● 14"	2142	2200	■ 3.375	8.250	.875	3.635	22.244	11.338	3.858
21	● 14"	AC-5	2000	■ 3.875	8.500	1.000	4.106	24.409	11.260	4.291 ±. 20
21	16"	AC-5	2000	■ 3.875	8.500	1.000	4.106	24.409	11.260	4.291 ± .20
24	● 14"	AC-6	1800	■ 3.875	8.500	1.000	4.106	27.953	11.260	4.921 ± .24
24	16"	AC-6	1800	■ 3.875	8.500	1.000	4.106	27.953	11.260	4.921 ± .24
27	14"	AC-7	1800	■ 4.750	8.500	1.250	5.109	30.708	12.677	5.039 ± .24
27	● 16"	AC-7	1800	■ 4.750	8.500	1.250	5.109	30.708	12.677	5.039 ± .24
27	18"	AC-7	1800	■ 4.750	8.500	1.250	5.109	30.708	12.677	5.039 ± .24
29	14"	AC-7	1500	■ 5.250	9.500	1.250	5.617	33.858	13.740	5.039 ± .24
29	● 16"	AC-7	1500	■ 5.250	9.500	1.250	5.617	33.858	13.740	5.039 ± .24
29	● 18"	AC-7	1500	■ 5.250	9.500	1.250	5.617	33.858	13.740	5.039 ± .24
34	● 21"	AC-9	1500	■ 5.938	10.438	1.500	6.346	39.370	17.598	4.055 ± .24

● Standard Flywheel
■ With Reduced Depth (Rectangular) Keyway

Model KBM

For Shaft-to-Shaft Applications

Size D34

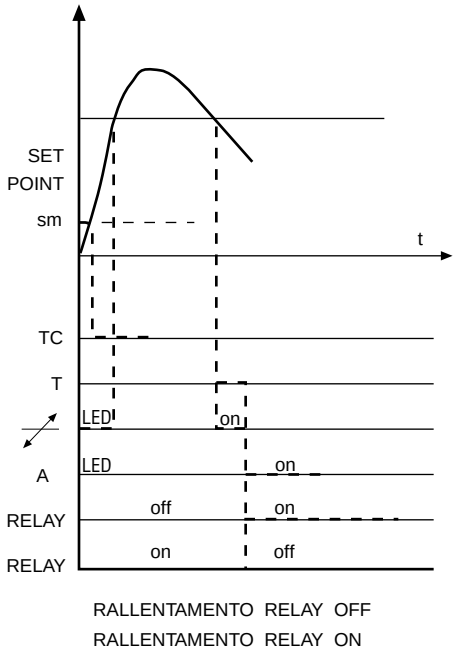


Double chamber size 34

Size	A	B	C	D	E	F	G	H	I	J	Wt. Lb. Less Oil	Oil U.S. Gal Oil
D 34	39.37	55.118	25.197	34.842	10.138	5.512	6.693	15.079	14.842	5.51	1785	42.8

Electronic Overload Controller

Operation



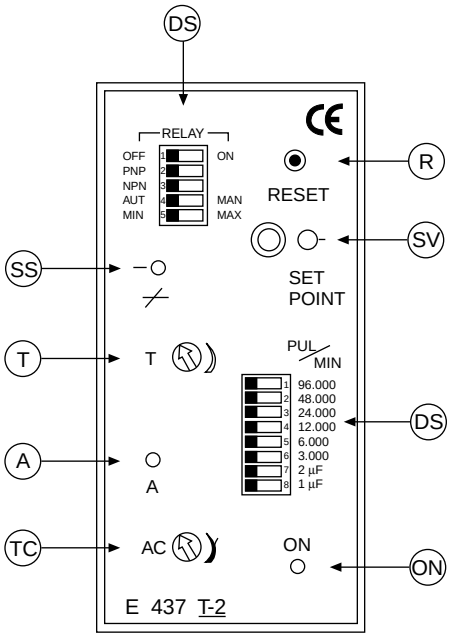
As the load torque increases, the fluid coupling slip increases, therefore an output speed decrease will occur. This can be detected by a speed sensor (PROXIMITY) that sends an impulse train to speed controller.

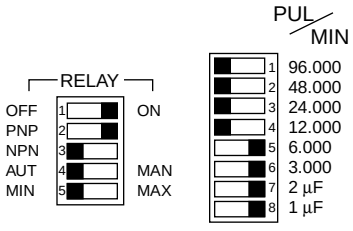
If speed reduces down to the set threshold, this is signaled by the intervention of internal relay.

Device has a blind time "TC" (1 to 120 sec.) that avoids alarm intervention during start up and a delay time (1 to 30 sec.) that prevents from undesired relay intervention during sudden changes of torque.

Device also provides a speed proportional voltage output signal (0-10 Volt) to be forwarded to display or to signal transducer (4-20 mA).

Control Panel





TC BLIND TIME FOR STARTING
Set screw regulation up to 120 sec.

DS DIP-SWITCH (5 positions)
Relay condition, proximity type, reset system, acceleration or deceleration.

Programming speed DIP-SWITCH (PUL/MIN), 8 positions permit to choose the requested range.

SV SPEED LEVEL (set point)
Set screw regulation with numbers from 1 to 10. Value of 10 corresponds to full range set with dip-switch.

R RESET
Local manual reset is possible through button R or remote reset connecting contact N.O. at pins 2-10.

SS SPEED LEVEL OVERTAKEN
It lights whenever level speed is overtaken.

A ALARM LED
It lights when internal relay is closed.

T DELAY TIME
Set screw regulation up to 30 sec.

ON GREEN LED
It means that device is electrically supplied.

As the load torque increases, the fluid coupling slip increases , therefore an output speed decrease will occur. This can be detected by a speed sensor (PROXIMITY) that sends an impulse train to speed controller.

If speed reduces down to the set threshold, this is signaled by the intervention of internal relay.

Device has a blind time "TC" (1 to 120 sec.) that avoids alarm intervention during start up and a delay time (1 to 30 sec.) that prevents from undesired relay intervention during sudden changes of torque. Device also provides a speed proportional voltage output signal (0-10 Volt) to be forwarded to display or to signal transducer (4-20 mA).

Control Panel

TC BLIND TIME FOR STARTING
Set screw regulation up to 120 sec.

DS DIP-SWITCH (5 positions)
Relay condition, proximity type, reset system, acceleration or deceleration.

Programming speed DIP-SWITCH (PUL/MIN), 8 positions permit to choose the requested range.

SV SPEED LEVEL (set point)
Set screw regulation with numbers from 1 to 10. Value of 10 corresponds to full range set with dip-switch.

R RESET
Local manual reset is possible through button R or remote reset connecting contact N.O. at pins 2-10.

SS SPEED LEVEL OVERTAKEN
It lights whenever level speed is overtaken.

A ALARM LED
It lights when internal relay is closed.

T DELAY TIME
Set screw regulation up to 30 sec.

ON GREEN LED
It means that device is electrically supplied.

Display

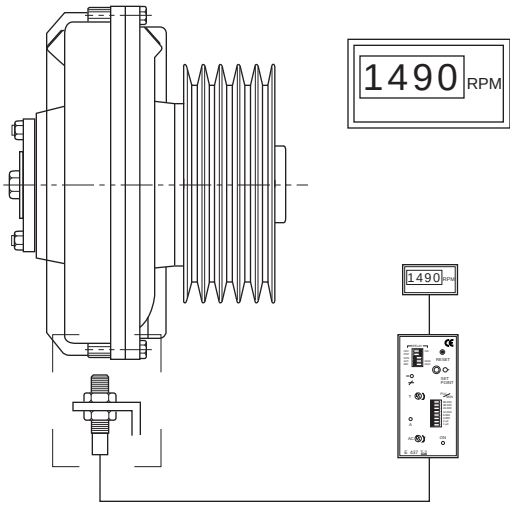


Fig. 1

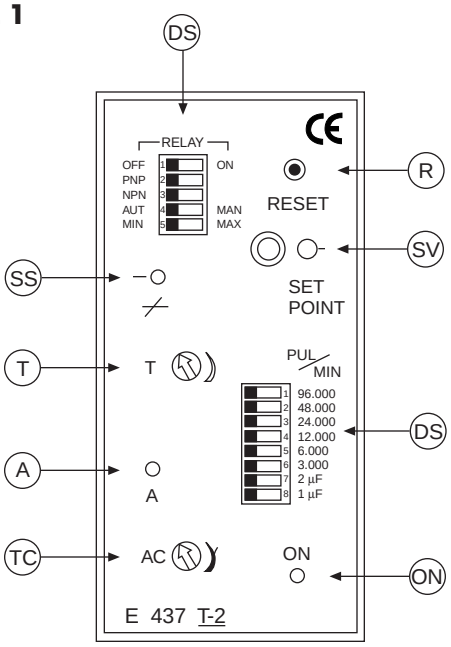


Fig. 2