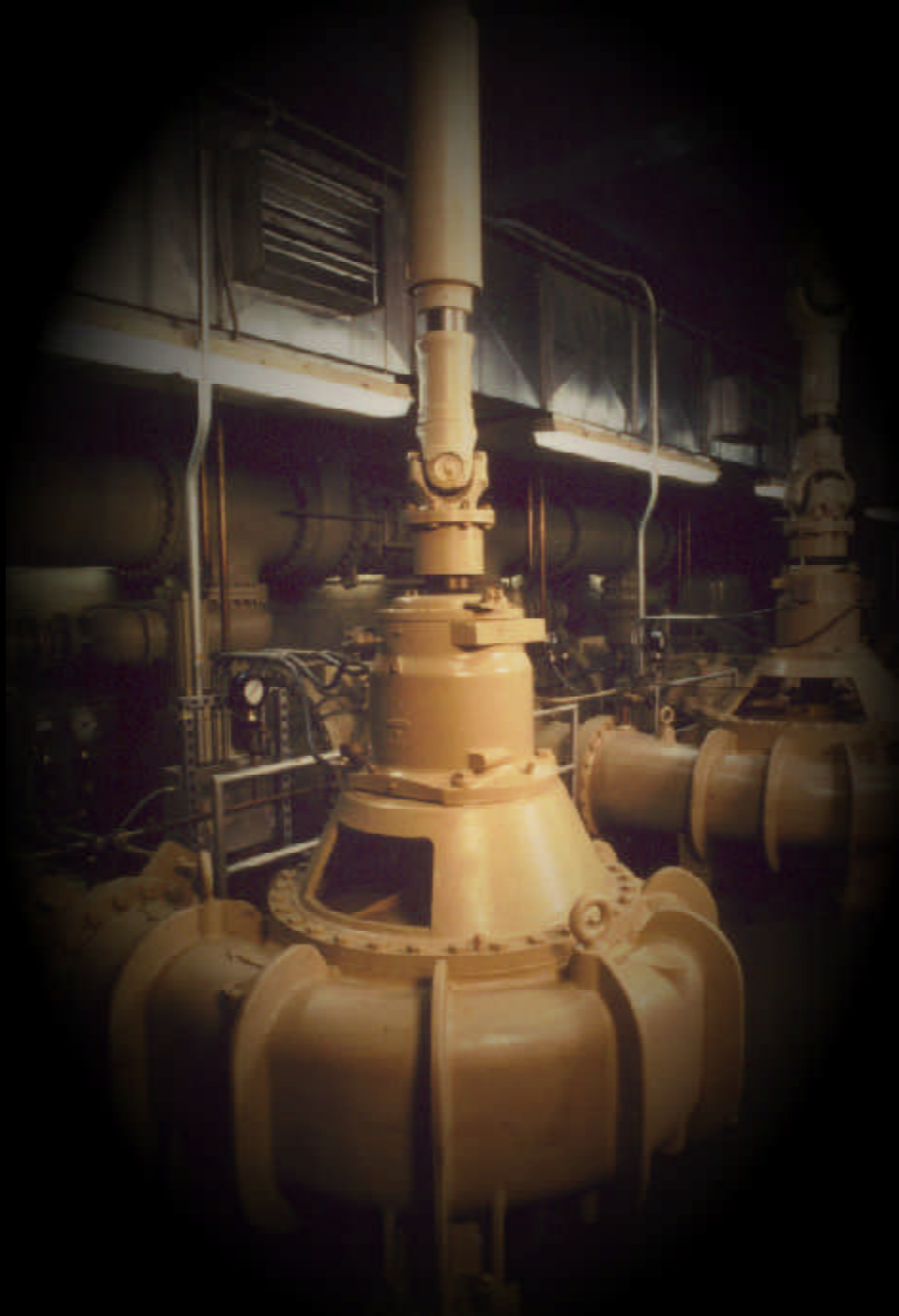




JOHNSON POWER LTD.

POWER THROUGH PERFORMANCE



**HIGH PERFORMANCE
INDUSTRIAL UNIVERSAL JOINTS
FOR PUMPING APPLICATIONS**



INTRODUCING JOHNSON POWER....

...The world's leading manufacturer of intermediate shafting systems for pumping!

UNIVERSAL JOINT SHAFTING

Universal Joint style shafts represent the primary coupling of choice in a variety of pumping systems including....

- .. **Vertical dry pit pumps for both water & wastewater**
- .. **Slurry Pumps**
- .. **Fire Pumps**
- .. **Polymer Pumps**
- .. **Irrigation Pumps**
- .. **Concrete Pumps**
- .. **Oil-field fracture Pumps**
- .. **Stand-by mobile systems**
- .. **De-watering Pumps**

Universal joints are chosen for these applications because they provide...

- .. **Ease of Installation**
- .. **Durability**
- .. **High efficiency with predictable life**
- .. **Ease of Repair/Maintenance**
- .. **Maximum Design Freedom**

Johnson Power also offers...

ENGINEERING EXPERTISE

- ◆ Torsional & lateral systems modeling
- ◆ Hands on/In-field experience measuring product response with an extensive background in vibration analysis & trouble shooting
- ◆ Innovative new materials & designs including composites & rubber element torsional dampeners

And we also have...

- ◆ Other coupling styles including gear & disc pack elements & rigid couplings for that unique project.

So, whether you're involved in the design of a new system or require assistance in upgrading an existing station, please give us the opportunity to be of service. We thank our growing list of friends in the pumping industry for your business and confidence. At Johnson Power, we will continue to strive to meet your highest expectations.

Wayne Johnson, President



DRIVE SHAFT SELECTION

Series selection for vertical wastewater applications depends primarily on the following operating parameters.

1. Power Source Type
2. Continuous Operating Torque
3. Bearing Life Required
4. Maximum RPM
5. Angular Offset
6. Distance to be spanned

Initial selection can be made by using the HP/RPM graph on the following pages.

This graph is based upon 8000 hrs. B-10 life at a maximum 3 degree angle with an electric motor power source.

If these parameters are appropriate, simply intersect HP with RPM and use the series indicated.

If you require more bearing life, higher angular offset (not recommended) or have a diesel or gas engine power source, first multiply the HP by the applicable correction factors and then make your selection.

Prime Mover Factor F1

Electric Motor	1.00
Gasoline Engine	1.25
Diesel Engine	1.50

Note: If torsional elastic member (clutch etc.) is NOT used, increase values by .50 respectively.

Gasoline Engine	1.75
Diesel Engine	2.00

Bearing Life Factor F2

8,000 hrs	1.00
10,000 hrs	1.07
20,000 hrs	1.32
50,000 hrs	1.73
100,000 hrs	2.13

Operating Angle Factor F3

3 degrees	1.00
4 degrees	1.09
5 degrees	1.17
6 degrees	1.23
7 degrees	1.29
8 degrees	1.34

Recommended angular offset for vertical pumping applications is 1/2 to 1 degree.

Increase in angularity will increase the forcing frequency of the potential 2X universal joint excitation and is therefore not recommended. Where increased angularity is necessary it must never exceed the speed to angle factor (SAF).

$$SAF = RPM \times \text{Angle (degrees)}$$

Maximum SAF for all series is 12,000.

Consult Johnson Power for any angular offset over 3 degree for final recommendation.

Critical Speed Calculation

Universal Joint Drive Shafts are considered flexible elastic masses that have a critical speed (lateral natural frequency) that is a function of Length, RPM, Tube Diameter and Wall thickness.

Precaution must be taken to insure that the operating speed of the drive shaft avoids the full and half critical excitation range, as well as blade pass excitation.

The following formula is used to calculate the critical speed.

- CS = Critical Speed
- D = Outside Tube Diameter (in.)
- d = Inside Tube Diameter (in.)
- EL = Effective Length

$$CS = \frac{4.8 \times 10^6 \sqrt{D^2 + d^2}}{EL^2}$$

Note: To determine effective length of universal joint drive shaft see page 22.

The critical speed can be affected by many variables, thus the maximum operating speed in a constant speed system must operate at a safety margin at least 25% less than calculated critical speed

$$\text{Maximum Safe Operating Speed} = CS \times .75$$

Half Critical Speed

Universal joints may also be excited at their half critical speed. Thus, in constant speed applications, universal joint shafts should be sized to operate above or below calculated half critical speed and below safe operating speed by the appropriate safety margins.

$$\frac{1}{2}CS = \frac{\text{Constant Speed}(CS)}{2}$$

Note: In variable speed applications, universal joint shafts should be sized to operate below calculated half critical speed or blade pass exciting frequencies with appropriate safety margins.

In general, it is best to avoid long shaft lengths at high speeds. In addition, bearing support structures must be substantial and rigid or they will lower critical speed of universal joint shafts.

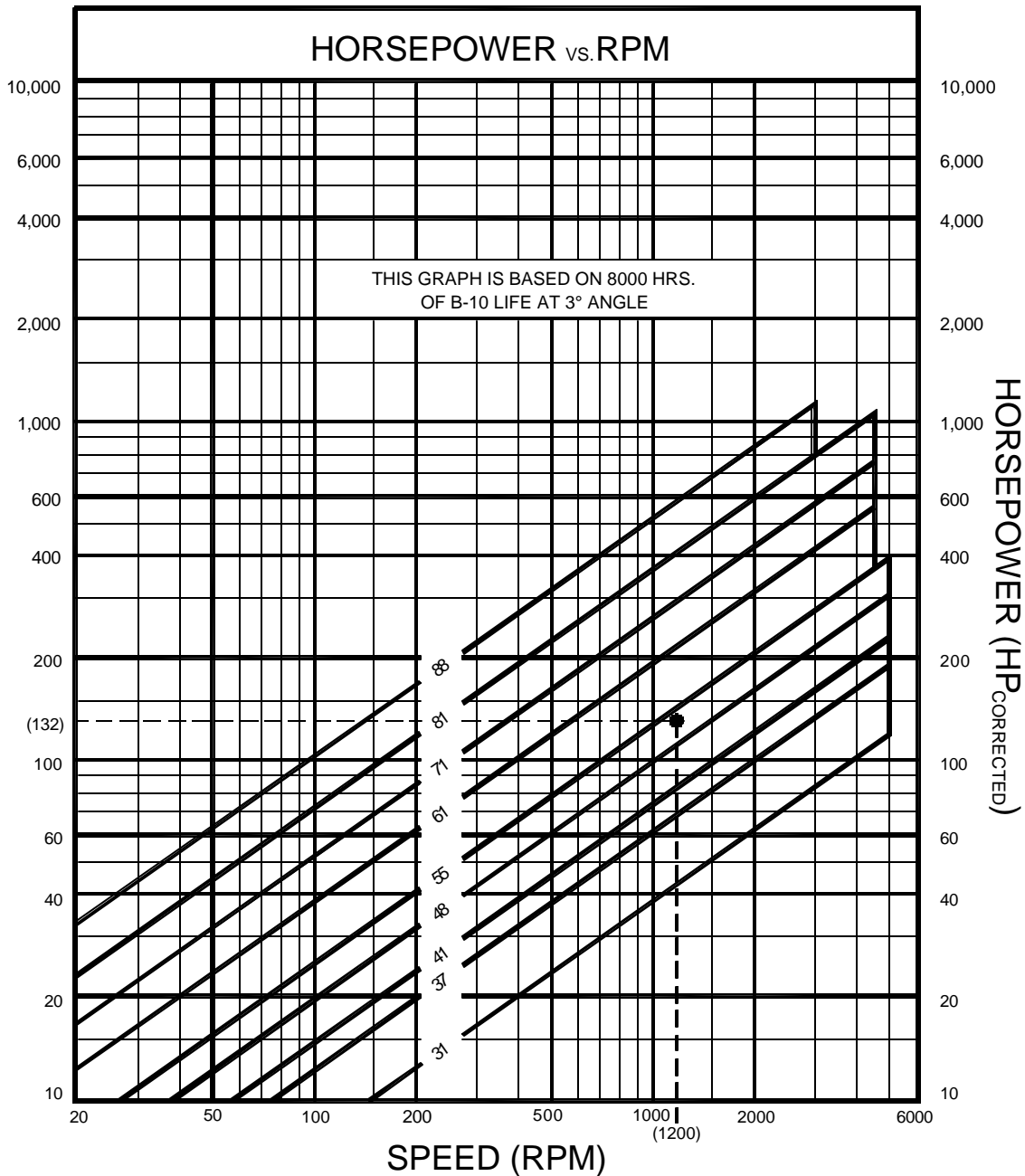
Johnson Power's staff is readily available to provide this calculation service.

Shafting should also avoid any other potential exciters such as vane passing. Simply compare the running RPM x the number of impeller vanes with the calculated critical speed and verify that the appropriate safety margins are satisfied.

Torsional Natural Frequency

In addition, it is also necessary to calculate the torsional natural frequency of the system. Please provide Mass Moment of Inertia (WR²) and torsional windup (spring rate - Kt) for the motor and pump and Johnson Power will provide this more complex calculation.

It is necessary to size the system both torsionally and laterally. So please consult Johnson Power with the application information for the proper shafting selection.



Selection

**The graph is for preliminary selection only.
Contact Johnson Power for final selection.**

Note: Dynamic balance recommended above 300 RPM.

Free Selection Assistance is available from Johnson Power at (708) 345-4300. For a preliminary selection multiply driver service factor, life service factor, and angle service factor times motor HP to get corrected HP and then intersect maximum corrected HP with required RPM.

FACTORS

F1= 1 (AC Motor)

F2= 1.32 .. (20,000 HRS.)

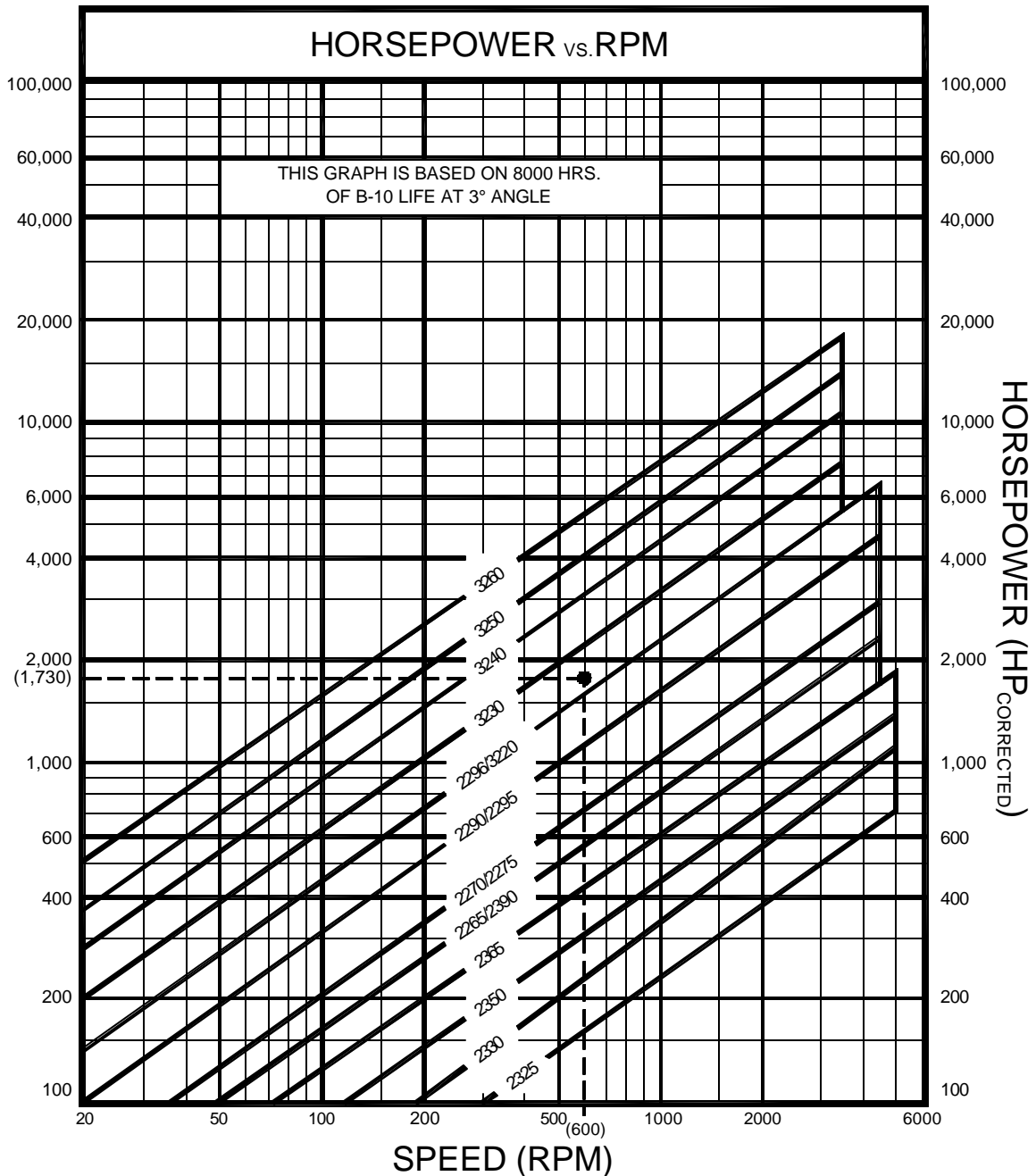
F3= 1 (3°Degree or less Angle)

Example: 100 HP at 1200 RPM, Electric Motor and joint angle 3° or less. Requiring 20,000 or less hours.

$$HP \times F1 \times F2 \times F3 = HP_{Corrected}$$

$$100 \times 1.32 = 132 HP_{Corrected}$$

Answer: 55 series can be used.



The graph is for preliminary selection only.
Contact Johnson Power for final selection.

Note: Dynamic balance recommended above 300 RPM.

Free Selection Assistance is available from Johnson Power at (708) 345-4300. For a preliminary selection multiply driver service factor, life service factor, and angle service factor times motor HP to get corrected HP and then intersect maximum corrected HP with required RPM.

FACTORS

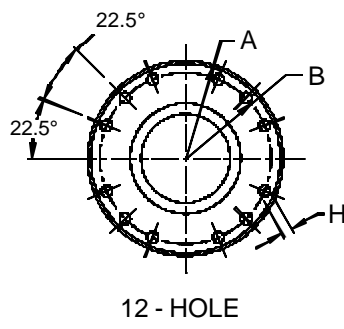
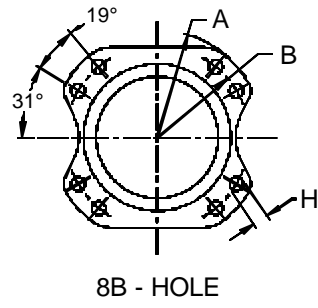
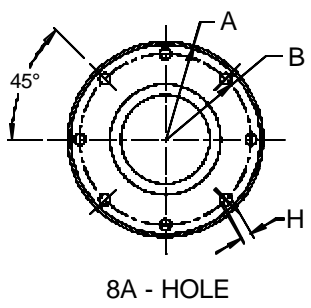
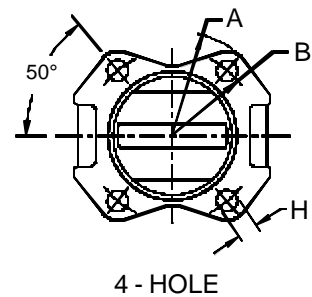
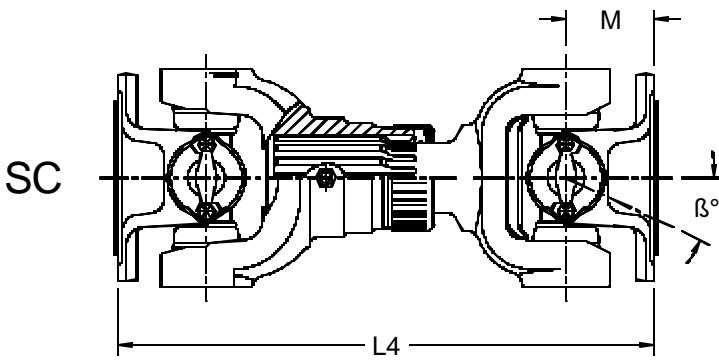
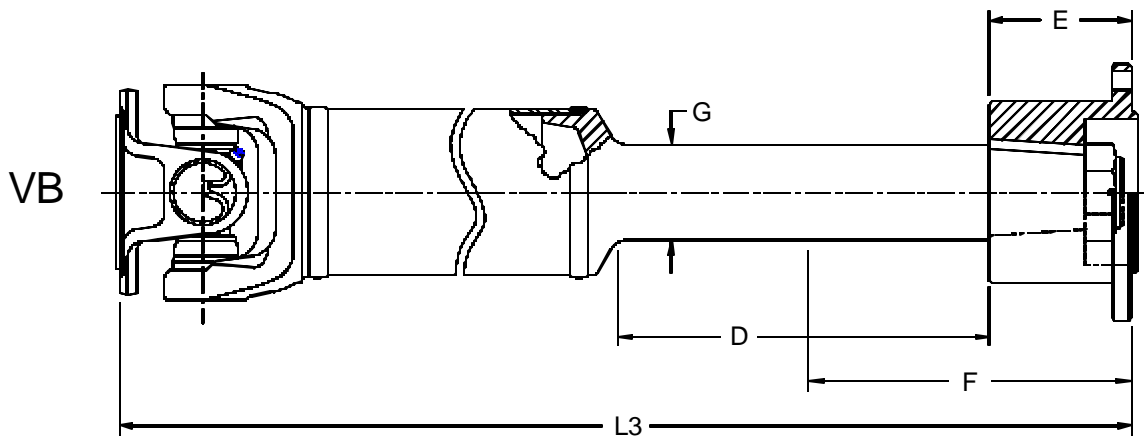
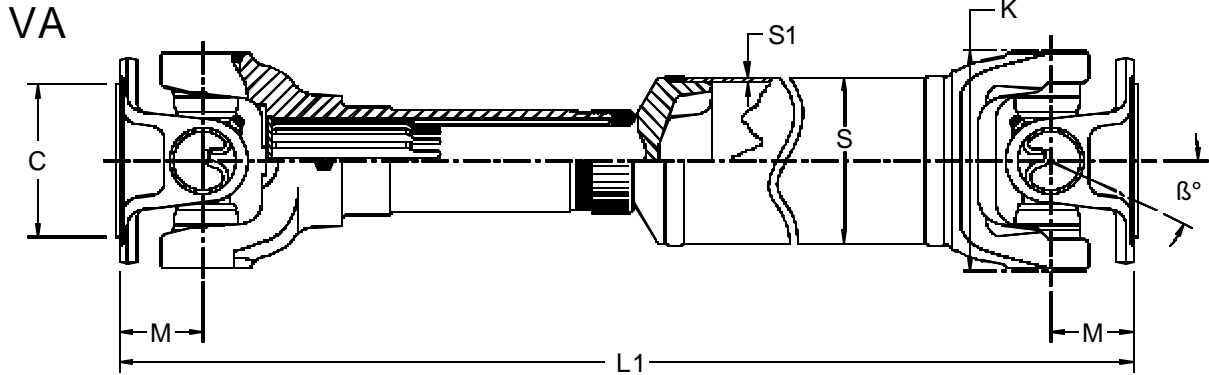
- F1= 1 (AC Motor)
- F2= 1.73 .. (50,000 HRS.)
- F3= 1 (3°Degree or less Angle)

Example: 1000 HP at 600 RPM, Electric Motor and joint angle 3° or less. Requiring 50,000 or less hours.

$$HP \times F1 \times F2 \times F3 = HP_{Corrected}$$

$$1,000 \times 1.73 = 1,730 HP_{Corrected}$$

Answer: 3230 series can be used.





Series	31	37	41	48	55	61	71	81	88
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TORQUE RATINGS / ALL TORQUE IN FT-LBS

TS	800	1240	1500	2000	2400	3650	4800	6500	8900
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DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES

A	3.88	4.56	4.56	5.88	5.88	6.88	8.00	8.00	9.63
Angle β°	20	20	22	22	22	22	22	20	20
B	3.125	3.750	3.750	4.750	4.750	6.125	7.250	7.250	8.250
C	2.375	2.750	2.750	3.750	3.750	6.625	7.750	7.750	7.000
H	.375	.438	.438	.500	.500	.375	.375	.438	.625
I (# Bolt Holes)	4	4	4	4	4	8A	8A	12	8B
K	3.88	4.62	4.69	4.81	5.63	7.00	7.75	9.13	9.75
M	1.38	1.56	1.69	2.00	2.00	2.75	3.00	3.38	3.50
S (Std)	2.50	3.00	3.50	3.50	3.50	3.50	4.00	4.50	4.50
S1 (Std)	.083	.083	.083	.083	.095	.134	.134	.134	.259
WT/IN (Std Tube)	.178	.215	.252	.252	.288	.401	.461	.520	.977

MODEL VA - SHAFT WITH STANDARD LENGTH COMPENSATION

L1 (Midslip)	15.22	16.77	17.55	16.75	17.00	25.38	24.25	26.44	27.44
L2 (±)	1.56	1.81	1.74	1.25	1.25	2.44	1.94	1.69	1.75
COMP WT (Lbs.)	13.5	25.0	25.0	27.0	37.0	45.0	68.0	99.0	152.0

MODEL VB - STUB SHAFT WITH NO LENGTH COMPENSATION

D	6.00	6.00	6.00	8.00	8.00	8.00	8.00	8.00	8.00
E	2.06	2.06	2.56	2.12	2.94	2.94	3.69	3.69	4.62
F	5.06	5.06	5.56	6.12	6.94	6.94	7.69	7.69	8.62
G	1.187	1.187	1.437	1.687	1.937	1.937	2.187	2.437	2.937
L3	13.00	13.00	14.00	16.00	17.00	18.00	19.00	20.00	22.00
COMP WT (Lbs.)	11.5	20.0	20.0	21.6	34.0	36.0	55.4	83.3	122.0

MODEL SC - SHORT SHAFT WITH LENGTH COMPENSATION

M	1.38	1.56	1.69	1.50	2.00	1.88	2.00	2.59	2.50
Angle (Deg) β	15	8	8	8	8	8	8	12	8
L4	9.44	9.87	9.87	9.00	10.25	9.49	10.99	13.96	14.12
L2 (±)	.56	.37	.37	.50	.50	.37	.37	.56	.50
WEIGHT (Lbs.)	7.0	11.0	13.5	19.5	29.5	44.0	47.0	78.0	142.0

L1 = MINIMUM MIDSLIP LENGTH (TUBULAR DESIGN, LONGER LENGTHS AVAILABLE)

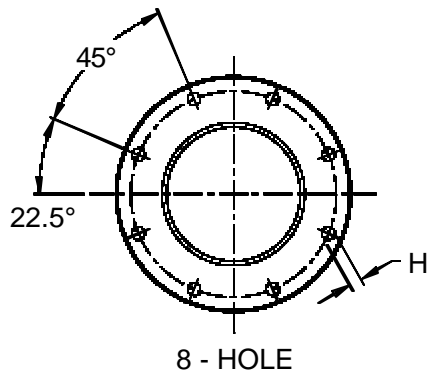
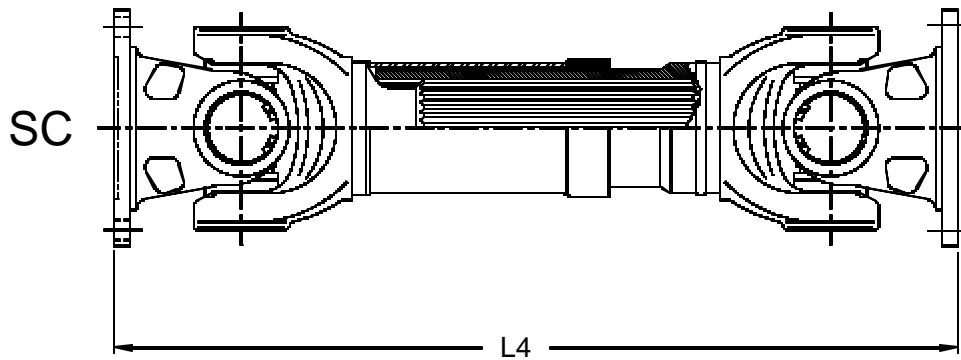
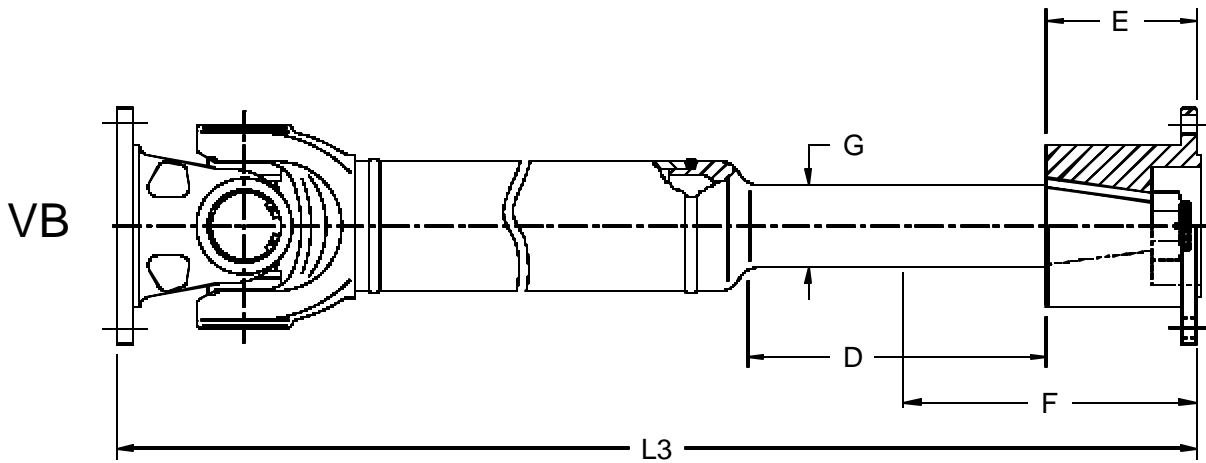
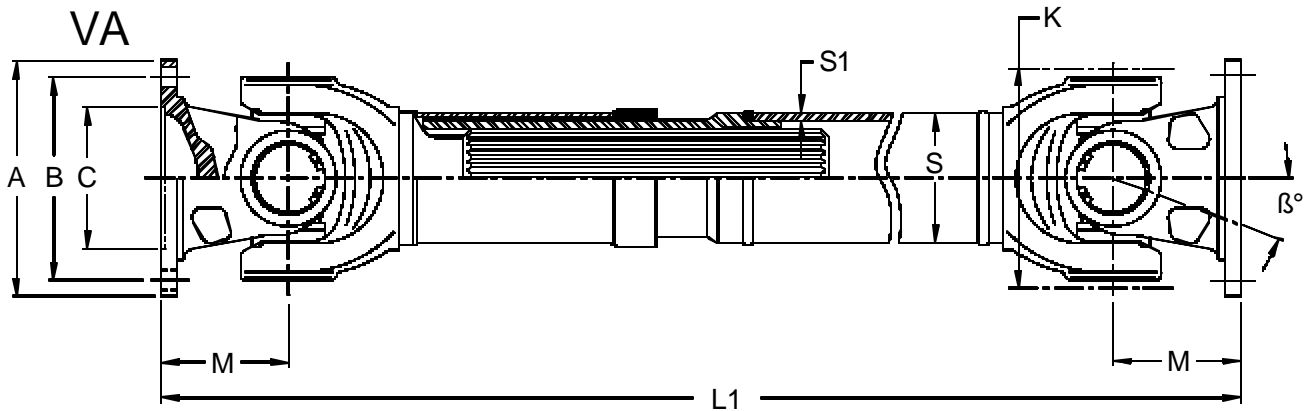
L2 = +/- SLIP MOVEMENT

L3 = MINIMUM FIXED LENGTH (TUBULAR DESIGN, OTHER LENGTHS AVAILABLE)

L4 = MINIMUM MIDSLIP LENGTH (SHORT COUPLE DESIGN)

OTHER TUBE SIZES ARE AVAILABLE

FOR OTHER LENGTHS & DESIGNS, CONSULT JOHNSON POWER





Series	2265	2270	2275	2290	2295	2296
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TORQUE RATINGS / ALL TORQUE IN FT-LBS

TS	13276	24321	24321	29502	29502	32453
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DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES

A	8.86	8.86	9.84	9.84	11.22	11.22
Angle β°	30	24	24	20	20	20
B	7.716	7.716	8.583	8.583	9.646	9.646
C	5.512	5.512	5.512	5.512	6.890	6.890
H	.634	.634	.712	.712	.791	.791
I (# Bolt Holes)	8	8	8	8	8	8
K	8.03	8.46	8.46	9.84	9.84	10.43
M	4.33	4.25	4.25	4.92	4.92	5.32
S (Std)	5.500	5.625	5.625	6.625	6.625	6.750
S1 (Std)	.250	.313	.313	.313	.313	.500
WT/IN (Std Tube)	1.167	1.480	1.480	1.756	1.756	2.782

MODEL VA - SHAFT WITH STANDARD LENGTH COMPENSATION

L1 (Midslip)	34.25	33.66	33.66	35.04	35.04	36.22
L2 (±)	2.76	2.17	2.17	1.97	1.97	1.97
COMP WT (Lbs.)	183.0	167.6	174.2	260.1	269.0	291.0

MODEL VB - STUB SHAFT WITH NO LENGTH COMPENSATION

D	7.56	7.56	7.56	8.31	9.87	9.87
E	5.19	5.18	5.18	5.18	4.82	4.82
F	8.97	8.96	8.96	9.33	9.76	9.76
G	3.187	3.187	3.187	3.437	3.937	3.937
L3	25.34	25.67	25.67	27.79	30.31	30.90
COMP WT (Lbs.)	142.9	148.5	149.5	207.8	243.9	252.7

MODEL SC - SHORT SHAFT WITH LENGTH COMPENSATION

L4	31.97	30.39	30.39	33.07	33.07	34.25
L2 (±)	2.17	2.17	2.17	1.97	1.97	1.97

L1 = MINIMUM MIDSLIP LENGTH (TUBULAR DESIGN, LONGER LENGTHS AVAILABLE)

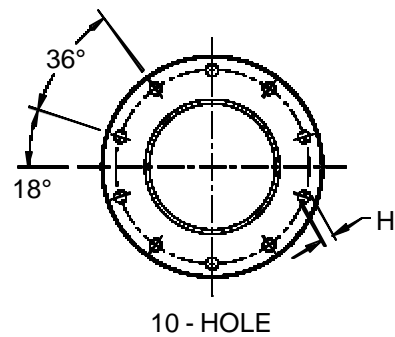
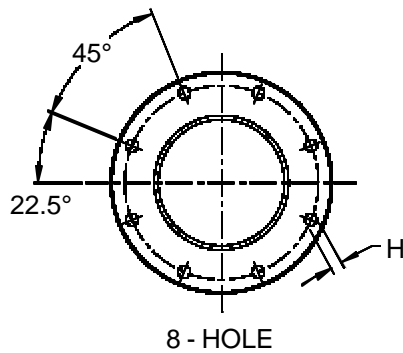
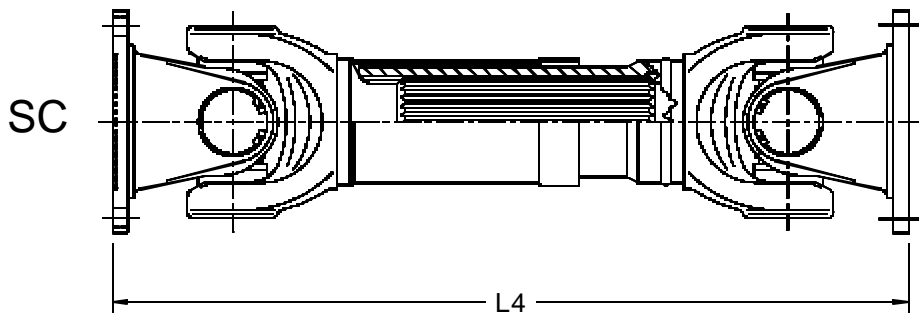
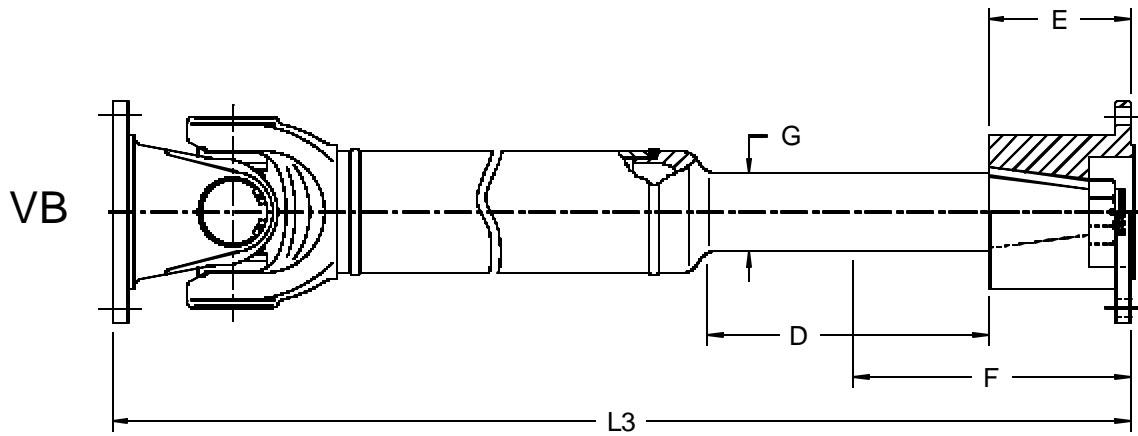
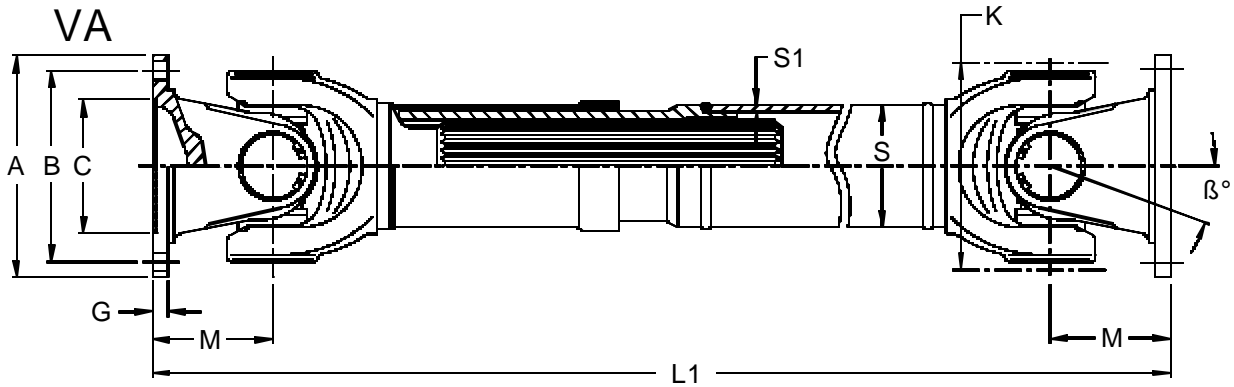
L2 = +/- SLIP MOVEMENT

L3 = MINIMUM FIXED LENGTH (TUBULAR DESIGN, OTHER LENGTHS AVAILABLE)

L4 = MIDSLIP LENGTH (SHORT COUPLE DESIGN, SHORTER LENGTHS AVAILABLE)

OTHER TUBE SIZES ARE AVAILABLE

FOR OTHER LENGTHS & DESIGNS, CONSULT JOHNSON POWER





Series	2325	2330	2350	2365	2390	2395
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TORQUE RATINGS / ALL TORQUE IN FT-LBS

TS	5674	7738	9581	14003	19899	19899
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DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES

A	5.91	5.91	7.09	7.09	7.09	8.86
Angle β°	25	25	25	25	25	25
B	5.118	5.118	6.122	6.122	6.122	7.717
C	3.543	3.543	4.331	4.331	4.331	5.512
H	.476	.476	.555	.634	.634	.634
I (# Bolt Holes)	8	8	8	10	10	8
K	5.59	6.22	6.77	7.01	8.03	8.03
M	3.74	4.02	3.74	4.53	4.33	4.33
S (Std)	4.000	4.750	4.750	4.750	5.625	5.625
S1 (Std)	.156	.125	.188	.250	.313	.313
WT/IN (Std Tube)	.534	.514	.763	1.000	1.480	1.480

MODEL VA - SHAFT WITH STANDARD LENGTH COMPENSATION

L1 (Midslip)	25.08	25.24	25.60	28.23	29.18	29.18
L2 (\pm)	2.17	2.17	2.17	2.17	2.17	2.17
COMP WT (Lbs.)	52.9	63.3	78.7	97.0	133.6	142.4

MODEL VB - STUB SHAFT WITH NO LENGTH COMPENSATION

D	8.00	8.00	8.00	8.00	7.56	7.56
E	3.67	3.67	4.42	4.42	4.66	5.19
F	7.67	7.67	8.42	8.42	8.44	8.97
G	2.187	2.187	2.937	2.937	3.187	3.187
L3	21.86	22.73	23.40	24.38	24.83	25.34
COMP WT (Lbs.)	47.8	53.1	84.9	97.0	112.1	142.9

MODEL SC - SHORT SHAFT WITH LENGTH COMPENSATION

L4	23.31	23.46	23.82	26.46	27.40	27.40
L2 (\pm)	2.17	2.17	2.17	2.17	2.17	2.17

L1 = MINIMUM MIDSLIP LENGTH (TUBULAR DESIGN, LONGER LENGTHS AVAILABLE)

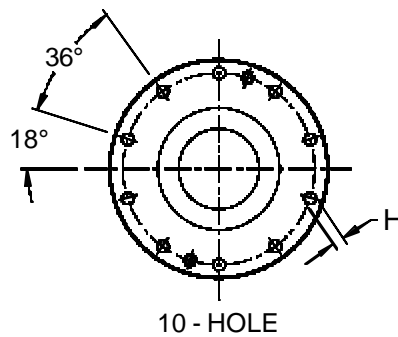
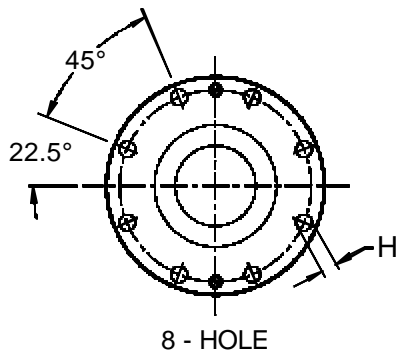
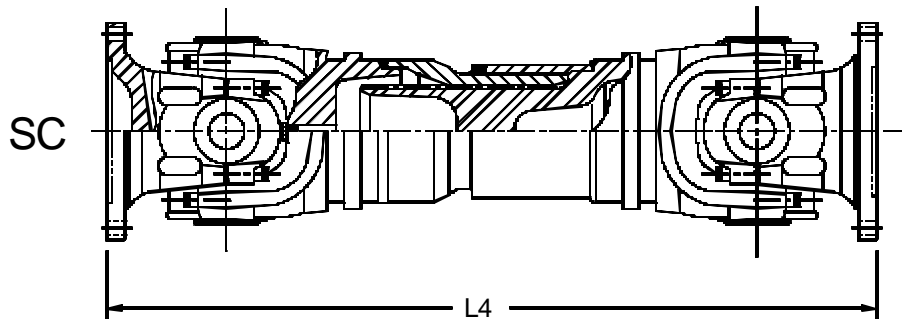
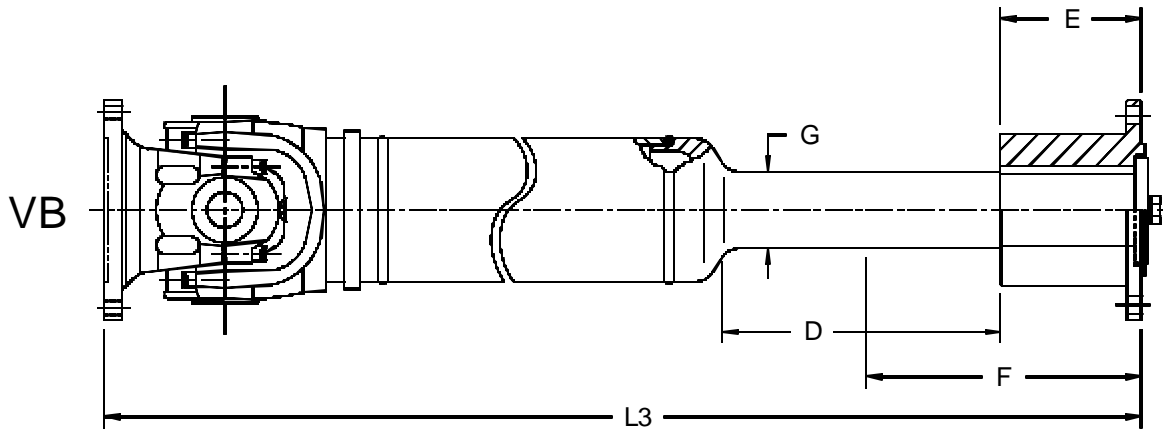
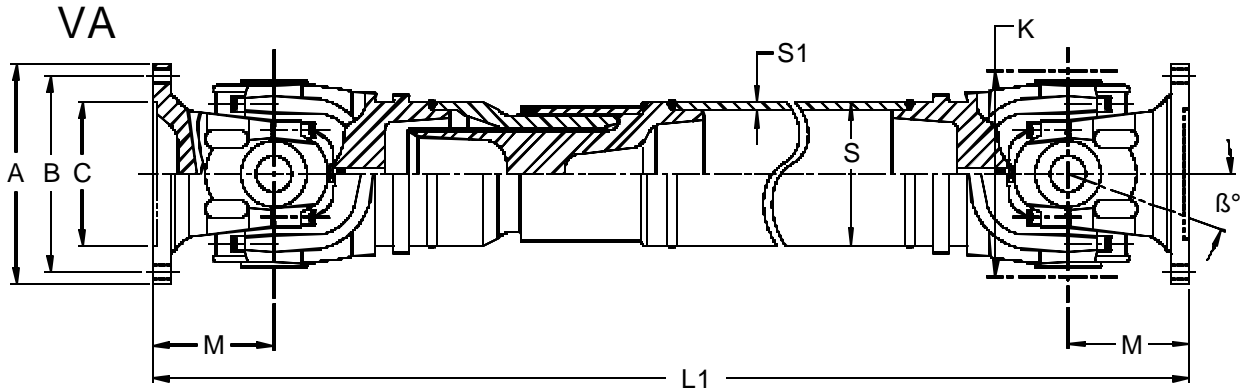
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L3 = MINIMUM FIXED LENGTH (TUBULAR DESIGN, OTHER LENGTHS AVAILABLE)

L4 = MIDSLIP LENGTH (SHORT COUPLE DESIGN, SHORTER LENGTHS AVAILABLE)

OTHER TUBE SIZES ARE AVAILABLE

FOR OTHER LENGTHS & DESIGNS, CONSULT JOHNSON POWER





Series	3220	3230	3240	3250	3260
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TORQUE RATINGS / ALL TORQUE IN FT-LBS

TS	34665	51629	75231	106946	143824
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DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES

A	11.22	12.40	13.78	15.35	17.13
Angle β°	15	15	15	15	15
B	9.646	11.024	12.205	13.583	15.157
C	6.890	6.890	8.661	9.843	11.024
H	.791	.870	.870	.949	1.067
I (# Bolt Holes)	8	8	10	10	10
K	9.44	10.43	11.81	12.99	14.56
M	5.32	5.91	6.69	7.48	8.27
S (Std)	6.750	8.750	8.750	10.750	10.750
S1 (Std)	.500	.500	.625	.750	.750
WT/IN (Std Tube)	2.782	3.672	6.890	6.668	6.668

MODEL VA - SHAFT WITH STANDARD LENGTH COMPENSATION

L1 (Midslip)	36.22	41.24	44.78	50.98	53.74
L2 (\pm)	1.97	2.66	2.66	3.35	3.35
COMP WT (Lbs.)	293.2	456.4	588.6	875.2	1051.6

MODEL VB - STUB SHAFT WITH NO LENGTH COMPENSATION

D	9.87	15.75	14.62	13.38	13.00
E	4.82	6.26	9.10	7.85	8.52
F	9.76	14.14	16.41	14.54	15.02
G	3.937	5.187	5.937	6.00	7.00
L3	32.25	41.00	45.00	44.50	46.00
COMP WT (Lbs.)	293.2	512.1	697.3	803.0	1036.2

MODEL SC - SHORT SHAFT WITH LENGTH COMPENSATION

L4	35.24	40.26	43.11	49.61	52.36
L2 (\pm)	1.97	2.66	2.66	3.35	3.35
WEIGHT (Lbs.)	288.8	449.7	579.8	864.2	1040.5

L1 = MINIMUM MIDSLIP LENGTH (TUBULAR DESIGN, LONGER LENGTHS AVAILABLE)

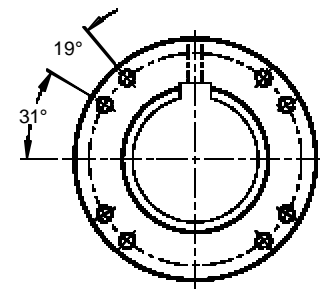
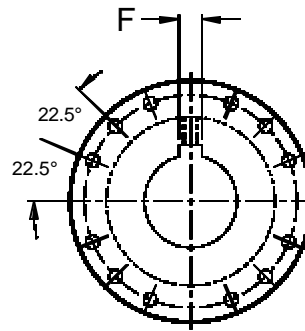
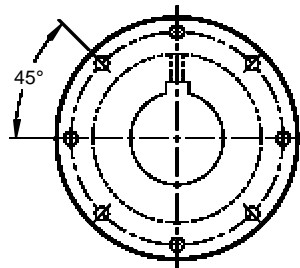
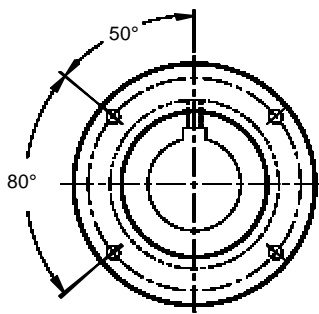
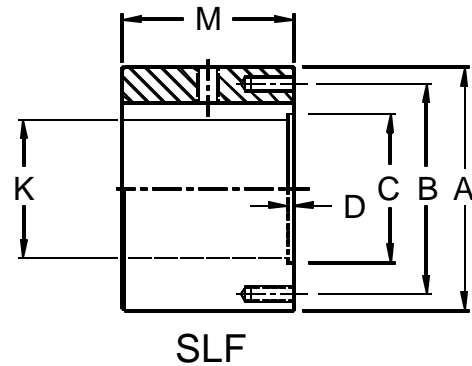
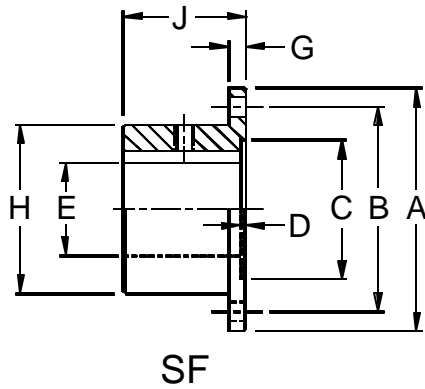
L2 = +/- SLIP MOVEMENT

L3 = MINIMUM FIXED LENGTH (TUBULAR DESIGN, OTHER LENGTHS AVAILABLE)

L4 = MIDSLIP LENGTH (SHORT COUPLE DESIGN, SHORTER LENGTHS AVAILABLE)

OTHER TUBE SIZES ARE AVAILABLE

FOR OTHER LENGTHS & DESIGNS, CONSULT JOHNSON POWER



MOTOR FLANGE WITH CIRCULAR KEY

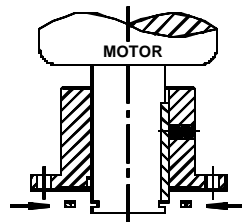


FIG. 1 SLIDE (TAP) FLANGE ON SO THAT IT CLEARS CIRCULAR KEY GROOVE.

INSTALL EACH CIRCULAR KEY HALF.

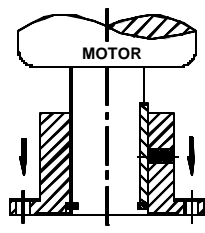
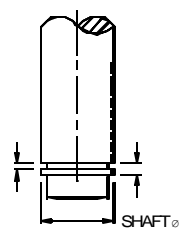
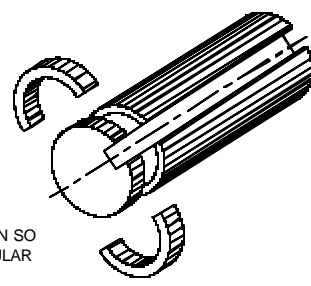


FIG. 2 LOWER FLANGE SO THAT WEIGHT IS SUSPENDED ON CIRCULAR KEY.

TIGHTEN SET SCREW(S) PER SPECIFICATION



CUSTOMER REFERENCE DIMENSIONS PER APPLICATION REQUIREMENTS



Series	31	37-41	48-55	61	71	81	88
DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES							
A	3.88	4.56	5.88	6.88	8.00	8.00	9.63
B	3.125	3.750	4.750	6.125	7.250	7.250	8.250
C	2.375	2.750	3.750	6.625	7.750	7.750	7.000
D	.078	.078	.093	.063	.063	.063	.140

MODEL SF (STANDARD FLANGE)

E MAX BORE	1.687	1.875	2.437	3.125	4.000	4.000	4.625
F MAX KEYWAY	.375	.500	.625	.750	1.000	1.000	1.125
G	.375	.375	.375	.375	.375	.375	.625
H	2.437	2.875	3.750	5.250	6.375	6.375	6.875
J	2.000	2.000	2.500	3.500	4.000	4.000	5.000
MIN BORE	.750	1.000	1.250	1.250	1.250	1.250	1.500
MAX WEIGHT	3.14	4.25	8.61	21.78	36.56	36.56	56.12

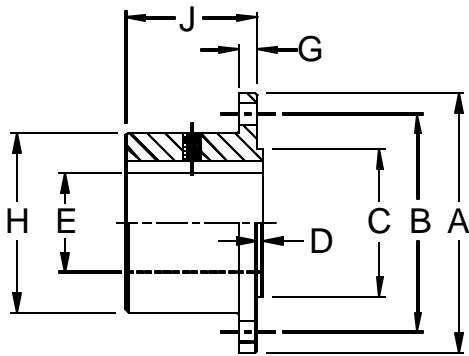
MODEL SLF (SPECIAL LARGE FLANGE)

K MAX BORE	2.375	2.750	3.750	4.500	5.500	5.500	6.375
F MAX KEYWAY	.625	.750	1.000	1.125	1.250	1.250	1.250
M	2.500	3.000	3.000	5.000	6.000	6.000	6.000
MIN BORE	1.375	1.750	2.375	3.125	3.500	3.500	4.250
MAX WEIGHT	7.33	11.8	22.4	41.5	68.8	68.8	99.1

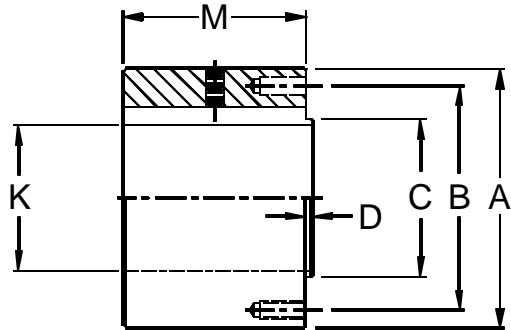
BOLT HOLE SPACING

STYLE	#1	#1	#1	#2	#2	#3	#4
# BOLTS	4	4	4	8	8	12	8
THREAD SIZE	3/8-24	7/16-20	1/2-20	3/8-24	3/8-24	7/16-20	5/8-18
BOLT TORQUE	30 lbs. ft.	50 lbs. ft.	75 lbs. ft.	30 lbs. ft.	30 lbs. ft.	50 lbs. ft.	210 lbs. ft.

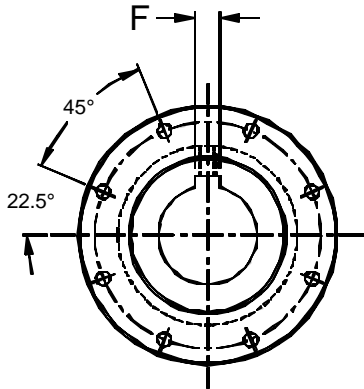
* Flange Selection: Select companion flange with the same "A" diameter and number of bolt holes as the U-Joint Shaft selected. Bore size will determine whether to use an SF or SLF style.



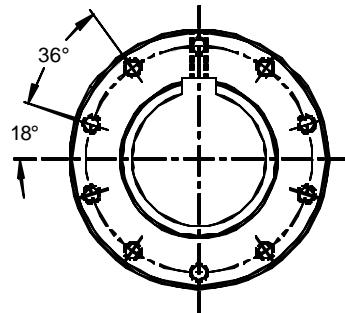
SF



SLF



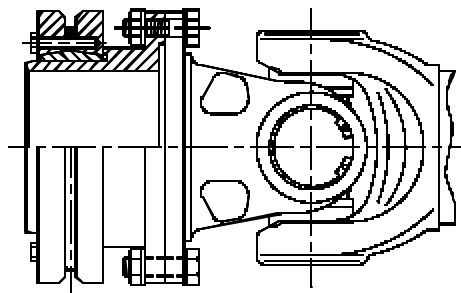
STYLE #1



STYLE #2

Design Option

External
Shrink Disk
Locking Device





Series	150	180-8	180-10
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DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES

A	5.91	7.09	7.09
B	5.118	6.122	6.122
C	3.543	4.331	4.331
D	.082	.082	.082

MODEL SF (STANDARD FLANGE)

E-MAX BORE	2.875	3.500	3.500
F-MAX KEYWAY	.750	.875	.875
G	.375	.500	.500
H	4.312	5.187	5.125
J	3.000	4.000	4.000
MIN BORE	1.000	1.250	1.250
MAX WEIGHT	14.00	24.0	24.0

MODEL SLF (SPECIAL LARGE FLANGE)

K-MAX BORE	3.375	4.125	4.125
F-MAX KEYWAY	.875	1.000	1.000
M	4.000	4.500	4.500
MIN BORE	2.250	2.750	2.750
MAX WEIGHT	27.0	41.0	41.0

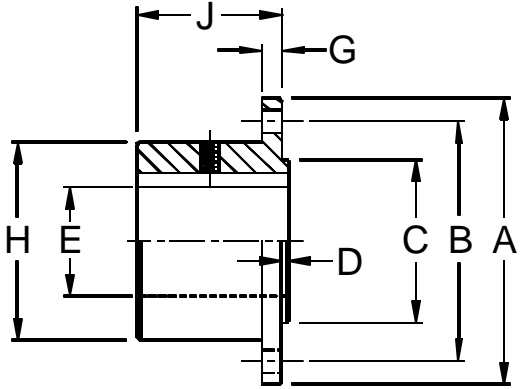
BOLT HOLE SPACING

STYLE	#1	#1	#2
# BOLTS	8	8	10
THREAD SIZE	M12	M14	M16
BOLT TORQUE	90 lbs. ft.	140 lbs. ft.	210 lbs. ft.

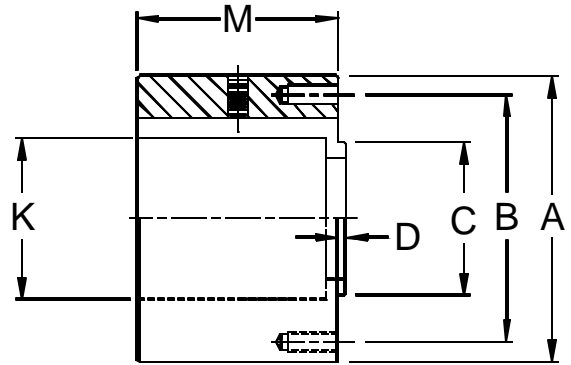
FITS JOINT SERIES

	2325	2350	2365
	2330		2390

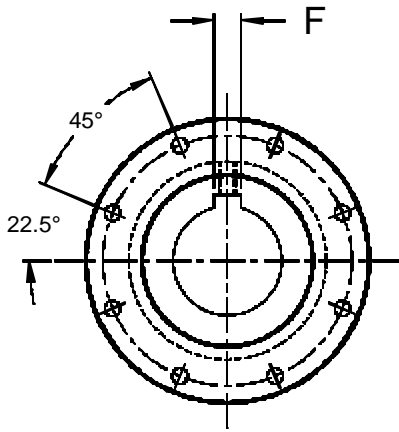
* Flange Selection: Select companion flange with the same "A" diameter and number of bolt holes as the U-Joint Shaft selected. Bore size will determine whether to use an SF or SLF style.



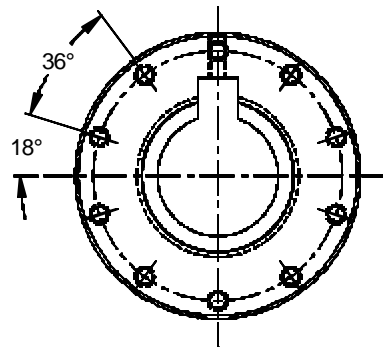
SF



SLF



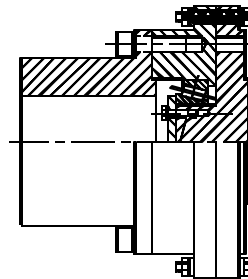
STYLE #1



STYLE #2

Design Option

Shear Pin Assembly





Series	225	250	285	315	350	390	435
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DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES

A	8.86	9.84	11.22	12.40	13.78	15.35	17.13
B	7.716	8.583	9.646	11.024	12.205	13.583	15.157
C	5.512	5.512	6.890	6.890	8.661	9.843	11.024
D	.157	.197	.236	.236	.276	.276	.354

MODEL SF (STANDARD FLANGE)

E MAX BORE	4.437	4.937	5.562	6.437	7.250	8.062	8.937
F MAX KEYWAY	1.000	1.250	1.500	1.750	2.000	2.250	2.250
G	.625	.750	.812	.875	1.000	1.125	1.250
H	6.687	7.437	8.375	9.687	10.875	12.093	13.468
J	5.500	6.000	7.000	8.000	9.000	10.000	11.000
MIN BORE	1.500	2.000	2.000	2.250	2.500	2.750	3.000
MAX WEIGHT	56.1	76.0	113.2	169.0	239.2	361.8	450.1

MODEL SLF (SPECIAL LARGE FLANGE)

K-MAX BORE	5.875	6.562	7.500	8.250	9.000	10.000	11.375
F MAX KEYWAY	1.500	1.500	2.000	2.250	2.250	2.500	2.500
M	7.25	8.25	9.38	10.25	11.25	AS REQ'D	AS REQ'D
MIN BORE	2.000	2.250	2.500	2.750	3.000	3.250	3.500
MAX WEIGHT	119.5	167.8	248.1	331.8	450.6	---	---

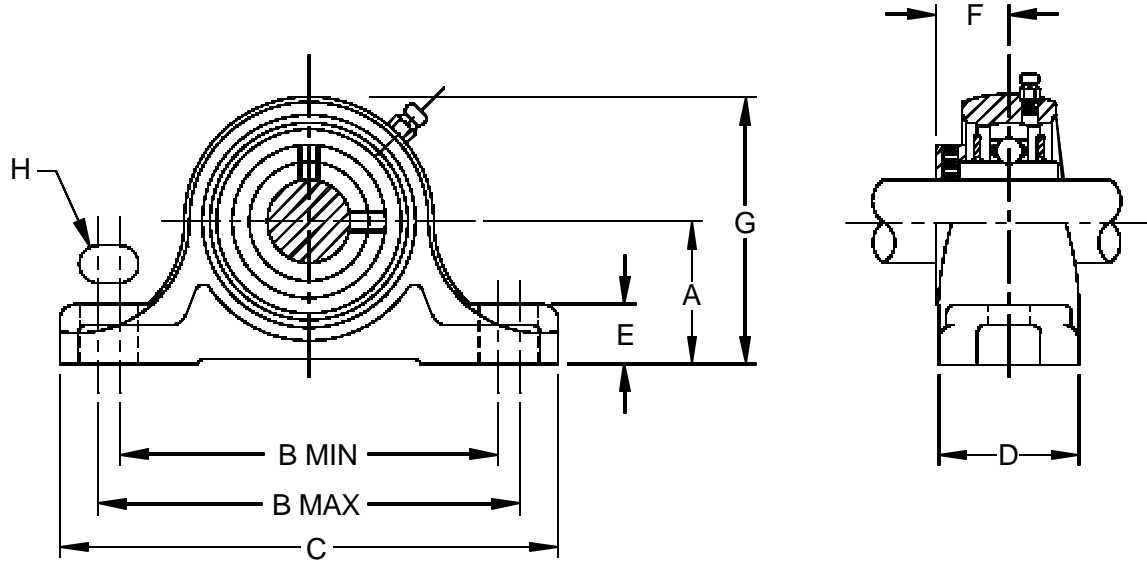
BOLT HOLE SPACING

STYLE	#1	#1	#1	#1	#2	#2	#2
# BOLTS	8	8	8	8	10	10	10
THREAD SIZE	M16	M18	M20	M22	M22	M24	M27
BOLT TORQUE	218 lbs. ft.	298 lbs. ft.	428 lbs. ft.	575 lbs. ft.	575 lbs. ft.	738 lbs. ft.	1106 lbs. ft.

FITS JOINT SERIES

	2265	2275	2295	3230	3240	3250	3260
	2270	2290	2296				
	2395		3220				

* Flange Selection: Select companion flange with the same "A" diameter and number of bolt holes as the U-Joint Shaft selected. Bore size will determine whether to use an SF or SLF style.



Heavy Duty Bearing Option Available

Series	PB1-3/16	PB1-7/16	PB1-11/16	PB1-15/16	PB2-3/16	PB2-7/16	PB2-15/16	PB3-3/16	PB3-7/16
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DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES

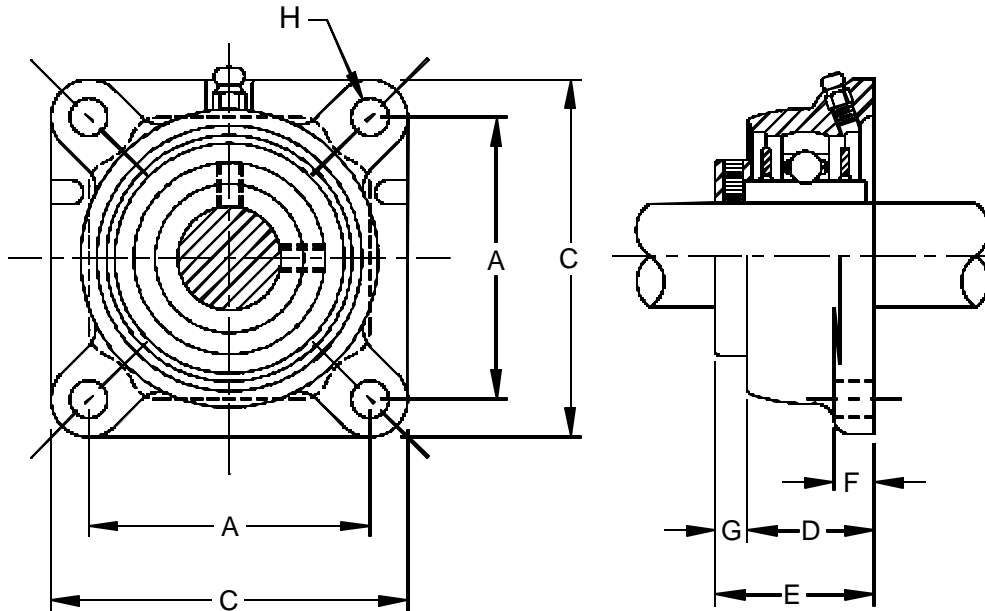
SHAFT DIA.	1-3/16	1-7/16	1-11/16	1-15/16	2-3/16	2-7/16	2-15/16	3-3/16	3-7/16
A	1.687	1.875	2.125	2.250	2.500	2.750	3.500	4.000	4.000
B-MIN.	4.188	4.656	5.250	5.906	6.406	6.906	8.125	9.812	9.812
B-MAX.	5.063	5.594	6.500	6.531	7.469	8.156	10.125	11.937	11.937
C	6.187	6.563	7.531	7.875	8.750	9.625	12.000	14.000	14.000
D	1.750	1.750	2.000	2.187	2.312	2.375	2.875	3.375	3.375
E	.656	.719	.750	.750	.812	1.062	1.219	1.344	1.344
F	.906	1.016	1.125	1.219	1.250	1.312	1.469	1.563	1.563
G	3.281	3.687	4.187	4.500	4.969	5.469	6.656	7.875	7.875
H-BOLT	1/2	1/2	1/2	5/8	5/8	5/8	7/8	7/8	7/8
WEIGHT	2.52	3.35	4.55	5.60	6.66	9.76	16.73	28.41	27.52
THRUST (LBS.)	145	190	260	260	322	390	490	715	715

FITS VB SHAFT SERIES

	31	41	48	55	71	81	88	2260	2290
	37		2200	61	2220		2240	2265	
	2300		2210	2315	2230		2250	2270	
	2305		2310	2320	2325		2350	2275	
					2330		2365	2390	
								2395	

**THRUST LOADS BASED ON 15000 HOURS AT 1750 R.P.M.
 THRUST LOADS INCREASE AS R.P.M. DECREASES
 IF OVER SIZE TUBING IS USED STAND OFF SHIMS MAY BE REQUIRED**

OPTIONAL BEARING CONFIGURATIONS AVAILABLE PER PROJECT SPECIFICATIONS



Heavy Duty Bearing Option Available

Series	FB1-3/16	FB1-7/16	FB1-11/16	FB1-15/16	FB2-3/16	FB2-7/16	FB2-15/16	FB3-3/16	FB3-7/16
DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES									
SHAFT DIA.	1-3/16	1-7/16	1-11/16	1-15/16	2-3/16	2-7/16	2-15/16	3-3/16	3-7/16
A	3.250	3.625	4.125	4.375	5.125	5.625	6.000	6.750	6.750
C	4.250	4.625	5.375	5.625	6.375	6.875	7.750	8.437	8.437
D	.844	.969	1.125	1.125	1.219	1.438	1.687	2.062	2.062
E	1.344	1.500	1.719	1.813	1.891	2.094	2.406	2.734	2.734
F	.563	.594	.625	.656	.719	.687	.750	.937	.937
G	.500	.531	.594	.688	.672	.656	.719	.672	.672
H-BOLT	7/16	1/2	1/2	5/8	5/8	5/8	3/4	3/4	3/4
WEIGHT	2.62	2.98	4.94	5.63	6.53	8.89	13.19	21.11	20.22
THRUST(LBS.)	145	190	260	260	322	390	490	715	715

FITS VB SHAFT SERIES

	31	41	48	55	71	81	88	2260	2290
	37		2200	61	2220		2240	2265	
	2300		2210	2315	2230		2250	2270	
	2305		2310	2320	2325		2350	2275	
					2330		2365	2390	
								2395	

THRUST LOADS BASED ON 15000 HOURS AT 1750 R.P.M.
THRUST LOADS INCREASE AS R.P.M. DECREASES
IF OVER SIZE TUBING IS USED STAND OFF SHIMS MAY BE REQUIRED

OPTIONAL BEARING CONFIGURATIONS AVAILABLE PER PROJECT SPECIFICATIONS



PUMP MOUNTED SAFETY GUARD

Series	SGR-1	SGR-1A	SGR-2	SGR-3	SGR-3A	SGR-4
DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES						
A	10.00	10.00	14.00	20.00	20.00	24.00
B	12.00	16.00	16.00	22.00	24.00	30.00
C	2.75	4.00	4.00	7.00	8.00	9.00
D (Slot Width)	.500	.625	.625	.625	.625	.625
E (Bolt Hole Pattern)	4.00 to 10.00	5.50 to 13.75	5.50 to 13.75	10.00 to 19.00	10.00 to 22.00	11.00 to 28.00
F (Std. Length)	48.00	48.00	48.00	48.00	48.00	48.00

FLOOR MOUNTED SAFETY GUARD

Series	FGR-1	FGR-2	FGR-3
DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES			
A	10.00	14.00	20.00
F (Std. Length)	84.00	84.00	84.00

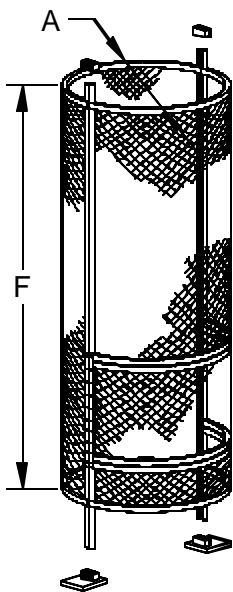
Notes:

- 1). Optional lengths available from 24" to 96"
- 2). Longer spans than 96" require multiple guards bolted together.
- 3). Hinged access doors available as options.
- 4). Ceiling mount brackets available as option.

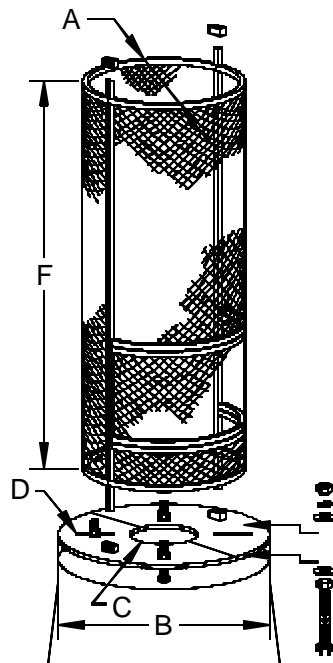
Standard guards are made from 18 GA-1/2" expanded metal mesh. Galvanizing, aluminum, and stainless steel available as options.

PUMP MOUNTING KITS

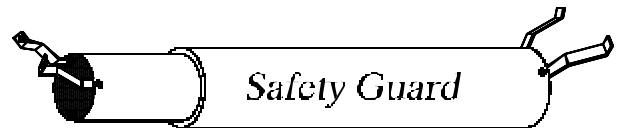
Series	MK-03	MK-05	MK-06	MK-07	MK-08	MK-10	MK-11
DIMENSIONAL DATA / ALL DIMENSIONS IN INCHES							
Thread Size	3/8-16NC	1/2-13NC	5/8-11NC	3/4-10NC	7/8-9NC	1-8NC	1-1/8-7NC
Stud Length	4.00	4.00	4.50	5.00	5.50	5.50	6.00



Floor Mounted Safety Guard



Pump Mounted Safety Guard



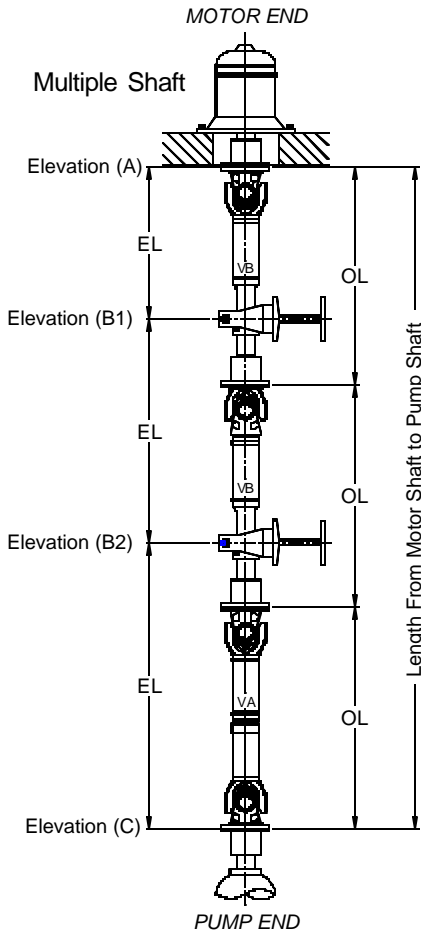
HORIZONTAL SAFETY GUARDS			
PART NO.	LENGTH	FOR SHAFT SERIES	DIA.
GH-18	10" to 18"	31 thru 55	7"
GH-24	14" to 24"	61 thru 81	12"
GH-42	24" to 42"	31 thru 55	7"
GH-66	35" to 66"	31 thru 55	7"
GH-71	35" to 66"	61 thru 81	12"
GH-91	28" to 54"	88 thru 95	15"

Horizontal Safety Guards are manufactured from 18 gauge galvanized steel and telescope in 1" increments. A lube opening is provided on the underside of the guard. Select the guard to compliment the universal joint series and length required.



JOHNSON POWER SHAFT SELECTION INFORMATION

For free computer assisted selection and quotation, call us at (708) 345-4300 or fax us at (708) 345-4315 with the following data:



1. Horsepower _____
2. RPM _____ (Constant or Variable?)
In variable speed applications, provide min. & max. speed. _____
Driver: Electric Motor Diesel Engine(with clutch?)
3. Distance from motor shaft to pump shaft _____
4. Elevation locations of steady bearings and motor and pump shafts where multiple shafts are required
Motor Shaft Elevation (A) _____
Steady Bearing Elevations (B1) _____
(B2) _____
(B3) _____
Pump Shaft Elevation (C) _____
5. Number of impeller vanes _____
6. B-10 bearing life required _____
7. Copy of specifications when applicable

Safety Guards:

- Pump Mounted x 48" Floor Mounted x 84"
 Full Length Other _____

Torsional Analysis:

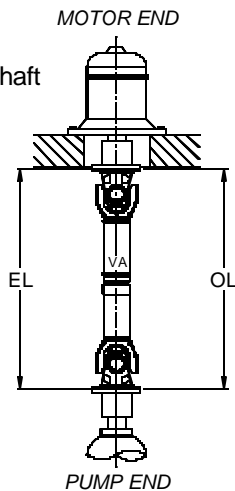
To verify that the final selection is not operating in an area of torsional excitation please also provide:

1. WR^2 - Mass moment of inertia for motor and pump (lb.-ft.²)
Motor WR^2 _____
Pump WR^2 _____
2. Spring Rate - Torsional stiffness for motor and pump (in.-lbs./radian)
Motor Spring Rate _____
Pump Spring Rate _____

Customer/Project Information

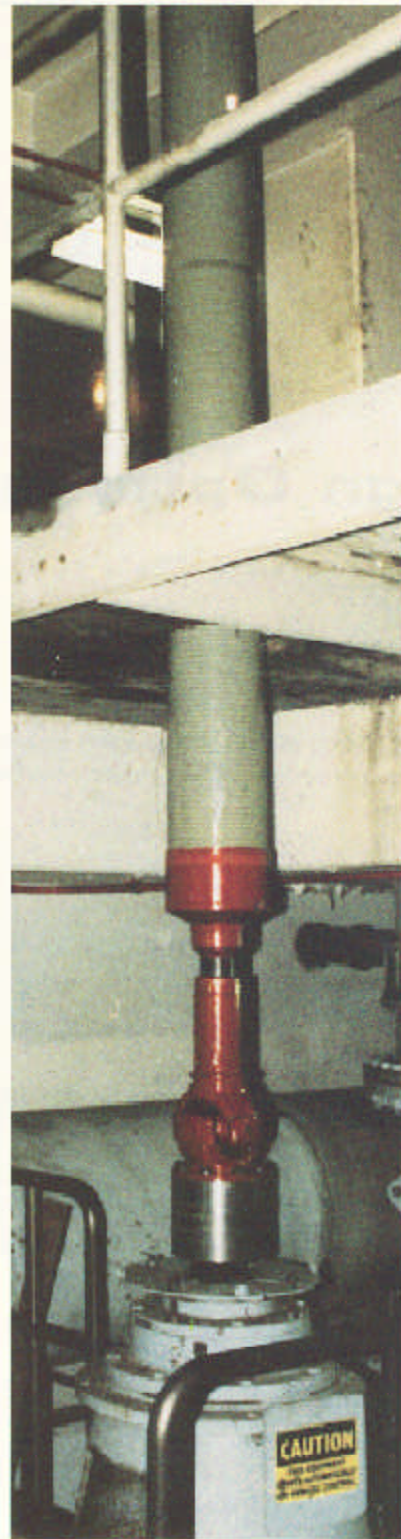
Company: _____ Contact: _____
Phone: _____ Fax: _____
Address: _____
City: _____ State: _____ Zip: _____
Email: _____
Project Reference: _____

Single Shaft



Design Options / Composite Tubing

Composite tubing is available in a wide range of diameters to compliment the Johnson Power universal joint line.



Composite tubing offers...

- Light weight (1/5 of steel tubing)
- Higher critical speeds
- Longer shaft lengths
- Corrosion resistance
- Isolation of electric current
- Reduced stress on mating components



JOHNSON POWER LTD.

POWER THROUGH PERFORMANCE

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