



**LONE STAR**  
ARTIFICIAL LIFT SYSTEMS



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Lone Star Artificial Lift Systems, LLC  
1808 W. Sam Houston Parkway N.  
Houston, TX 77043  
Tel: 832.831.1495  
Fax: 831.831.7362  
[www.LoneStarALS.com](http://www.LoneStarALS.com)

**Pumping Units**

Catalog 2014





### We own the designs, so you get parts when you need them.

Unlike other companies selling Chinese manufactured equipment, Lone Star ALS owns its drawings, design and brand name. We are not a reseller or distributor subject to manufacturing issues created by third parties who can cut off supply at any time. We've integrated design and manufacturing to control the quality and delivery of new units as well as parts.

#### Detailed records and on-demand manufacturing

We keep a detailed database of all parts in all Lone Star units sold in the United States as well as a complete inventory of all parts in our various stocking sites. If a part is out of stock, we can manufacture it on demand right

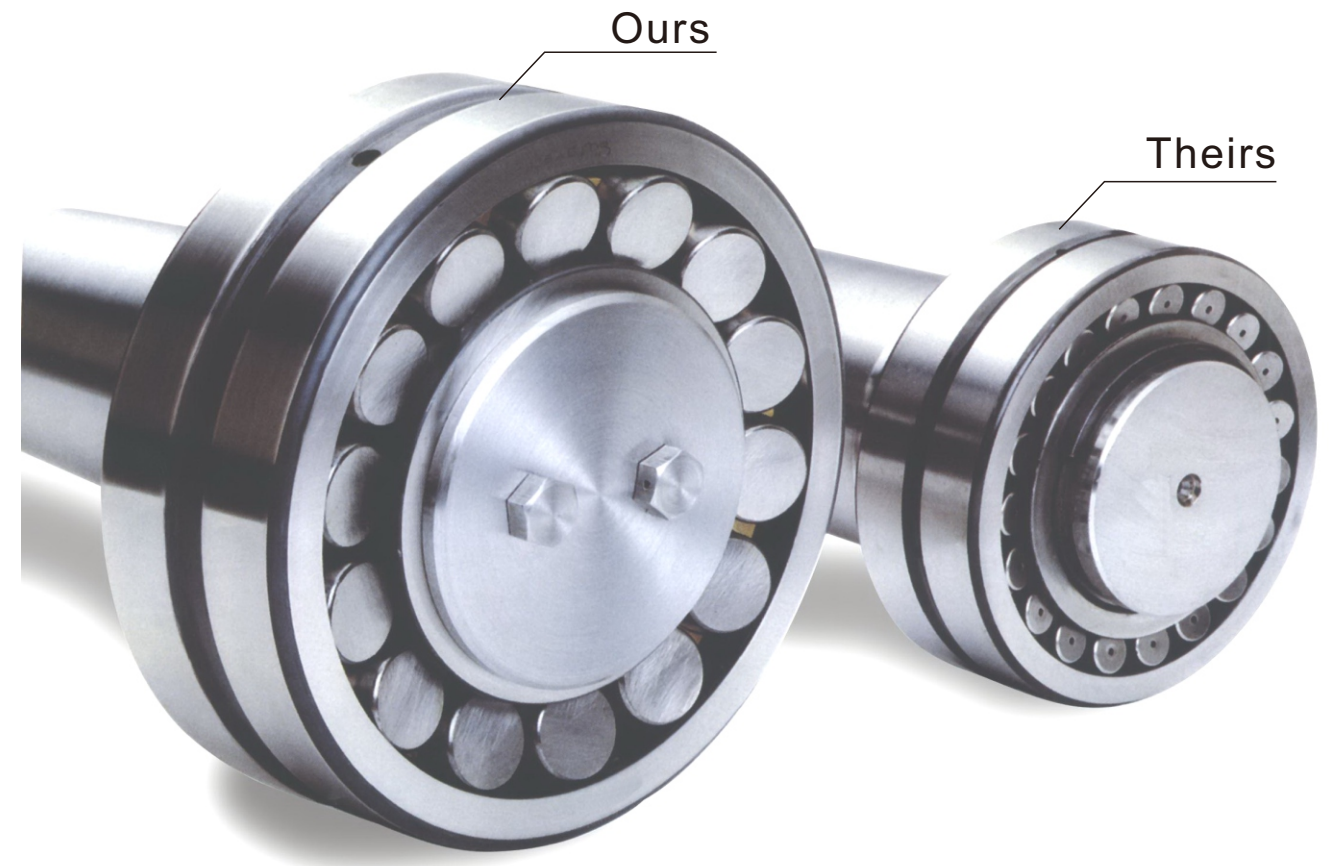
### Reliability

#### Our job is to keep your wells producing

The design of the Lone Star pumping unit is the culmination of over 35 years of experience in manufacturing in China and selling in the United States and in international markets. Our knowledge of raw material supply, manufacturing processes, and material fatigue properties has been incorporated into the Lone Star unit design, resulting in the most dependable pumping unit made in China.

#### Expertise and a quick response

Whether you're purchasing a brand new pumping unit or need a replacement part for an Lone Star pumping unit, you'll find best-in-class contractors ready to help get you up and running — and keep you there. Our service partners are best-in-class experts who know Lone Star pumping units and have quick access to a vast inventory of spare parts and on-demand manufacturers. If we don't have the part in stock, we can make it for you within days.



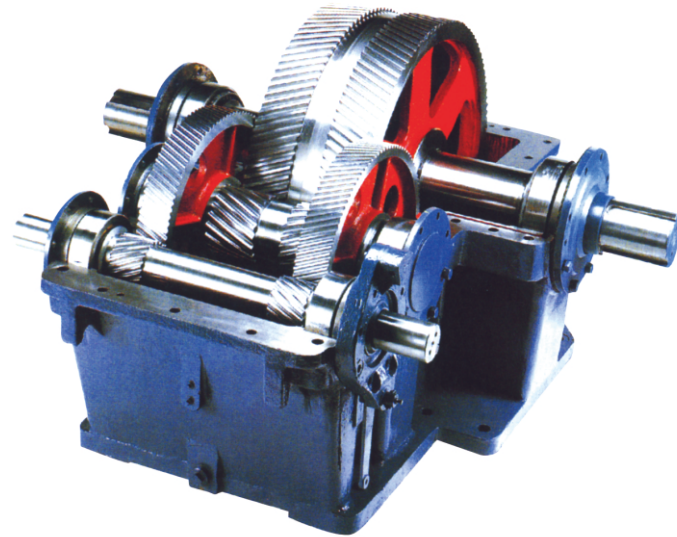
## Crank Pin Bearing Assemblies

Both of the crank pins and bearings pictured above are from API model size 456 conventional pumping units. The one on the left is from Lone Star ; the one on the right is standard size for many other manufacturers .

Lone Star crank pin assemblies are designed with double-row, self-aligning bearings which, due to their size, insure the longest wear life expectancy in the industry. Special features , such as high alloy steel tapered inserts installed permanently in each crank hole, all but eliminate failure and downtime.



## Gear Reducer



### Our Standard DCA Gear Reducer Provides More Torque

Lone Star ALS and its predecessor companies pioneered the use and acceptance of Double Circular Arc (DCA) gear reducers around the world. The unique DCA tooth design allows for a greater area of tooth-to-tooth contact resulting in lower gear tooth pressure and greater pitting resistance than with involute gears. Lone Star gear reducers with DCA gears have greater torque capacity than the same size involute gear reducers, with an average of 35% torque capacity over gear reducer name plate rating.

### Our Premium Gear Reducers carry a 5 year warranty

Lone Star ALS also offers our Premium 5-year warranty gear reducers with either DCA or Involute tooth form. Lone Star Premium gear reducers include gears constructed using high alloy forged steel gear blanks instead of standard cast steel or nodular cast iron. Gears are cut with a two-step process of rough cut-heat treat-finish cut, insuring deep penetration of the heat treatment deep within the gear tooth root. Lone Star Premium gear reducers carry our famous 5-year “no questions asked” warranty.

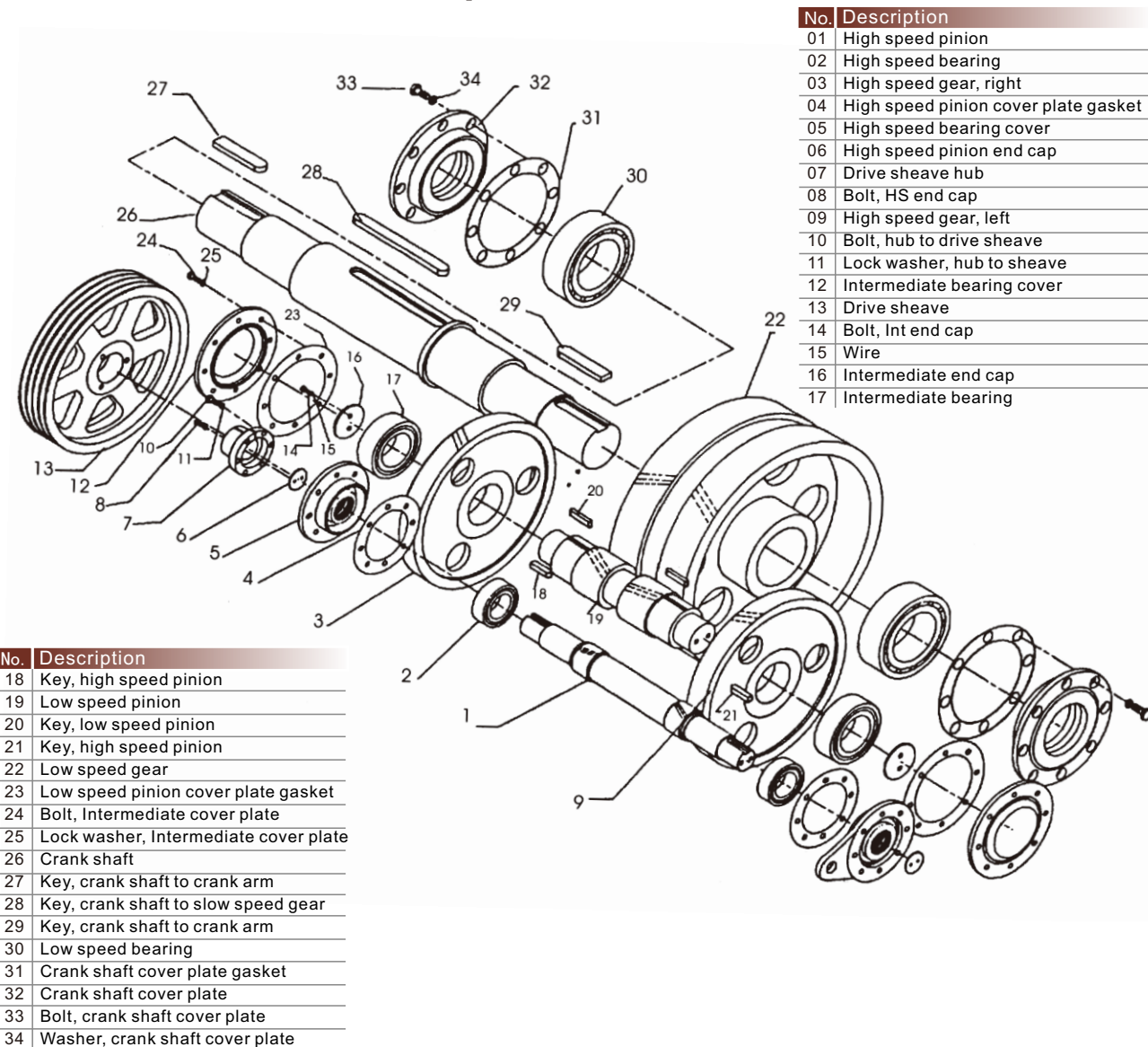
### Our Premium Gear Reducer





Peak Torque Rating Inch-Lbs	Ratio of Gears	Gear Box Oil Capacity US Gallons	Sheave Dimensions	Crankshaft Diameter Inches
1,280,000	28.85	243	4 3/4" Bore. 50", 55"-8C; 40", 48", 50"-6D	8 21/32
912,000	28.79	180	4 3/8" Bore. 50", 55"-8C; 40", 48", 50"-6D	7 7/8
640,000	28.36	106	4" Bore. 36", 44", 50"-6C; 48", 50"-4D	7 7/8
456,000	28.33	88	4 5/8" Bore. 36", 44", 50"-6C; 48", 50"-4D	7 7/8
320,000	28.81	75	3 5/8" Bore. 30", 36", 44"-5C	6 7/8
228,000	28.87	43	3" Bore. 24", 30", 36"-4C	6 7/8
160,000	28.51	37	2 5/8" Bore. 24", 30", 34"-3C	5 29/32
114,000	28.36	25	2 1/4" Bore. 20", 24", 30"-3C	5 1/8
80,000	28.93	21	2 1/8" Bore. 20", 24", 30"-2C	4 23/32
57,000	28.79	17	2 1/16" Bore. 20", 24", 30"-2C	3 15/16
40,000	28.41	14	2 1/16" Bore. 20", 24", 30"-2C	3 15/16

## Gear Reducer Exploded View



## Components

### Center Bearing Assembly

Center bearing assembly utilizes heavy duty, self-aligning, anti-friction bearings. The metal-to-metal seal is designed to eliminate damage resulting from over lubrication. All bearings and oil seals are readily available through standard suppliers.



### Equalizer Bearing Assembly

Our massive, double-row, self-aligning spherical bearing is encased in a rugged cast steel bearing housing to provide constant equalization of loads to the pitman arms and crank pins. Ground level lubrication systems are standard.



### Brake Assembly

Anti-skid brake system provides stopping power when engaged. Our cast steel, external brake design with safety lockout ensures operators of immediate and decisive brake response when needed.



### Crank Pin Bearing Assembly

Crank arms include precision tapered inserts which are permanently pressed into each crank pin hole, eliminating the possibility of improper installation of crank pin assemblies (no sleeves or keys needed)

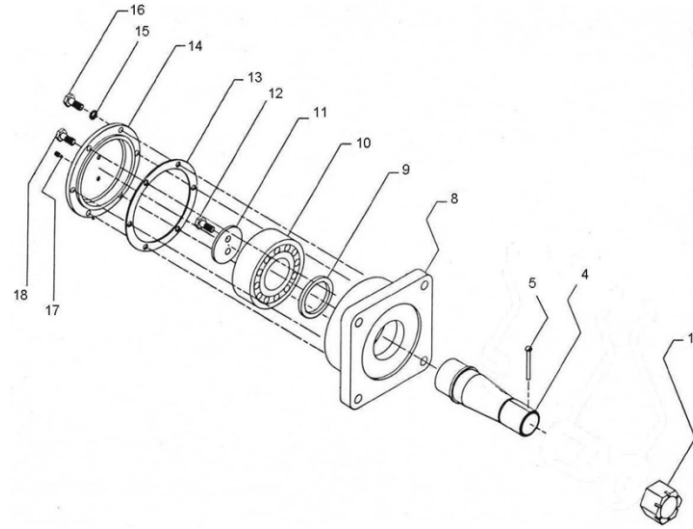




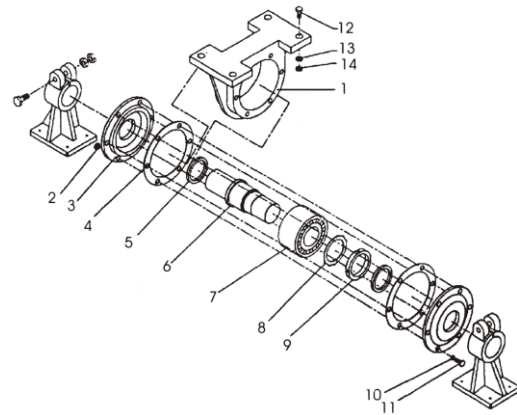
# Bearing Assemblies

## Crank Pin Bearing Assembly

No.	Description
01	Crank pin castle nut
04	Crank pin shaft
05	Crank pin cotter pin
07	Crank pin to banjo bolt
08	Crank pin housing
09	Crank pin oil seal
10	Crank pin bearing
11	Crank pin end plate
12	Crank pin end plate bolt
13	Crank pin gasket
14	Crank pin cover plate
15	Crank pin cover plate lock washer
16	Crank pin cover plate bolt
17	Crank pin grease zerk
18	Crank pin grease relief
19	Crank pin to banjo lock washer



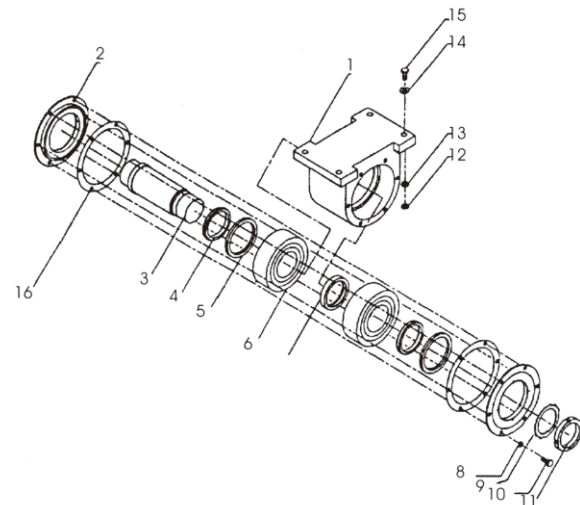
## Equalizer Bearing Assembly



No.	Description
01	Equalizer bearing housing
02	Equalizer bearing cover plate nut
03	Equalizer bearing cover plate
04	Equalizer bearing gasket
05	Equalizer bearing oil seal
06	Equalizer bearing pin shaft
07	Equalizer bearing
08	Equalizer bearing castle washer
09	Equalizer bearing pin shaft castle nut
10	Equalizer bearing cover plate lock washer
11	Equalizer bearing cover plate bolt
12	Equalizer bearing to walking beam bolt
13	Equalizer bearing to walking beam nut
14	Equalizer bearing to walking beam lock nut

## Center Bearing Assembly

No.	Description
01	Center bearing housing
02	Center bearing cover plate
03	Center bearing pin shaft
04	Center bearing sleeve
05	Center bearing oil seal
06	Center bearing
07	Center bearing spacer (between bearings)
08	Center bearing cover plate lock washer
09	Center bearing castle washer
10	Center bearing cover plate bolt
11	Center bearing pin shaft castle nut
12	Center bearing to walking beam lock nut
13	Center bearing to walking beam nut
14	Center bearing to walking beam washer
15	Center bearing to walking beam bolt
16	Center bearing gasket



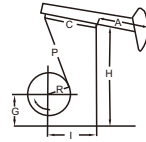
# Conventional Pumping Unit



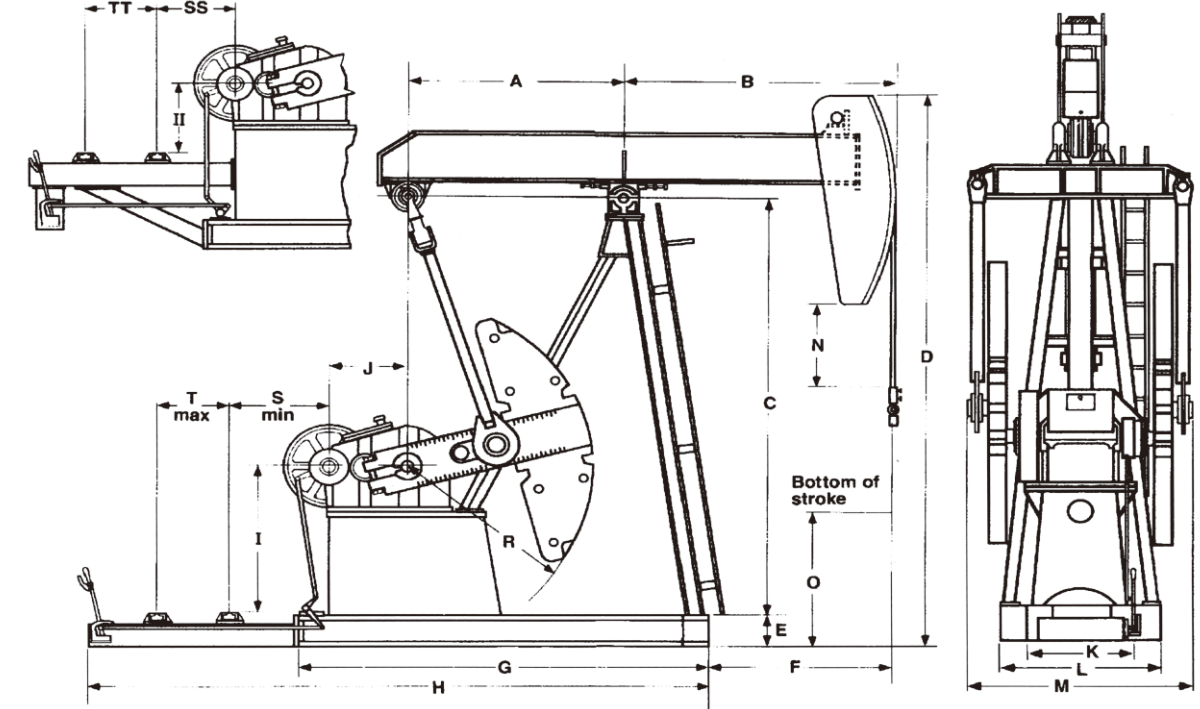
## Specifications

Unit Designation	Polished Rod Capacity, Lbs.	Stroke Length in Inches	Unit Designation	Polished Rod Capacity, Lbs.	Stroke Length in Inches
C-1824D-305-240	30,500	240, 206, 177	C-456D-213-120	21,300	120, 102, 84
C-1824D-427-216	42,700	216, 185, 159	C-456D-256-100	25,600	100, 85, 70
C-1824D-365-216	36,500	216, 185, 159	C-320D-256-144	25,600	144, 122, 101
C-1824D-365-192	36,500	192, 165, 138	C-320D-256-120	25,600	120, 102, 84
C-1280D-305-240	30,500	240, 206, 177	C-320D-213-120	21,300	120, 102, 84
C-1280D-365-192	36,500	192, 165, 138	C-320D-305-100	30,500	100, 85, 70
C-1280D-365-168	36,500	168, 144, 121	C-320D-256-100	25,600	100, 85, 70
C-1280D-305-168	30,500	168, 144, 121	C-320D-246-86	24,600	86, 74, 62
C-1280D-427-144	42,700	144, 123, 102	C-320D-213-86	21,300	86, 74, 62
C-1280D-365-144	36,500	144, 123, 102	C-320D-246-74	24,600	74, 64, 53
C-912D-305-240	30,500	240, 206, 177	C-228D-185-144	18,500	144, 122, 101
C-912D-365-192	36,500	192, 165, 138	C-228D-213-120	21,300	120, 102, 84
C-912D-365-168	36,500	168, 144, 121	C-228D-213-100	21,300	100, 86, 72
C-912D-305-168	30,500	168, 144, 121	C-228D-173-100	17,300	100, 86, 72
C-912D-427-144	42,700	144, 123, 102	C-228D-246-86	24,600	86, 74, 62
C-912D-365-144	36,500	144, 123, 102	C-228D-213-86	21,300	86, 74, 62
C-640D-365-168	36,500	168, 144, 121	C-228D-200-74	20,000	74, 64, 53
C-640D-305-168	30,500	168, 144, 121	C-228D-173-74	17,300	74, 64, 53
C-640D-365-144	36,500	144, 123, 102	C-160D-173-100	17,300	100, 86, 72
C-640D-305-144	30,500	144, 123, 102	C-160D-173-86	17,300	86, 74, 62
C-640D-256-144	25,600	144, 122, 101	C-160D-200-74	20,000	74, 64, 53
C-640D-305-120	30,500	120, 102, 84	C-160D-173-74	17,300	74, 62, 51
C-456D-305-168	30,500	168, 144, 121	C-160D-143-74	14,300	74, 62, 51
C-456D-305-144	30,500	144, 123, 102	C-114D-119-100	11,900	100, 86, 72
C-456D-256-144	25,600	144, 122, 101	C-114D-143-86	14,300	86, 72, 58
C-456D-365-120	36,500	120, 102, 84	C-114D-119-86	11,900	86, 72, 58
C-456D-305-120	30,500	120, 102, 84	C-114D-143-74	14,300	74, 62, 51
C-456D-256-120	25,600	120, 102, 84	C-114D-173-64	17,300	64, 55, 44
			C-114D-119-64	11,900	64, 53, 41

# API Linkage Dimensions (inches)



UNIT MODEL	A	C	P	H	I	G	R1	R2	R3	SU	Torque factor @ 90/ Stroke Length
C-1824D-305-240	222.6	120.1	212.6	324.8	120.1	112.2	61.4	53.5	46.5	-1380	111.68 / 240
C-1824D-427-216	200	120.1	189	301.2	120.1	112.2	61.4	53.5	46.5	-1080	99.78 / 216
C-1824D-365-216	200	120.1	189	301.2	120.1	112.2	61.4	53.5	46.5	-950	99.78 / 216
C-1824D-365-192	206.9	120.1	159.8	274	120.1	114.2	53.5	46.5	39.4	-689	90.10 / 192
C-1280D-305-240	222.6	120.1	212.6	324.8	120.1	112.2	61.4	53.5	46.5	-1380	111.68 / 240
C-1280D-365-192	206.9	120.1	159.8	274	120.1	114.2	53.5	46.5	39.4	-689	90.10 / 192
C-1280D-365-168	181.1	120.1	149.6	263.4	120.1	113.8	53.5	46.5	39.4	-69	78.59 / 168
C-1280D-305-168	181.1	120.1	149.6	263.4	120.1	113.8	53.5	46.5	39.4	-55	78.59 / 168
C-1280D-427-144	181.1	120.1	149.6	255.9	120.1	106.3	46.5	40	33.5	760	68.54 / 144
C-1280D-365-144	181.1	120.1	149.6	255.9	120.1	106.3	46.5	40	33.5	680	68.54 / 144
C-912D-305-240	222.6	120.1	212.6	324.8	120.1	112.2	61.4	53.5	46.5	-1433	111.68 / 240
C-912D-365-192	206.9	120.1	159.8	274	120.1	114.2	53.5	46.5	39.4	-831	90.10 / 192
C-912D-365-168	181.1	120.1	149.6	263.4	120.1	113.8	53.5	46.5	39.4	-46	78.59 / 168
C-912D-305-168	181.1	120.1	149.6	263.4	120.1	113.8	53.5	46.5	39.4	-60	78.59 / 168
C-912D-427-144	181.1	120.1	149.6	255.9	120.1	106.3	46.5	40	33.5	750	68.83 / 144
C-912D-365-144	181.1	120.1	149.6	255.9	120.1	106.3	46.5	40	33.5	685	68.83 / 144
C-640D-305-192	206.9	120.1	159.8	274	120.1	114.2	53.5	46.5	39.4	-888	90.10 / 192
C-640D-365-168	181.1	120.1	149.6	263.4	120.1	113.8	53.5	46.5	39.4	-71	78.59 / 168
C-640D-305-168	181.1	120.1	149.6	263.4	120.1	113.8	53.5	46.5	39.4	-54	78.59 / 168
C-640D-365-144	181.1	120.1	149.6	255.9	120.1	106.3	46.5	40	33.5	-677	68.54 / 144
C-640D-305-144	185.2	111	133.9	233.5	111	98.4	41.9	35.8	29.7	-402	68.54 / 144
C-640D-256-144	185.2	111	133.9	231.5	111	96.5	41.9	35.8	29.7	-390	68.54 / 144
C-640D-305-120	154.5	111	133.9	231.5	111	96.5	41.9	35.8	29.7	65	57.18 / 120
C-456D-256-192	206.9	120.1	159.8	274	120.1	114.2	53.5	46.5	39.4	-876	90.10 / 192
C-456D-305-168	181.1	120.1	149.6	263.4	120.1	113.8	53.5	46.5	39.4	-277	78.59 / 168
C-456D-305-144	185.2	111	133.9	233.5	111	98.4	41.9	35.8	29.7	-218	68.54 / 144
C-456D-256-144	185.2	111	133.9	233.5	111	98.4	41.9	35.8	29.7	-628	68.54 / 144
C-456D-365-120	154.53	111	133.9	233.5	111	98.4	41.9	35.8	29.7	383	57.18 / 120
C-456D-305-120	154.53	111	133.9	233.5	111	98.4	41.9	35.8	29.7	103	57.18 / 120
C-456D-256-120	154.53	111	133.9	231.5	111	96.5	41.9	35.8	29.7	140	57.18 / 120
C-456D-213-120	154.53	111	133.9	231.5	111	96.5	41.9	35.8	29.7	45	57.18 / 120
C-456D-256-100	129.1	111	133.9	231.5	111	96.5	41.9	35.8	29.7	882	47.91 / 100
C-320D-256-144	185.2	111	133.9	233.5	111	98.4	41.9	35.8	29.7	-336	68.54 / 144
C-320D-213-144	185.2	111	133.9	231.5	111	96.5	41.9	35.8	29.7	-410	68.54 / 144
C-320D-256-120	154.5	111	133.9	231.5	111	96.5	41.9	35.8	29.7	70	57.18 / 120
C-320D-213-120	154.5	111	133.9	231.5	111	96.5	41.9	35.8	29.7	35	57.18 / 120
C-320D-305-100	129.1	111	133.9	231.5	111	96.5	41.9	35.8	29.7	882	47.91 / 100
C-320D-256-100	129.1	111	133.9	231.5	111	96.5	41.9	35.8	29.7	882	47.91 / 100
C-320D-246-86	111	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	627	41.13 / 86
C-320D-213-86	111	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	615	41.13 / 86
C-320D-246-74	96.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	850	35.59 / 74
C-228D-185-144	185.2	111	133.9	231.5	111	96.5	41.9	35.8	29.7	-580	68.54 / 144
C-228D-213-120	154.5	111	133.9	231.5	111	96.5	41.9	35.8	29.7	35	57.18 / 120
C-228D-213-100	129.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	83	47.91 / 100
C-228D-173-100	129.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	96	47.91 / 100
C-228D-246-86	111	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	604	41.13 / 86
C-228D-213-86	111	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	617	41.13 / 86
C-228D-200-74	96.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	870	35.59 / 74
C-228D-173-74	96.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	850	35.59 / 74
C-160D-173-100	129.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	300	47.91 / 100
C-160D-173-86	111	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	615	41.13 / 86
C-160D-200-74	96.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	1030	35.59 / 74
C-160D-173-74	96.1	84	96.5	165.7	84	69.2	31.7	26.8	21.9	830	35.52 / 74
C-160D-143-74	96.1	84	96.5	165.7	84	69.2	31.7	26.8	21.9	668	35.52 / 74
C-114D-119-100	129.1	96.1	116.1	194.9	96.1	78.8	36.2	31.3	26.4	77	47.91 / 100
C-114D-143-86	111	84	96.5	165.7	84	69.2	31.7	26.8	21.9	305	41.13 / 86
C-114D-119-86	111	84	96.5	165.7	84	69.2	31.7	26.8	21.9	305	41.13 / 86
C-114D-143-74	96.1	84	96.5	165.7	84	69.2	31.7	26.8	21.9	660	35.52 / 74
C-114D-173-64	84	84	96.5	165.7	84	69.2	31.7	26.8	21.9	440	31.08 / 64
C-114D-119-64	84	64	74.8	128	64	53.2	24	19.7	15.4	36	31.08 / 64
C-80D-133-48	63.97	63.97	72.8	125.9	63.97	53.2	24	19.7	15.4	354	23.55 / 48



## General Dimensions (inches)

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	R	II	S	T	SS	TT
C-1824D-305-240	10'-0"	18'-6 1/8"	25'-2 1/8"	37'-3 1/8"	22"	13'-11 1/2"	20'-4 1/2"	31'-10 1/2"	10'-0"	58 7/8"	51 1/8"	82 1/2"	111 1/2"	20"	54"	110"	48"	62"	48"	26 1/4"	50 1/2"
C-1824D-427-216	10'-0"	16'-8"	23'-3"	34'-4 1/8"	22"	12'-7 1/8"	20'-4 1/2"	31'-10 1/2"	10'-0"	58 7/8"	51 1/8"	82 1/2"	111 1/2"	20"	50"	110"	48"	62"	48"	26 1/4"	50 1/2"
C-1824D-365-216	10'-0"	16'-8"	23'-3"	34'-4 1/8"	22"	12'-7 1/8"	20'-4 1/2"	31'-10 1/2"	10'-0"	58 7/8"	51 1/8"	82 1/2"	111 1/2"	20"	50"	110"	48"	62"	48"	26 1/4"	50 1/2"
C-1824D-365-192	10'-0"	17'-3"	21'-0"	31'-3 1/2"	22"	13'-1 1/2"	19'-10 1/2"	31'-4 1/8"	8'-2 1/2"	58 7/8"	51 1/8"	76"	111 1/2"	20"	52"	110"	48"	62"	48"	26 1/4"	50 1/2"
C-1280D-305-240	10'-0"	18'-6 1/8"	25'-2 1/8"	37'-3 1/8"	22"	13'-11 1/2"	20'-4 1/2"	31'-10 1/2"	10'-0"	52 1/2"	51 1/8"	82 1/2"	111 1/2"	20"	54"	110"	48"	62"	48"	26 1/4"	50 1/2"
C-1280D-365-192	10'-0"	17'-3"	21'-0"	31'-3"	22"	13'-1 1/2"	20'-4 1/2"	29'-5"	98 3/8"	52 1/2"	51 1/8"	76"	111 3/8"	20"	50"	110"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-1280D-365-168	10'-0"	15'-1"	20'-5 1/8"	29'-5 1/2"	17 1/2"	11'-5 1/8"	20'-4 1/2"	29'-5"	98"	52 1/2"	51 1/8"	72"	111 3/8"	20"	81"	110"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-1280D-305-168	10'-0"	15'-1"	20'-5 1/8"	29'-5 1/2"	17 1/2"	11'-1"	20'-4"	29'-4 1/2"	98"	52 1/2"	51 1/8"	72"	111 3/8"	20"	81"	110"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-1280D-427-144	10'-0"	15'-1"	19'-10 1/8"	27'-12"	17 1/2"	11'-5 1/8"	20'-1 1/2"	29'-5"	90 1/2"	52 1/2"	51 1/8"	72"	111 3/8"	20"	73"	102 1/2"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-1280D-365-144	10'-0"	15'-1"	19'-10 1/8"	27'-12"	17 1/2"	11'-5 1/8"	20'-4"	29'-4 1/2"	90 1/2"	52 1/2"	51 1/8"	72"	111 3/8"	20"	73"	102 1/2"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-912D-305-240	10'-0"	18'-6 1/8"	25'-2 1/8"	37'-3 1/8"	22"	13'-11 1/2"	20'-4 1/2"	31'-10 1/2"	10'-0"	48 1/2"	51 1/8"	82 1/2"	111 1/2"	20"	54"	110"	48"	62"	48"	26 1/4"	50 1/2"
C-912D-365-192	10'-0"	17'-3"	21'-0"	31'-3"	22"	13'-1 1/2"	20'-1 1/2"	29'-1 1/2"	98 3/8"	48 1/2"	51 1/8"	76"	109 7/8"	20"	50"	110"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-912D-365-168	10'-0"	15'-1"	20'-5 1/8"	29'-5 1/2"	17 1/2"	11'-5 1/8"	20'-4 1/2"	29'-1 1/2"	98"	48 1/2"	51 1/8"	72"	109 7/8"	20"	81"	110"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-912D-305-168	10'-0"	15'-1"	20'-5 1/8"	29'-5 1/2"	17 1/2"	11'-1"	20'-1 1/2"	29'-1"	98"	48 1/2"	51 1/8"	72"	109 7/8"	20"	81"	110"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-912D-427-144	10'-0"	15'-1"	19'-10 1/8"	27'-12"	17 1/2"	11'-5 1/8"	20'-1 1/2"	29'-1"	90 1/2"	48 1/2"	51 1/8"	72"	109 7/8"	20"	73"	102 1/2"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-912D-365-144	10'-0"	15'-1"	19'-10 1/8"	27'-12"	17 1/2"	11'-5 1/8"	20'-1 1/2"	29'-1"	90 1/2"	48 1/2"	51 1/8"	72"	109 7/8"	20"	73"	102 1/2"	47 5/8"	62"	48"	26 1/4"	50 1/2"
C-640D-305-192	10'-0"	17'-3"	21'-4 1/2"	31'-3"	17 1/2"	13'-2 1/2"	19'-5 1/2"	28'-6 1/4"	98 1/												



# Conventional Pumping Unit Counterbalance Data

All Values Shown in Lbs. of Effective Counterbalance (ECB) at Polish Rod w/ Four Weights At Maximum Position on Crank, at Longest Stroke Length

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	R	II	S	T	SS	TT
C-456D-256-192	10'-0"	17'-3"	21'-4 1/2"	31'-3"	17 1/2"	13'-2 1/2"	19'-2"	27'-4"	98 1/2"	38 3/8"	47 1/4"	76"	103 7/8"	20"	50"	110"	52"	62"	48"	26 3/4"	50 1/2"
C-456D-305-168	10'-0"	15'-1"	20'-5 1/2"	29'-5 1/2"	17 1/2"	11'-1"	19'-2"	27'-4"	98"	38 3/8"	47 1/4"	72"	103 7/8"	20"	81"	110"	52"	62"	48"	26 3/4"	50 1/2"
C-456D-305-144	10'-0"	15'-1"	19'-10 1/2"	27'-12"	17 1/2"	11'-10 1/2"	19'-2"	27'-4"	98"	38 3/8"	47 1/4"	72"	102"	20"	73"	102 7/8"	52"	62"	48"	26 3/4"	50 1/2"
C-456D-256-144	9'-3"	15'-5 1/2"	17'-11 1/2"	25'-8 1/2"	15 1/2"	11'-10 1/2"	18'-5"	26'-1"	82 1/2"	38 3/8"	43 3/8"	69 1/2"	98"	20"	51"	94 1/2"	53"	62"	48"	26 3/4"	37 1/4"
C-456D-365-120	9'-3"	12'-10 1/2"	17'-11 1/2"	25'-0"	15 1/2"	9'-3 3/4"	18'-5"	26'-1"	82 1/2"	38 3/8"	43 3/8"	69 1/2"	102"	20"	79"	94 1/2"	53"	62"	48"	26 3/4"	37 1/4"
C-456D-305-120	9'-3"	12'-10 1/2"	17'-11 1/2"	25'-0"	15 1/2"	9'-3 3/4"	18'-5"	26'-1"	82 1/2"	38 3/8"	43 3/8"	69 1/2"	98"	20"	79"	94 1/2"	53"	62"	48"	26 3/4"	37 1/4"
C-456D-256-120	9'-3"	12'-10 1/2"	17'-11 1/2"	25'-0"	15 1/2"	9'-3 3/4"	18'-5"	26'-1"	82 1/2"	38 3/8"	43 3/8"	69 1/2"	98"	20"	79"	94 1/2"	53"	62"	48"	26 3/4"	37 1/4"
C-456D-213-120	9'-3"	12'-10 1/2"	17'-11 1/2"	25'-0"	15 1/2"	9'-3 3/4"	18'-5"	26'-1"	82 1/2"	38 3/8"	43 3/8"	69 1/2"	98"	20"	79"	94 1/2"	53"	62"	48"	26 3/4"	37 1/4"
C-456D-256-100	9'-3"	10'-9 1/2"	17'-11 1/2"	24'-0"	15 1/2"	7'-2 1/2"	18'-5"	26'-1"	82 1/2"	38 3/8"	43 3/8"	69 1/2"	98"	20"	94"	94 1/2"	53"	62"	48"	27 1/2"	34 1/4"
C-320D-256-144	9'-3"	15'-5 1/2"	17'-11 1/2"	25'-8 1/2"	15 1/2"	11'-10 1/2"	18'-2 1/2"	25'-11"	82 1/2"	37 1/8"	43 3/8"	69 1/2"	92 1/2"	20"	51"	94 1/2"	53"	62"	48"	30 1/4"	34 1/4"
C-320D-213-144	9'-3"	15'-5 1/2"	17'-11 1/2"	25'-8 1/2"	15 1/2"	11'-10 1/2"	18'-2 1/2"	25'-11"	82 1/2"	37 1/8"	43 3/8"	69 1/2"	92 1/2"	20"	51"	94 1/2"	53"	62"	48"	30 1/4"	34 1/4"
C-320D-256-120	9'-3"	12'-10 1/2"	17'-11 1/2"	25'-0"	15 1/2"	9'-3 3/4"	18'-2 1/2"	25'-11"	82 1/2"	37 1/8"	43 3/8"	69 1/2"	92 1/2"	20"	79"	94 1/2"	53"	52"	48"	30 1/4"	34 1/4"
C-320D-213-120	9'-3"	12'-10 1/2"	17'-11 1/2"	25'-0"	15 1/2"	9'-3 3/4"	18'-2 1/2"	25'-11"	82 1/2"	37 1/8"	43 3/8"	69 1/2"	92 1/2"	20"	79"	94 1/2"	53"	52"	48"	30 1/4"	34 1/4"
C-320D-305-100	9'-3"	10'-9 1/2"	17'-11 1/2"	24'-0"	15 1/2"	7'-2 1/2"	18'-2 1/2"	25'-11"	82 1/2"	37 1/8"	43 3/8"	69 1/2"	92 1/2"	20"	94"	94 1/2"	53"	52"	48"	30 1/4"	34 1/4"
C-320D-256-100	9'-3"	10'-9 1/2"	17'-11 1/2"	24'-0"	15 1/2"	7'-2 1/2"	18'-2 1/2"	25'-11"	82 1/2"	37 1/8"	43 3/8"	69 1/2"	92 1/2"	20"	94"	94 1/2"	53"	52"	48"	30 1/4"	34 1/4"
C-320D-246-86	8'-0"	9'-3"	15'-3 1/2"	20'-6"	14 1/8"	5'-11 1/2"	16'-3"	23'-11 1/2"	65 3/8"	37 1/8"	36 1/4"	56 1/2"	90 1/2"	20"	72"	76 3/8"	36"	50"	45 1/4"	30 1/4"	34 1/4"
C-320D-213-86	8'-0"	9'-3"	15'-3 1/2"	20'-6"	14 1/8"	5'-11 1/2"	16'-3"	23'-11 1/2"	65 3/8"	37 1/8"	36 1/4"	56 1/2"	90 1/2"	20"	72"	76 3/8"	36"	50"	45 1/4"	30 1/4"	34 1/4"
C-320D-246-74	8'-0"	8'-0"	15'-3 1/2"	20'-3 1/2"	14 1/8"	4'-8 1/2"	16'-3"	23'-11 1/2"	65 3/8"	37 1/8"	36 1/4"	56 1/2"	90 1/2"	20"	83"	76 3/8"	36"	50"	45 1/4"	30 1/4"	34 1/4"
C-228D-185-144	9'-3"	15'-5 1/2"	17'-11 1/2"	25'-8 1/2"	15 1/2"	11'-10 1/2"	17'-11"	25'-7 1/2"	82 1/2"	33 1/2"	36 1/4"	69 1/2"	84 1/8"	20"	51"	94 1/2"	53"	50"	45 1/4"	27 1/2"	34 1/4"
C-228D-213-120	9'-3"	12'-10 1/2"	17'-11 1/2"	25'-0"	15 1/2"	9'-3 3/4"	15'-11"	25'-7 1/2"	82 1/2"	33 1/2"	36 1/4"	69 1/2"	84 1/8"	20"	79"	94 1/2"	53"	50"	45 1/4"	27 1/2"	34 1/4"
C-228D-213-100	8'-0"	10'-9 1/2"	15'-3 1/2"	21'-1"	14 1/8"	7'-5 1/2"	15'-11"	23'-7 1/2"	65 3/8"	33 1/2"	36 1/4"	56 1/2"	83 1/2"	20"	58"	76 3/8"	36"	50"	45 1/4"	27 1/2"	34 1/4"
C-228D-173-100	8'-0"	10'-9 1/2"	15'-3 1/2"	21'-1"	14 1/8"	7'-5 1/2"	15'-11"	23'-7 1/2"	65 3/8"	33 1/2"	36 1/4"	56 1/2"	83 1/2"	20"	58"	76 3/8"	36"	50"	45 1/4"	27 1/2"	34 1/4"
C-228D-246-86	8'-0"	9'-3"	15'-3 1/2"	20'-6"	14 1/8"	5'-11 1/2"	15'-11"	23'-7 1/2"	65 3/8"	33 1/2"	36 1/4"	56 1/2"	83 1/2"	20"	72"	76 3/8"	36"	50"	45 1/4"	27 1/2"	34 1/4"
C-228D-213-86	8'-0"	9'-3"	15'-3 1/2"	20'-6"	14 1/8"	5'-11 1/2"	15'-11"	23'-7 1/2"	65 3/8"	33 1/2"	36 1/4"	56 1/2"	83 1/2"	20"	72"	76 3/8"	36"	50"	45 1/4"	27 1/2"	34 1/4"
C-228D-200-74	8'-0"	8'-0"	15'-3 1/2"	20'-3 1/2"	14 1/8"	4'-8 1/2"	15'-11"	23'-7 1/2"	65 3/8"	33 1/2"	36 1/4"	56 1/2"	83 1/2"	20"	83"	76 3/8"	36"	50"	45 1/4"	27 1/2"	34 1/4"
C-228D-173-74	8'-0"	8'-0"	15'-3 1/2"	20'-3 1/2"	14 1/8"	4'-8 1/2"	15'-11"	23'-7 1/2"	65 3/8"	33 1/2"	36 1/4"	56 1/2"	83 1/2"	20"	83"	76 3/8"	36"	50"	45 1/4"	27 1/2"	34 1/4"
C-160D-173-100	8'-0"	10'-9 1/2"	15'-3 1/2"	21'-1"	14 1/8"	7'-6"	15'-7"	22'-1 1/2"	65 3/8"	29 1/2"	33 1/2"	56 1/2"	80 1/8"	20"	58"	76 3/8"	38"	45"	43"	26 3/4"	34 1/4"
C-160D-173-86	8'-0"	9'-3"	15'-3 1/2"	20'-6"	14 1/8"	5'-11 1/2"	15'-7"	22'-1 1/2"	65 3/8"	29 1/2"	33 1/2"	56 1/2"	80 1/8"	20"	72"	76 3/8"	38"	45"	43"	26 3/4"	34 1/4"
C-160D-200-74	8'-0"	8'-0"	15'-3 1/2"	20'-6"	14 1/8"	4'-8 1/2"	15'-7"	22'-1 1/2"	65 3/8"	29 1/2"	33 1/2"	56 1/2"	80 1/8"	20"	83"	76 3/8"	38"	45"	43"	26 3/4"	34 1/4"
C-160D-173-74	7'-0"	8'-0"	12'-10"	17'-7 1/2"	11 1/8"	5'-2 1/2"	14'-1"	20'-7 1/2"	58"	29 1/2"	33 1/2"	51 1/2"	78 1/8"	20"	54"	67"	29"	45"	43"	26 3/4"	34 1/4"
C-160D-143-74	7'-0"	8'-0"	12'-10"	17'-7 1/2"	11 1/8"	5'-2 1/2"	14'-1"	20'-7 1/2"	58"	29 1/2"	33 1/2"	51 1/2"	78 1/8"	20"	54"	67"	29"	45"	43"	26 3/4"	34 1/4"
C-114D-119-100	8'-0"	10'-9 1/2"	15'-3 1/2"	21'-1"	14 1/8"	7'-6"	15'-2 1/2"	21'-9"	65 3/8"	25 3/8"	33 1/2"	56 3/4"	73"	20"	58"	76 3/8"	38"	45"	43"	26 3/4"	34 1/4"
C-114D-143-86	7'-0"	9'-3"	12'-10"	18'-1"	11 1/8"	6'-5 1/2"	13'-9 1/2"	20'-4 1/2"	58"	25 3/8"	33 1/2"	51 1/2"	73"	13"	50"	67"	29"	45"	43"	23"	34 1/4"
C-114D-119-86	7'-0"	9'-3"	12'-10"	18'-1"	11 1/8"	6'-5 1/2"	13'-9 1/2"	20'-4 1/2"	58"	25 3/8"	33 1/2"	51 1/2"	73"	13"	50"	67"	29"	45"	43"	23"	34 1/4"
C-114D-143-74	7'-0"	8'-0"	12'-10"	17'-7 1/2"	11 1/8"	5'-2 1/2"	13'-9 1/2"	20'-4 1/2"	58"	25 3/8"	33 1/2"	51 1/2"	73"	20"	54"	67"	29"	45"	43"	23"	34 1/4"
C-114D-173-64	7'-0"	7'-0"	12'-10"	17'-2 1/2"	11 1/8"	4'-2 1/2"	13'-9 1/2"	20'-4 1/2"	58"	25 3/8"	33 1/2"	51 1/2"	73"	20"	63"	67"	29"	45"	43"	23"	34 1/4"
C-114D-119-64	5'-4"	7'-0"	9'-8 1/2"	14'-7 1/2"	11 1/8"	5'-3 1/2"	10'-4 1/2"	15'-4"	44"	25 3/8"	33 1/2"	39"	71 3/8"	11 1/8"	35 1/4"	51 1/8"	20"	30"	25"	16"	19 1/2"
C-80D-133-48	5'-4"	5'-4"	9'-6"	13'-3"	9 1/2"	3'-4 1/2"	9'-6 1/2"	14'-1"	42 1/2"	22 1/8"	25 1/2"	37 1/2"	64"	9"	52"	52"	20"	30"	25"	16"	19"

Note: Do not use the above dimensions for foundation. Request a foundation plan. Dimensions subject to change without notice. Popular API models shown, other models available on request.

Unit Model	Crank Name	Crank-Only ECB	ECB for LS Counterweight Sizes								
			No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
C-1280D-365-192	4354	3,967	22,559	19,029	17,257	16,014	14,188	12,337	10,455	8,464	7,116
C-1280D-365-168	4354	5,559	26,822	22,784	20,757	19,336	17,248	15,131	12,979	10,701	9,160
C-1280D-305-168	4354	5,573	26,886	22,839	20,808	19,383	17,290	15,168	13,011	10,728	9,183
C-1280D-427-144	4045	5,784	-	23,608	21,569	20,093	17,925	15,751	13,535	11,175	9,568
C-1280D-365-144	4045	5,784	-	23,608	21,569	20,093	17,925	15,751	13,535	11,175	9,568
C-912D-365-192	640.21.30.01A-2	4,510	22,915	19,389	17,619	16,377	14,554	12,705	10,826	9,513	8,131
C-912D-365-168	Y456.02.30.02A	5,942	27,179	23,146	21,122	19,702	17,617	15,503	13,353	11,078	10,024
C-912D-305-168	4354	5,942	27,179	23,146	21,122	19,702	17,617	15,503	13,353	11,078	9,539
C-912D-427-144	4045	5,784	-	23,608	21,569	20,093	17,925	15,751	13,535	11,175	9,568
C-912D-365-144	4045	5,784	-	23,608	21,569	20,093	17,925	15,751	13,535	11,175	9,568
C-640D-365-168	Y456.02.30.02A	5,898	27,211	23,164	21,133	19,708	17,615	15,493	13,336	11,053	9,705
C-640D-305-168	4354	5,788	27,101	23,054	21,023	19,598	17,505	15,383	13,226	10,943	9,398
C-640D-365-144	4045	5,784	-	23,608	21,569	20,093	17,925	15,751	13,535	11,175	9,568
C-640D-305-144	640.24.30.01A	5,518	-	19,900							

# Enhanced Geometry RM Pumping Units

## Phased Counterbalance

Lone Star's API Rear Mounted (RM) pumping units offer certain benefits not typically found in conventional pumping units. Through its unique design geometry, the RM unit exhibits higher efficiency and allows more crank rotation during the upstroke portion of the pumping cycle, resulting in less energy used and more complete pump fillage. The torque advantage of RM units is best observed in wells deeper than 8,000 feet.



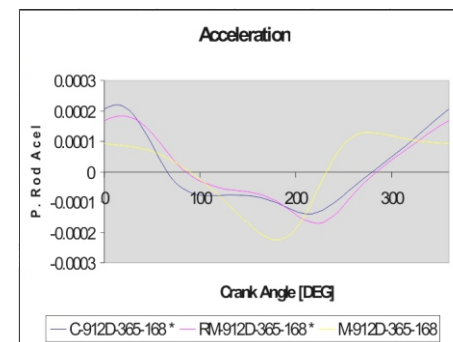
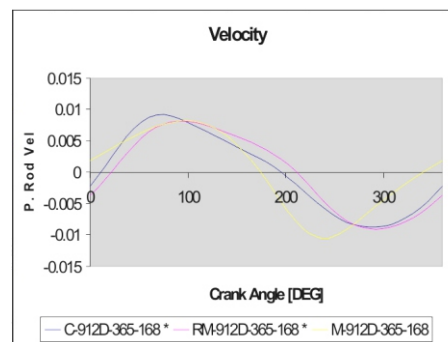
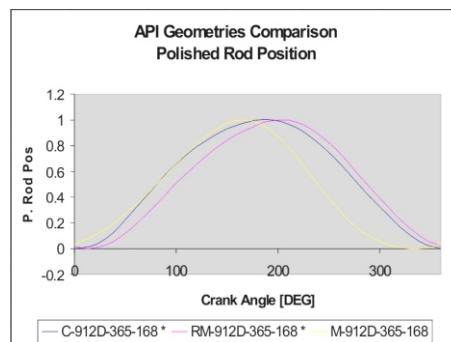
## Tangible Benefits Over Conventional & Front Mounted Unit

Compared to Conventional Class I geometries ( C units), the RM's upstroke dedicates a greater portion of its 360° rotation to the upstroke ( as seen on Displacement and Velocity graphs below ) enabling slower velocities for better pump fillage.

Compared to Class III geometries ( MK II units) , the RM's downstroke has lower down stroke acceleration of the sucker rod string, therefore reducing rod compression and so extending the fatigue life of the pumping system.

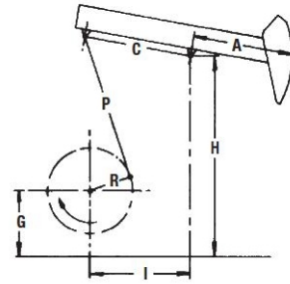
## Specifications

Unit Designation	Polished Rod Capacity, Lbs.	Stroke Length in Inches	Unit Designation	Polished Rod Capacity, Lbs.	Stroke Length in Inches
RM-1280D-365-192	36,500	192, 165, 138	RM-320D-256-120	25,600	120, 102, 84
RM-1280D-365-168	36,500	168, 144, 121	RM-320D-213-120	21,300	120, 102, 84
RM-1280D-305-168	30,500	168, 144, 121	RM-320D-305-100	30,500	100, 85, 70
RM-1280D-427-144	42,700	144, 123, 102	RM-320D-256-100	25,600	100, 85, 70
RM-1280D-365-144	36,500	144, 123, 102	RM-320D-246-86	24,600	86, 74, 62
RM-912D-365-192	36,500	192, 165, 138	RM-320D-213-86	21,300	86, 74, 62
RM-912D-365-168	36,500	168, 144, 121	RM-320D-246-74	24,600	74, 64, 53
RM-912D-305-168	30,500	168, 144, 121	RM-228D-185-144	18,500	144, 122, 101
RM-912D-427-144	42,700	144, 123, 102	RM-228D-213-120	21,300	120, 102, 84
RM-912D-365-144	36,500	144, 123, 102	RM-228D-213-100	21,300	100, 86, 72
RM-640D-365-168	36,500	168, 144, 121	RM-228D-173-100	17,300	100, 86, 72
RM-640D-305-168	30,500	168, 144, 121	RM-228D-246-86	24,600	86, 74, 62
RM-640D-365-144	36,500	144, 123, 102	RM-228D-213-86	21,300	86, 74, 62
RM-640D-305-144	30,500	144, 123, 102	RM-228D-200-74	20,000	74, 64, 53
RM-640D-256-144	25,600	144, 122, 101	RM-228D-173-74	17,300	74, 64, 53
RM-640D-305-120	30,500	120, 102, 84			
RM-456D-305-168	30,500	168, 144, 121			
RM-456D-305-144	30,500	144, 123, 102			
RM-456D-256-144	25,600	144, 122, 101			
RM-456D-365-120	36,500	120, 102, 84			
RM-456D-305-120	30,500	120, 102, 84			
RM-456D-256-120	25,600	120, 102, 84			
RM-456D-213-120	21,300	120, 102, 84			
RM-456D-256-100	25,600	100, 85, 70			
RM-320D-256-144	25,600	144, 122, 101			

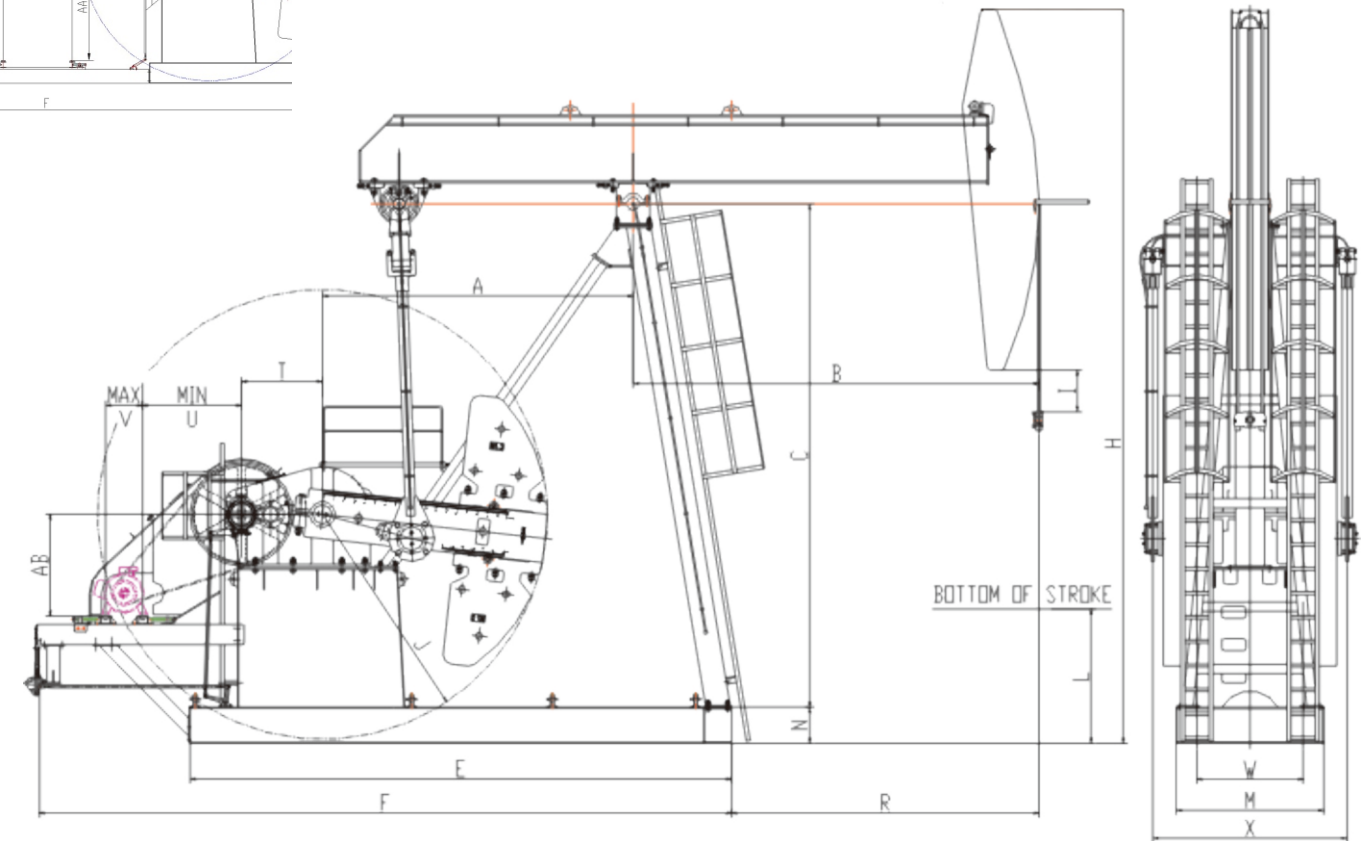
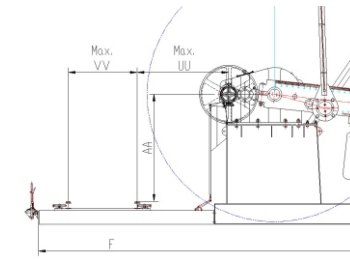




# API Linkage Dimensions (inches)



UNIT MODEL	A	C	I	P	H	G	R1	R2	R3	S.U.	PHASE ANGLE	T.F.@90°-Phase Angle /Stroke Length
RM-1280D-427-192	231.9	118.1	161.4	171.3	273.2	111.8	45.1	38.0	30.9	-1450	-9	88.86/192
RM-1280D-365-192	231.9	118.1	161.4	171.3	273.2	111.8	45.1	38.0	30.9	-1380	-9	88.86/192
RM-1280D-427-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-435	-9	78.78/168
RM-1280D-365-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-360	-9	78.78/168
RM-912D-427-192	231.9	118.1	161.4	171.3	273.2	111.8	45.1	38.0	30.9	-1450	-9	88.86/192
RM-912D-365-192	231.9	118.1	161.4	171.3	273.2	111.8	45.1	38.0	30.9	-1380	-9	88.86/192
RM-912D-305-192	231.9	118.1	161.4	171.3	273.2	111.8	45.1	38.0	30.9	-1320	-9	88.86/192
RM-912D-427-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-435	-9	78.78/168
RM-912D-365-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-360	-9	78.78/168
RM-912D-305-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-455	-9	78.78/168
RM-912D-427-144	169.5	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	75	-9	67.40/144
RM-912D-365-144	169.5	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	85	-9	67.40/144
RM-912D-305-144	169.5	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	350	-9	67.40/144
RM-640D-305-192	231.9	118.1	161.4	171.3	273.2	111.8	45.1	38.0	30.9	-320	-9	88.86/192
RM-640D-365-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-360	-9	78.78/168
RM-640D-305-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-450	-9	78.78/168
RM-640D-427-144	169.5	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	75	-9	67.40/144
RM-640D-365-144	169.5	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	85	-9	67.40/144
RM-640D-305-144	173.2	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	350	-12	66.97/144
RM-640D-256-144	173.2	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	-150	-12	66.97/144
RM-640D-305-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	200	-12	55.87/120
RM-640D-256-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	126	-12	55.87/120
RM-456D-305-168	198.0	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-455	-9	78.78/168
RM-456D-365-144	169.5	114.2	151.6	161.4	263.4	111.8	45.1	38.0	30.9	-85	-9	67.40/144
RM-456D-305-144	173.2	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	-245	-12	66.97/144
RM-456D-256-144	173.2	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	-230	-12	66.97/144
RM-456D-365-120	144.5	102.4	135.0	141.7	248.8	113.8	39.4	32.9	26.4	220	-12	55.87/120
RM-456D-305-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	200	-12	55.87/120
RM-456D-256-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	120	-12	55.87/120
RM-320D-256-144	173.2	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	-230	-12	66.97/144
RM-320D-305-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	200	-12	55.87/120
RM-320D-256-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	120	-12	55.87/120
RM-320D-213-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	115	-12	55.87/120
RM-320D-305-100	120.3	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	450	-12	46.50/100
RM-320D-256-100	120.3	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	220	-12	46.50/100
RM-320D-246-86	101.2	89.8	116.1	122.0	194.9	78.7	35.4	29.7	24.0	550	-14	40.20/86
RM-228D-213-120	144.5	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	50	-12	55.87/120
RM-228D-256-100	120.3	102.4	135.0	141.7	231.5	96.5	39.4	32.9	26.4	220	-12	46.50/100
RM-228D-213-100	117.7	89.9	116.1	122.0	194.9	78.7	35.4	29.7	24.0	210	-14	46.77/100
RM-228D-173-100	117.7	89.9	116.1	122.0	194.9	78.7	35.4	29.7	24.0	210	-14	46.77/100
RM-228D-246-86	101.2	89.8	116.1	122.0	194.9	78.7	35.4	29.7	24.0	550	-14	40.20/86
RM-228D-213-86	101.2	89.8	116.1	122.0	194.9	78.7	35.4	29.7	24.0	550	-14	40.20/86
RM-228D-200-74	87.2	89.8	116.1	122.0	194.9	78.7	35.4	29.7	24.0	750	-14	34.65/74
RM-228D-173-74	87.2	89.8	116.1	122.0	194.9	78.7	35.4	29.7	24.0	750	-14	34.65/74



# General Dimensions (inches)

Unit Size	A	B	C	E	F	H	I	J	L	M	N	R	T	U	V	W	X	AA	AB	UU	VV
RM-1280D-427-192	161.4	231.9	251.2	296.0	372.0	380.0	20.5	109.8	64.5	75.98	22.0	183.5	52.6	11.5	57	55.1	100.4	91.8	45.3	81.5	53.5
RM-1280D-365-192	161.4	231.9	251.2	296.0	372.0	380.0	20.5	109.8	64.5	75.98	22.0	183.5	52.6	11.5	57	55.1	100.4	91.8	45.3	81.5	53.5
RM-1280D-427-168	151.6	198.0	241.3	286.0	362.2	358.3	20.5	109.8	64.5	75.98	22.0	149.6	52.6	11.5	57	51.2	100.4	91.8	45.3	81.5	53.5
RM-1280D-365-168	151.6	198.0	241.3	286.0	362.2	358.3	20.5	109.8	64.5	75.98	22.0	149.6	52.6	11.5	57	51.2	100.4	91.8	45.3	81.5	53.5
RM-912D-427-192	161.4	231.9	251.2	296.0	372.0	380.0	20.5	109.8	64.5	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-365-192	161.4	231.9	251.2	296.0	372.0	380.0	20.5	109.8	64.5	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-305-192	161.4	231.9	251.2	296.0	362.0	380.0	20.5	109.8	64.5	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-427-168	151.6	198.0	241.3	272.0	348.2	358.3	20.5	109.8	64.5	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-365-168	151.6	198.0	241.3	272.0	348.2	358.3	20.5	109.8	64.5	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-305-168	151.6	198.0	241.3	272.0	348.2	358.3	20.5	109.8	64.5	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-427-144	151.6	169.5	241.3	272.0	348.2	358.3	20.5	109.8	51.1	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-365-144	151.6	169.5	241.3	272.0	348.2	358.3	20.5	109.8	51.1	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5
RM-912D-305-144	151.6	169.5	241.3	272.0	348.2	358.3	20.5	109.8	51.1	75.98	22.0	149.6	48.4	11.5	57	51.2	98.8	91.8	45.3	81.5	53.5



Unit Size	A	B	C	E	F	H	I	J	L	M	N	R	T	U	V	W	X	AA	AB	UU	VV
RM-640D-305-192	161.4	231.9	251.2	296.0	372.0	380.0	20.5	109.8	64.5	72.0	22	183.5	41.3	11.5	57	51.2	94.9	91.8	49.6	81.5	53.5
RM-640D-365-168	151.6	198.0	245.7	264.8	341.0	358.3	20.5	109.8	64.5	72.0	17.7	149.8	41.3	11.5	57	51.2	94.9	91.8	49.6	81.5	53.5
RM-640D-305-168	151.6	198.0	245.7	264.8	341.0	358.3	20.5	109.8	64.5	72.0	17.7	149.8	41.3	11.5	57	51.2	94.9	91.8	49.6	81.5	53.5
RM-640D-427-144	151.6	169.5	241.3	264.8	341.0	358.3	20.5	109.8	51.1	72.0	17.7	121.3	41.3	11.5	57	51.2	94.9	80.4	28.7	81.5	53.5
RM-640D-365-144	151.6	169.5	245.7	264.8	341.0	358.3	20.5	109.8	51.1	72.0	17.7	121.3	41.3	11.5	57	51.2	94.9	80.4	28.7	81.5	53.5
RM-640D-305-144	135.0	173.2	213.8	248.2	324.4	313.0	37.2	94.5	51.1	72.0	17.7	125.0	41.3	11.5	57	51.2	94.9	80.4	28.7	81.5	53.5
RM-640D-256-144	135.0	173.2	213.8	248.2	324.4	313.0	37.2	94.5	51.1	72.0	17.7	125.0	41.3	11.5	57	51.2	94.9	80.4	28.7	81.5	53.5
RM-640D-305-120	135.0	144.5	213.8	248.2	324.4	313.0	37.2	94.5	77.6	72.0	17.7	96.3	41.3	11.5	57	51.2	94.9	82.4	28.7	81.5	53.5
RM-640D-256-120	135.0	144.5	213.8	248.2	324.4	313.0	37.2	94.5	77.6	72.0	17.7	96.3	41.3	11.5	57	51.2	94.9	82.4	28.7	81.5	53.5
RM-456D-305-168	151.6	198.0	245.7	264.8	341.0	358.3	20.5	109.8	64.5	69.3	15.7	149.8	38.4	11.5	57	51.2	90.0	91.8	49.6	81.5	53.5
RM-456D-365-144	151.6	169.5	245.7	259.4	326.4	313.0	37.2	109.8	51.1	69.3	15.7	126.7	38.4	11.5	57	51.2	90.0	80.4	28.7	81.5	53.5
RM-456D-305-144	135.0	173.2	215.7	242.8	309.8	313.0	37.2	94.5	51.1	69.3	15.7	130.4	38.4	11.5	57	51.2	90.0	80.4	28.7	81.5	53.5
RM-456D-256-144	135.0	173.2	215.7	242.8	309.8	313.0	37.2	94.5	51.1	69.3	15.7	130.4	38.4	11.5	57	51.2	90.0	80.4	28.7	81.5	53.5
RM-456D-365-120	135.0	144.5	215.7	242.8	309.8	299.6	32.5	94.5	77.6	69.3	15.7	101.7	38.4	11.5	57	51.2	90.0	82.4	28.7	81.5	53.5
RM-456D-305-120	135.0	144.5	215.7	242.8	309.8	299.6	32.5	94.5	77.6	69.3	15.7	101.7	38.4	11.5	57	51.2	90.0	82.4	28.7	81.5	53.5
RM-456D-256-120	135.0	144.5	215.7	242.8	309.8	299.6	32.5	94.5	77.6	69.3	15.7	101.7	38.4	11.5	57	51.2	90.0	82.4	28.7	81.5	53.5
RM-320D-256-144	135.0	173.2	215.7	242.8	363.5	313.0	37.2	94.5	51.1	69.3	15.7	130.4	37.4	11.5	57	51.2	84.3	80.4	28.7	81.5	53.5
RM-320D-305-120	135.0	144.5	215.7	215.7	363.5	299.6	32.5	94.5	77.6	69.3	15.7	101.7	37.4	11.5	57	51.2	84.3	82.4	28.7	81.5	53.5
RM-320D-256-120	135.0	144.5	215.7	215.7	363.5	299.6	32.5	94.5	77.6	69.3	15.7	101.7	37.4	11.5	57	51.2	84.3	82.4	28.7	81.5	53.5
RM-320D-213-120	135.0	144.5	215.7	215.7	363.5	299.6	32.5	94.5	77.6	69.3	15.7	101.7	37.4	11.5	57	51.2	84.3	82.4	28.7	81.5	53.5
RM-320D-305-100	135.0	120.3	215.7	215.7	363.5	299.6	32.5	94.5	77.6	69.3	15.7	77.5	37.4	11.5	57	51.2	84.3	82.4	28.7	81.5	53.5
RM-320D-256-100	135.0	120.3	215.7	215.7	363.5	299.6	32.5	94.5	77.6	69.3	15.7	77.5	37.4	11.5	57	51.2	84.3	82.4	28.7	81.5	53.5
RM-320D-246-86	116.1	101.2	179.2	196.8	344.6	280.7	36.0	76.4	74.0	69.3	15.7	58.4	37.4	11.5	57	51.2	84.3	82.4	28.7	81.5	53.5
RM-228D-213-120	135.0	144.5	215.7	215.7	362.0	299.6	32.5	94.5	77.6	56.7	15.7	103.2	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5
RM-228D-256-100	135.0	120.3	215.7	215.7	362.0	299.6	32.5	94.5	77.6	56.7	15.7	103.2	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5
RM-228D-213-100	116.1	117.7	179.2	196.8	343.1	280.7	36.0	76.4	77.6	56.7	15.7	76.4	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5
RM-228D-173-100	116.1	117.7	179.2	196.8	343.1	280.7	36.0	76.4	77.6	56.7	15.7	76.4	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5
RM-228D-246-86	116.1	101.2	179.2	196.8	343.1	280.7	36.0	76.4	74.0	56.7	15.7	59.9	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5
RM-228D-213-86	116.1	101.2	179.2	196.8	343.1	280.7	36.0	76.4	74.0	56.7	15.7	59.9	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5
RM-228D-200-74	116.1	87.2	179.2	196.8	343.1	280.7	36.0	76.4	74.0	56.7	15.7	45.9	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5
RM-228D-173-74	116.1	87.2	179.2	196.8	343.1	280.7	36.0	76.4	74.0	56.7	15.7	45.9	33.5	11.5	57	43.3	75.9	82.4	28.7	81.5	53.5

Do not use the above dimensions for foundation, request a foundation plan.  
Popular API modles shown, other modles available on request.

## Useful Formulas

### Strokes per Minute

Formula:  $SPM = \frac{RPM}{R} \times \frac{d}{D}$  Example:  $SPM = \frac{980}{28.79} \times \frac{12}{50} = 8.17$

Where: RPM = 980 Revolutions per minute of prime mover  
R = 28.79 (912D Gear Reducer)  
d = 12" Pitch Diameter of Prime Mover Sheave  
D = 50" Pitch Diameter of Gear Reducer Sheave

### Prime Mover Sheave Diameter

Formula:  $d = \frac{SPM \times R \times D}{RPM}$  Example:  $d = \frac{12 \times 28.79 \times 50}{980} = 17.6 \text{ inches}$

Where: SPM = 12 Strokes per Minute  
R = 28.79 Ratio (912D Gear Reducer)  
D = 50" Pitch Diameter of Gear Reducer Sheave  
RPM = 980 Revolutions per Minute of Prime Mover  
Use nearest size available depending upon belt section and number of grooves in sheave.

### Belt Velocity

Formula:  $V = \frac{\pi \times d \times RPM}{12}$  Example:  $V = \frac{3.1416 \times 17.6 \times 980}{12} = 4515 \text{ FPM}$

Where: d = 17.6 inch Pitch Diameter  
RPM = 980 Revolutions per minute of Prime Mover  
Limit between 2000 and 5000 feet per min. (FPM)  
Belt Velocity less than 2000 FPM results in poor belt life.  
Belt Velocity greater than 5000 FPM requires dynamically balanced sheaves.

### Center Distance

Formula:  $CD = \sqrt{\left(S + \frac{T}{2}\right)^2 + (I - b)^2}$  Example:  $CD = \sqrt{\left(26.25 + \frac{50.5}{2}\right)^2 + (47.125 - 11)^2} = 62.9 \text{ inches}$

Example: Assumes Hi-Prime Electric Motor Driven C-912D-305-168 Conventional Unit

$CD = \sqrt{\left(26.25 + \frac{50.5}{2}\right)^2 + (47.125 - 11)^2} = 62.9 \text{ inches}$

Where: SS = 26.25 (see General Dimensions)  
TT = 50.5 (see General Dimensions)  
II = 47.125 (see General Dimensions)  
b = 11 (assume 55 HP)

### Belt Length

Formula:  $PL = 2CD + 1.57(D + d) + \frac{(D - d)^2}{4 \times CD}$  Example:  $PL = 2 \times 62.9 + 1.57(50 + 17.6) + \frac{(50 - 17.6)^2}{4 \times 62.9} = 236.1 \text{ inches}$

Where: CD = 66.21 inch Center Distance of Shafts  
D = 47 inch Pitch Diameter of Gear Reducer Sheave  
d = 14.5 inch Pitch Diameter of Prime Mover Sheave  
Use nearest belt size available depending on type of sheaves selected.

### Horsepower of Prime Mover

For High Slip Electric Motors And Slow Speed Engines

$HP = \frac{BPD \times Depth}{56000}$

For Normal Slip Electric Motors And Multi-cylinder Engines

$HP = \frac{BPD \times Depth}{45000}$

Example: Assumes high slip (Nema D) motor.

$HP = \frac{250 \times 5000}{56000} = 22.32$  Use 55 HP Motor

Where: BPD = 250 @ 100% pump efficiency  
Depth = 5600 feet, pump setting

### Maximum Strokes per Minute (based on the free fall speed of the rod)

Conventional Units:  $SPM = .7 \sqrt{\frac{60000}{L}}$  FM Units:  $SPM = .56 \sqrt{\frac{60000}{L}}$

Example: Assumes a C-912D-305-168 Conventional Unit.

$SPM = .7 \sqrt{\frac{60000}{168}} = 13.23$  SPM Maximum

### Definition of Symbols Used

SPM = Strokes per Minute  
RPM = Revolutions per Minute of Prime Mover  
FPM = Feet per Minute  
R = Gear Reducer Ratio  
D = Gear Reducer Sheave Pitch Diameter, inches  
d = Prime Mover Sheave Pitch Diameter, inches  
v = Belt Velocity, Feet per Minute = 3.1416 (Pi)  
PL = Belt Pitch Length, inches  
CD = Shaft Center Distance, inches  
S = see General Dimensions  
T = see General Dimensions  
I = see General Dimensions  
SS = see General Dimensions  
TT = see General Dimensions  
II = see General Dimensions  
b = Prime Mover Backing (vertical distance from mounting feet to center of shaft), inches  
HP = Horsepower  
BPD = Barrels per Day at 100% Pump Efficiency  
Depth = Pump Setting, feet  
L = Stroke Length, inch