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## 1 Field of Application

Heavy-Duty slurry pumps are recommended for coarse or fine particles from solids-laden waste water to aggressive slurries of an abrasive or corrosive nature.

## 2 Pump Type Description

Vertical, end suction, modified volute casing pump includes three-vane impeller for large solids passage with good suction performance, high efficiency and good wear characteristics over a broad operating range. Interchangeable elastomer and metal designs allow best material choice for application. The single-stage, compact, low weight arrangement allows easy maintenance of wet-end components once removed from sump.

## 3 Pump Designation Code

**LCV-M80-300.3T-1OB M1**

Pump Type-----|  
Hydraulic Type-----|  
Discharge Nozzle DN in mm-----|  
Nominal Impeller Diameter in mm-----|  
Shaft Size-----|  
Seal Type-----|  
Cantilever Length-----|  
Options-----|  
Motor Mount-----|  
Material Code -----|

Hydraulic Type

M .....Metal

Mechanical (Shaft) Size (mm)

1	2	3	4	5	6
90	110	130	150	170	200

Seal Type

S ..... Seal Plate

T ..... Throttle Seal

Motor Mount

A ..... Small

B ..... Large

Options

O ..... Open Shroud

C ..... Closed Shroud

Nominal Cantilever Lengths

1	2	3	4	5
900	1200	1500	1800	2100

Nominal Flange and Impeller Diameters in mm (inches)

Designation	Discharge	Suction	Impeller
LCV 50 - 230	50 (2")	80 (3")	225 (8.86")
LCV 80 - 300	80 (3")	100 (4")	310 (12.22")
LCV 100 - 400	100 (4")	150 (6")	395 (15.55")
LCV 150 - 500	150 (6")	200 (8")	500 (19.69")
LCV 200 - 610	200 (8")	250 (10")	610 (24")
LCV 250 - 660	250 (10")	300 (12")	660 (26")
LCV 300 - 710	300 (12")	350 (14")	710 (27.95")

## 4 Technical Data

The selection and application of vertical cantilever centrifugal slurry pumps is similar to that of other water pumps, but several additional considerations

must be recognized. These considerations arise from the effects of the solid particles being conveyed. These solids have four primary effects:

1. Wear effects due to the action of the solids against the wetted surfaces of the pump.
2. Hydraulic loading effects due to the specific gravity of the slurry, which is often well above that of water and commonly varies with time in a typical slurry system.
3. Small to moderate reductions in generated head and operating efficiency caused by friction between the solids and the liquid.
4. Piping system considerations including friction losses and overall system stability.

Items 1, 2 and 3 directly affect the selection and performance of the pump and are covered in this document. Item 4 represents an area of study too broad to address here. For further information, refer to the book, "Slurry Transport Using Centrifugal Pumps," by Wilson, Addie & Clift. Another useful reference which should be read is the *LCV Maintenance Manual*, especially sections on Operational Problems and Solutions, and Trouble Shooting.

Some of the practical considerations include hydraulic design, materials of construction, limitations on operating parameters to resist wear, and the construction and operation of the shaft seal and mechanical element.

### 4.1 Classification of Slurry Duties

In selecting a slurry pump, it is prudent to adjust the allowable operating range of the pump in accordance with the severity of the slurry duty. Figure 1 contains the current GIW method in which the severity of the slurry is rated (class 1 to 4) based on slurry specific gravity, average particle diameter and abrasivity. The resulting limits on impeller speed, casing velocities and range of flow rate are given for each class.

It must be stressed that this chart, like any selection chart, is for estimating purposes and will most often result in conservative selections. Rating of slurry class and application of limits is open to interpretation, and successful slurry operation outside of the given limits is common. The important feature of the chart is that it gives the novice a solid basis for selection and the expert a reference point from which to build and apply experience.

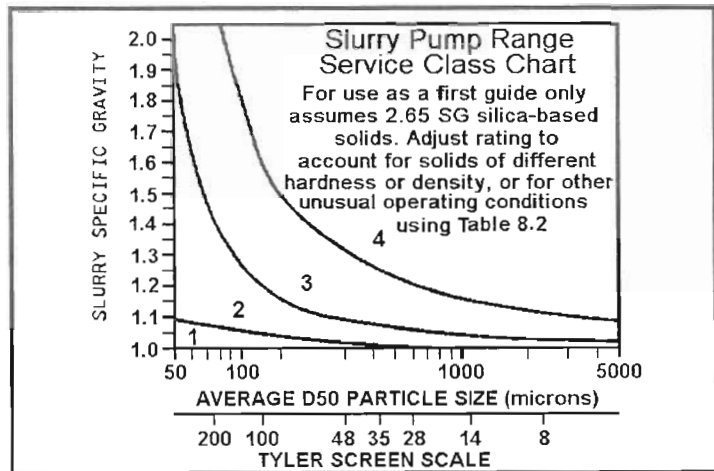
This method is automatically applied by the GIW pump and pipeline program, Slysyl.

### 4.2 Head-Flow Selection Charts

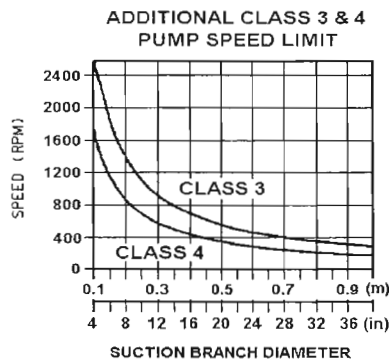
Figures 2 through 5 give head-flow based pump sizing charts for the LCV range. Each chart is based on one of the four slurry severity "classes" described in section 4.1.

In these charts the dividing line between pumps of different sizes is based on the point at which the larger pump becomes at least 2% more efficient than the smaller pump.

# PUMP RANGE SERVICE CLASS CHART AND OPERATING LIMITS



OPERATING * LIMITS	SHELL TYPE	SERVICE CLASS			
		1	2	3	4
Maximum Discharge (R) Velocity		40. (ft/s) 12.2 (m/s)	32. (ft/s) 9.8 (m/s)	27. (ft/s) 8.2 (m/s)	20. (ft/s) 6.1 (m/s)
Maximum Throat (R) Velocity		50. (ft/s) 15.2 (m/s)	40. (ft/s) 12.2 (m/s)	30. (ft/s) 9.1 (m/s)	20. (ft/s) 6.1 (m/s)
Recommended Percent Range (w) Of BEP Flow Rate	AH	20 – 120%	30 – 110%	40 – 100%	50 – 90%
	CH	30 – 130%	40 – 120%	50 – 110%	60 – 100%
	TH	50 – 140%	60 – 130%	70 – 120%	80 – 110%
	OBH	10 – 110%	20 – 100%	30 – 90%	40 – 80%
All Metal Pump Maximum Impeller (R) Pheripheral Speed		8500 (sfpm) 43.2 (m/s)	7500 (sfpm) 38.1 (m/s)	6500 (sfpm) 33.0 (m/s)	5500 (sfpm) 27.9 (m/s)
Rubber Lined Pump Maximum Impeller (R) Pheripheral Speed		5500 (sfpm) 27.9 (m/s)	5000 (sfpm) 25.4 (m/s)	4500 (sfpm) 22.9 (m/s)	4000 (sfpm) 20.3 (m/s)



SLURRY ABRASIVITY ADJUSTMENT (To apply multiply both slurry solids D50 size & specify gravity of slurry by correction factor)	
SERVICE TYPE	CORRECTION FACTOR
Normal Silica Slurries Such As Dredged River Material, Taconite, Tailings, ect.	1.0
Dredged Coral, Bottom Ash, Copper Mill Circuit Slurries & Slurries Known to be Abrasive	1.2
Coal Slurries, Slurries that are Friable & Break up & Slurries With Slimes Content	0.8

	REJECTION (R)	WARNING (W)
FLOW	< 10% BEPQ > 150% BEPQ	SEE ABOVE
TURNDOWN	> 1.02 < 0.7	> 1.004 < 0.8
IF RUN SYSTEM	N/A	NPSHA < NPSHR
SUCTION VELOCITY	N/A	< 3.0 FT / SEC (1 M/SEC)

\* Selection Rejection (R) or Warning (W) applies as noted in GIW Selection program.

Figure 1. Slurry Service Class Chart

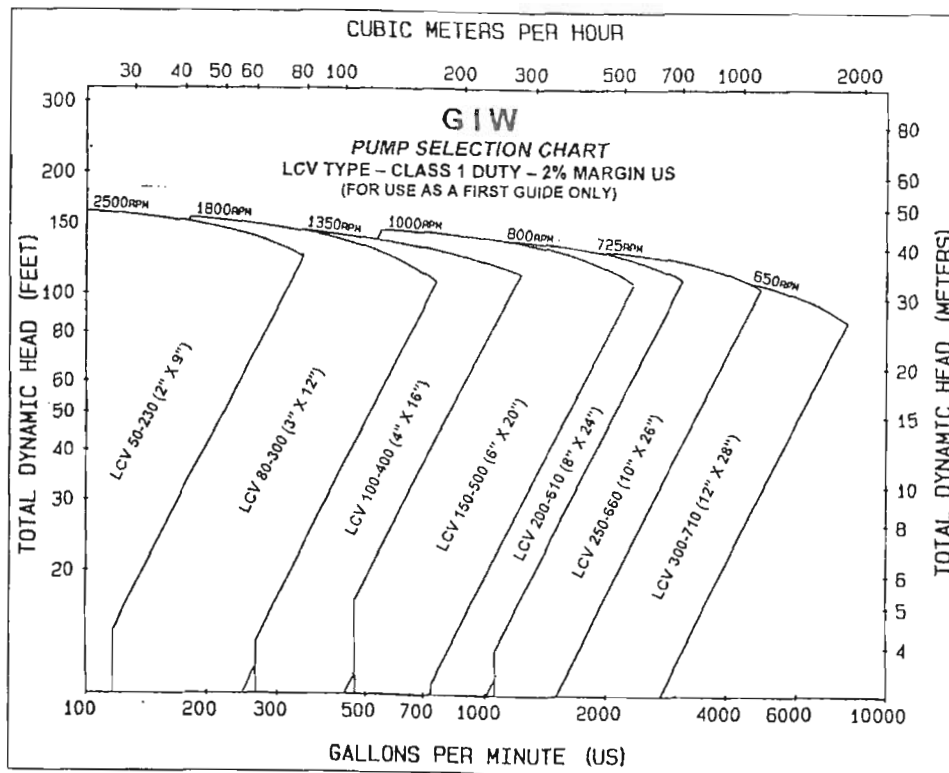


Figure 2. LCV Head-Flow Selection Chart for Class 1 Duty

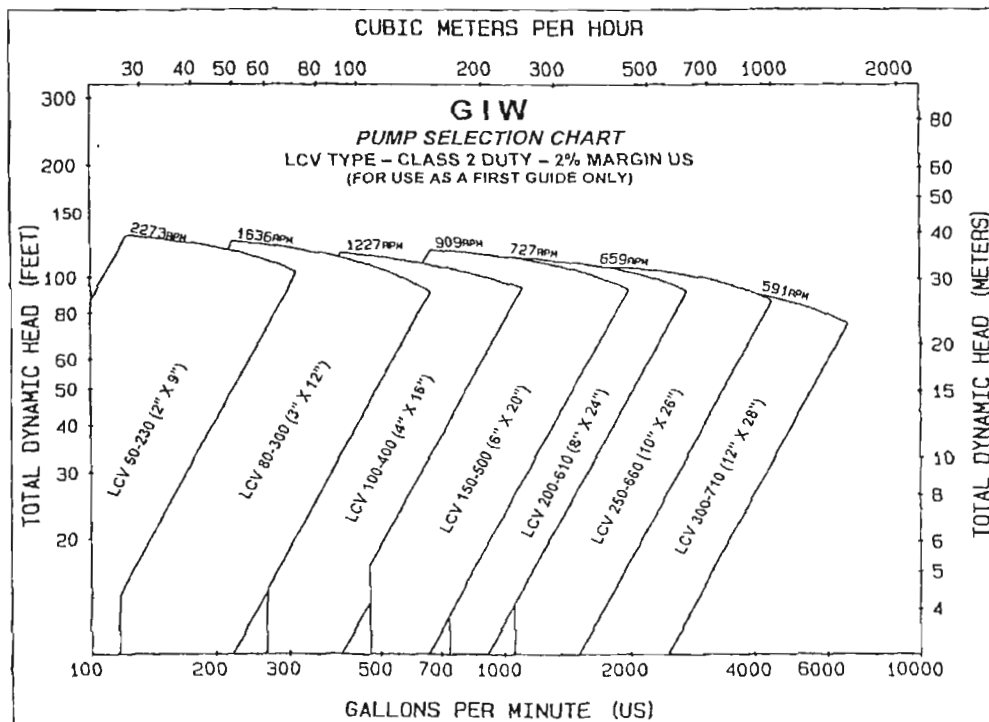


Figure 3. LCV Head-Flow Selection Chart for Class 2 Duty

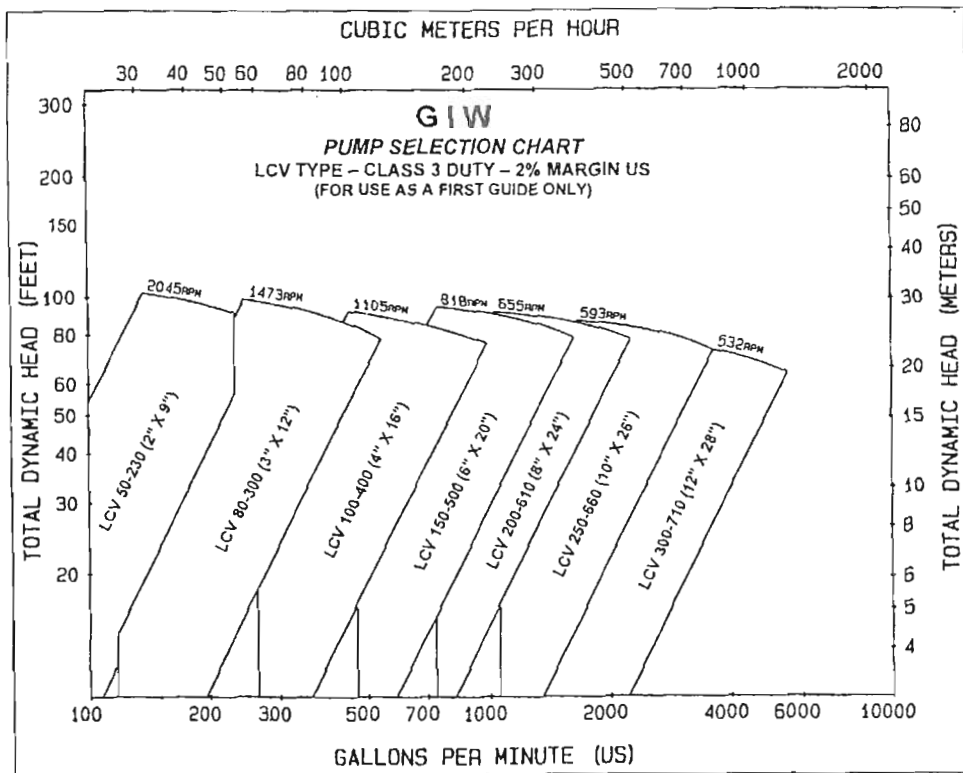


Figure 4. LCV Head-Flow Selection Chart for Class 3 Duty

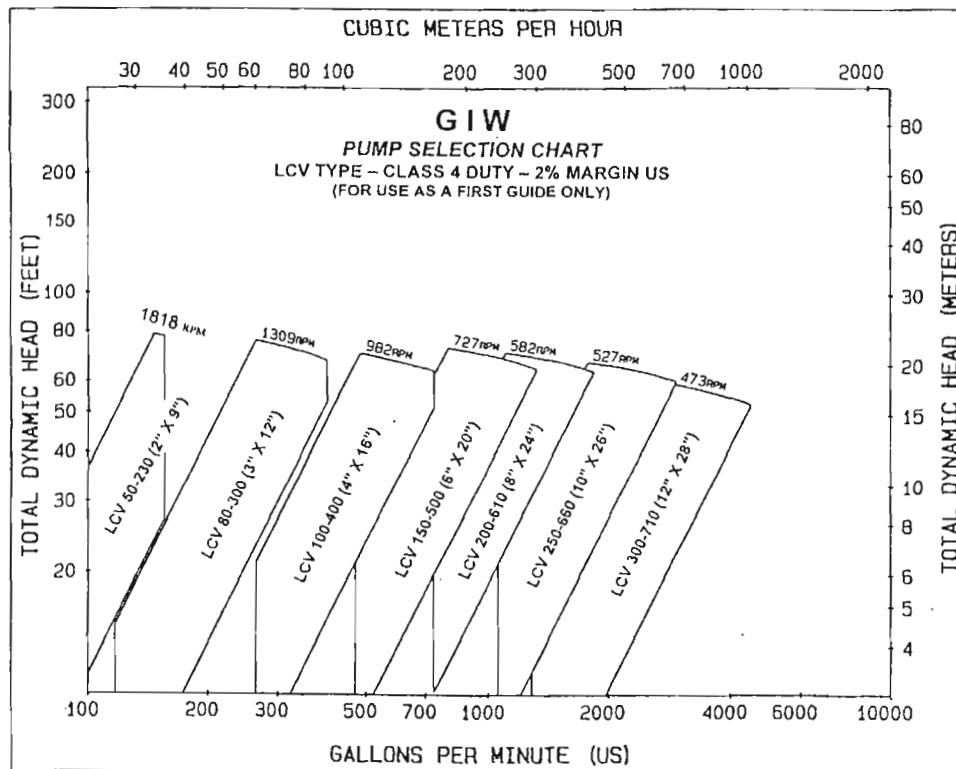


Figure 5. LCV Head-Flow Selection Chart for Class 4 Duty

### 4.3 Pressure and Temperature Limits

Figures 6 and 7 give pressure and temperature limitations for the standard LCV range of pumps. Higher pressures and temperatures may be possible through the use of special materials or methods of construction. Contact your GIW / KSB sales office for the availability of custom options.

Nominal Pump Size	Std. Metal	
	bar	psi
50 - 230 (2" x 9")	11	160
80 - 300 (3" x 12")	10.5	150
100 - 400 (4" x 16")	9.5	140
150 - 500 (6" x 20")	9	130
200 - 610 (8" x 24")	8.5	120
250 - 660 (10" x 26")	7.5	110
300 - 710 (12" x 28")	7	100

Figure 6. LCV Pressure Limitations

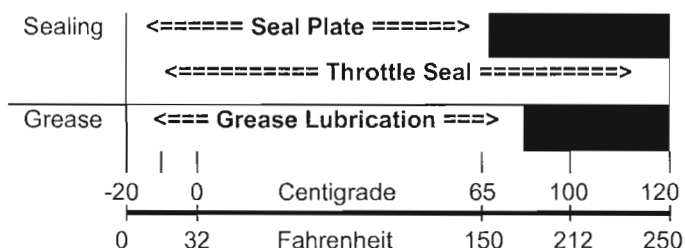


Figure 7. LCV Temperature Limitations

### 4.4 Shaft Limitation Charts

Slurry pump duties cover a wide range of pump rotational speeds and slurry specific gravities. As a result, it is desirable to have a range of shaft sizes available to permit the optimization of each application.

The LCV range of pumps allows for two or three different shaft sizes to be applied to each hydraulic size. Selection of a shaft size is based on four parameters: critical speed, shaft deflection, bearing life and shaft strength.

In the charts Appendix A, these parameters are defined for each standard length of cantilever and standard combinations of LCV hydraulics and mechanical end. The charts cover a range of operating conditions from 25% to 125% of the best efficiency flowrate at three discrete slurry specific gravities: 1.0, 1.25, and 1.5.

In selecting a shaft size, one plots the various duties of head and flow on each chart to determine the acceptability of the limiting criteria. Shown are the maximum operating speed, first critical speed zone, acceptable shaft deflection and bearing life. Shaft strength is not shown since it is adequate when limited by the above.

- 1.) *Maximum Operating Speed.* The limit on revolutions per minute are given in the lines.
- 2.) *First Critical Speed.* Lines are given for the first critical speed zone (FC) when the critical speed is below the maximum operating speed. Operating

within these bounds may cause unacceptable vibration which can be severe, depending on the application and stiffness on the installation. Operating above the first critical speed zone may also cause severe vibration as the pump comes up to speed through the first critical speed zone.

- 3.) *Shaft Deflection at the Shaft Seal.* Lines are given for allowable deflection at the shaft seal. Exceeding these limits may lead to contact of rotating components with stationary components.

- 4.) *Bearing Life.* Lines are given for 100,000 hours which is considered standard for LCV applications. This high value is required in order to limit heat generation and resultant re-lubrication intervals in the vertical application.

### 4.5 Effects of Solids on Head and Efficiency

In slurry pumping, the interaction of the solids with the liquid results in friction losses that reduce the operating head and efficiency of the pump. The magnitude of this effect is governed by particle size, specific gravity, volumetric concentration, percentage of fines and the properties of the carrier liquid. In many typical slurry pumping applications, it ranges from zero to 15%, although values exceeding 30% are possible. Three typical cases are:

	Case 1	Case 2	Case 3
Solids type	coal	silica	silica
Solids S.G.	1.7	2.65	2.65
Solids D50	1 mm	0.2 mm	10 mm
Slurry S.G.	1.2	1.2	1.4
% Fines	< 5%	< 5%	< 5%
Liquid type	water	water	water
Pump	150-500 (6" x 20")	150-500 (6" x 20")	150-500 (6" x 20")
% Head reduction	8.4 %	2.6 %	13.0 %
% Efficiency reduction	10.3 %	2.6 %	14.5 %

Solids effect should always be accounted for in the selection a slurry pump. For solids effect values for a specific application, consult the GIW Sysel program; the book, "Slurry Transport Using Centrifugal Pumps", or contact your GIW / KSB sales office.

## 5 Construction

The construction of the slurry pump is designed to give maximum resistance to solids while simplifying maintenance. Since the slurry pump is required to cover a wide range of duties from fine to coarse, dilute to dense, and inert to corrosive, several types of construction are available

### 5.1 Wet End

Two standard, wet-end configurations are available in the LCV range:

- 1.) Hard Metal. (Figure 8). Single-wall casing, impeller and suction liner of high-chrome white iron. Suitable for high-discharge head, all particle sizes up to maximum sphere passage and mildly corrosive slurries. Custom materials available for highly corrosive slurries.

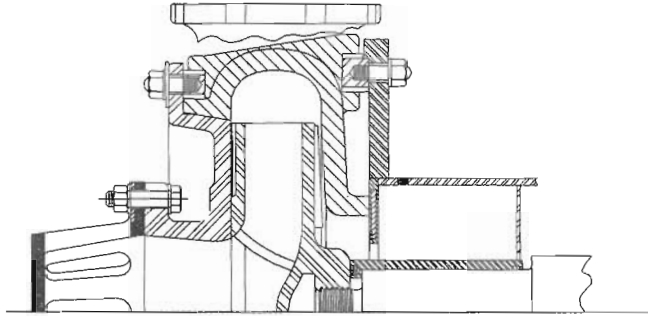


Figure 8. LCV Hard Metal Wet End

### 5.1.1 Casing

All casings carry 125 pound, ANSI flange bolting patterns. Adapters for conversion to DIN flanges are available. Average wear material thicknesses are given in Figure 10.

Nominal Pump Size	Hard Metal Casing	
	Belly	Side Wall
50-230 (2" x 9")	18 (0.7)	18 (0.7)
80-300 (3" x 12")	20 (0.8)	20 (0.8)
100-400 (4" x 16")	25 (1.0)	25 (1.0)
150-500 (6" x 20")	30 (1.2)	30 (1.2)
200-610 (8" x 24")	30 (1.2)	30 (1.2)
250-660 (10" x 26")	35 (1.4)	35 (1.4)
300-710 (12" x 28")	45 (1.75)	45 (1.75)

Figure 10. Casing Thicknesses in mm (inches)

### 5.1.2 Impeller

Standard impeller designs are available in closed shroud or open shroud designs. Their interchangeability with the basic wet-end types is shown in Figure 11.

Pump size	Plug	Closed Shroud	Open Shroud
LCV 50-230	1.75"	6178D	4538C
LCV 80-300	1.75"	6179D	4539C
LCV 100-400	1.75"	6180D	4540C
LCV 150-500	S9194	5216D	4541C
LCV 200-610	3.50"	6181D	4542C
LCV 250-660	3.50"	6182D	4543C

LCV 300-700	3.50"	6183D	4544C
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Figure 11. Impeller Selection Chart

Standard impellers are double shrouded with sphere passage and vane thickness as shown in Figure 12.

Nominal Size	Impeller Version	
	Sphere Passage	Vane Thickness
50-230 (2" x 9")	33 x 23 (1.3 x 0.9)	16 (0.63)
80-300 (3" x 12")	51 x 25 (2.0 x 1.0)	21 (0.83)
100-400 (4" x 16")	61 x 38 (2.4 x 1.5)	25 (0.98)
150-500 (6" x 20")	89 x 76 (3.5 x 3.0)	19 (0.75)
200-610 (8" x 24")	107 x 102 (4.2 x 4.0)	21 (0.81)
250-660 (10" x 26")	142 x 122 (5.6 x 4.8)	22 (0.88)
300-710 (12" x 28")	180 x 132 (7.1 x 5.2)	25 (1.0)

Figure 12. Impeller Sphere Passage and Average Vane Thickness in mm (inches)

Nominal Size	Design Version	
	Dry	Water Filled
50-230 (2" x 9")	0.063 (1.49)	0.067 (1.60)
80-300 (3" x 12")	0.263 (6.19)	0.281 (6.66)
100-400 (4" x 16")	0.822 (19.5)	0.893 (21.2)
150-500 (6" x 20")	1.54 (36.7)	1.97 (46.9)
200-610 (8" x 24")	4.72 (112)	5.94 (141)
250-660 (10" x 26")	7.63 (181)	9.99 (237)
300-710 (12" x 28")	13.7 (324)	17.5 (416)

Figure 13. Full Size Impeller Mass

Moments of Inertia in:  $\text{kg} \cdot \text{m}^2$  ( $\text{lbm} \cdot \text{ft}^2$ )

$$\text{Impellers } wr^2 = (wr_{SG=1}^2 - wr_{dry}^2) * SG + wr_{dry}^2$$

### 5.1.3 Side Liner

The hard-metal wet end uses a one-piece, hard iron, suction wear plate on all sizes.

## 5.2 Mechanical End

Pump Size	Cantilever Dwg #	Cantilever	Cantilever Length (mm)	FRAME 1		FRAME 2		FRAME 3		FRAME 4
SHAFT				90mm	110mm	110mm	130mm	150mm	170mm	200mm
LCV 50-230 2X3 LCV-9	4455C	900 1200 1500	713 1013 1313	2200X 2201X	2202X					
LCV 80-300 3X4 LCV-12	7738D	900 1200 1500	695 980 1280			3200X 3201X	3202X			
LCV 100-400 4X6 LCV-16	7591D	900 1200 1500	705 1005 1305			3203X 3204X	3205X			
LCV 150-500 6X8 LCV-20	7762D	1200 1500 1800 2100	850 1150 1450 1750					4201X 4202X 4203X	4204X	
LCV 200-610 8X10 LCV-24	4379C	1200 1500 1800 2100	776.5 1076.5 1376.5 1676.5					4205X 4206X	4207X	5203X
LCV 250-660 10X12 LCV-26	4563C	1200 1500 1800 2100	661 961 1261 1561							5204X 5205X 5206X 5207X
LCV 300-700 12X14 LCV-28	4566C	1200 1500 1800	651 951 1251							5208X 5209X 5210X

### 5.2.1 Support Column

The support column is made of mild steel piping and plate. The bottom of the mounting plate is urethane coated. Concentric fits between the bearing assembly and shaft seal provide alignment without the need for shimming. It also supports the standard motor mount.

The bearings are lubricated with grease. Recommended shaft speed limitations are given below. See the *LCV Maintenance Manual* for more information regarding lubrication.

Nominal Frame Size	Limiting Speed for Grease Lubrication (rpm)			
	Class 1	Class 2	Class 3	Class 4
1	2500	2100	1800	1500
2	1800	1650	1450	1200
3	1350	1200	1000	850
4	1000	875	750	625

### 5.2.2 Bearings and Lubrication

The bearing arrangement is shown in Figure 14. A double row, taper roller bearing carries the drive load and hydraulic axial thrust. A double row, spherical roller bearing carries the impeller end radial load. Bearings are pressed to the shaft, which then slides into the housing from the drive end.

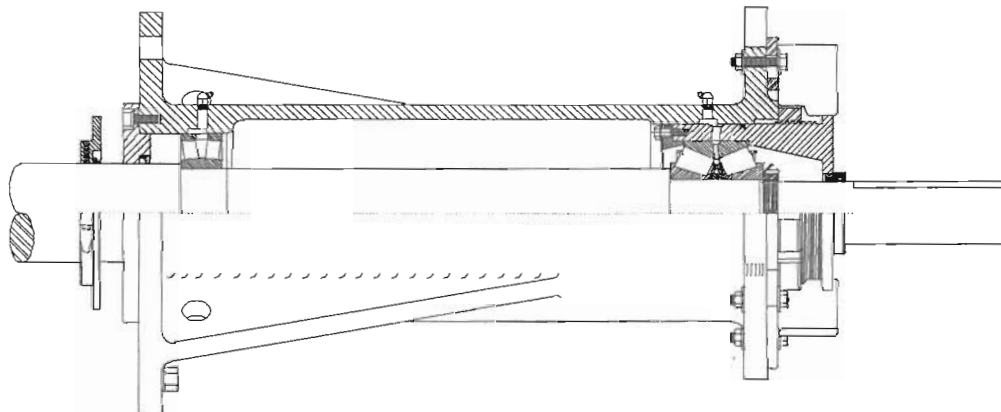


Figure 14. LCV Bearing Assembly



The bearing housing seal on the thrust end are Inpro® VBX style bearing isolators. In addition to the standard Inpro® features, these isolators contain an internal o-ring that provides a seal against contamination while the pump is not running then spins free by centrifugal force during operation. Impeller end sealing has optional Inpro seal (Fig. 15) or lip seal (Fig.16).

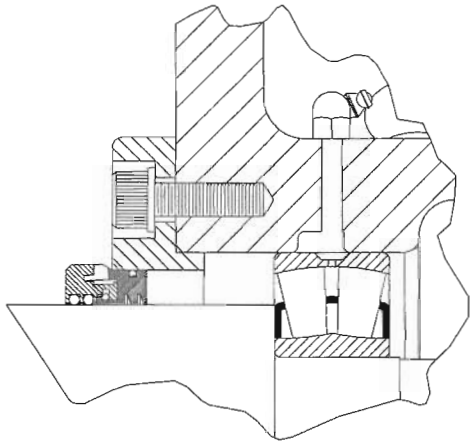


Figure 15. Optional LCV Inpro® Bearing Isolator

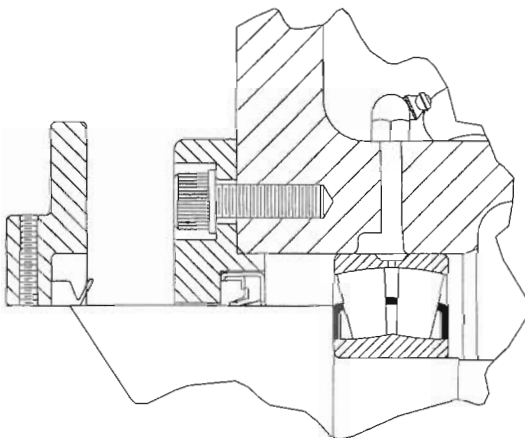


Figure 16. Standard Lip Seal with Flinger

### 5.2.3 Shaft Seal Design

Incidental high shaft deflections due to long cantilever length, require use of non-contacting wet end sealing. The standard seal plate prevents excess leakage of the pumped fluid that would effect pump performance. However a certain amount of the pumped fluid will be recirculated back into the sump. The seal plate is constructed of a urethane coated steel plate. The radial seal clearances are shown below:

	Frame 1	Frame 2	Frame 3	Frame 4
Seal Clearance	.188"	.188"	.250"	.250"

The optional throttle bushing maintains the same clearances as the seal plate. It is constructed of hard metal (28G or T90G). It is advisable to use the throttle

bushing in highly abrasive or corrosive materials, or when the S.G. exceeds 1.25.

## 5.3 Allowable Flange Loadings

Allowable flange loadings are according to a modified version of French Standard NF E 44-145 as shown in Figure 18.

### 5.3.1 Suction Extension Piping

The standard pump is configured with a suction strainer. However an extension pipe can be installed if adequately supported. Due consideration should be given to flange loadings, additional vibration and performance penalties due to entrance losses.

## 5.4 Drive Arrangements

The standard drive arrangement for LCV slurry pumps is side mounted v-belt. Dimensional charts for this is shown in section 9.

The standard mount is a low cost design with limitations on motor size, weight and center distance. A diagram of the motor mounting limitations can be found in section 9.

# 6 Materials

## 6.1 Material Combinations

The table below shows some of the standard material combinations available for the LCV range. Other materials may be available. Consult your GIW / KSB sales office for more information.

Part No.	Item	Standard Metal	Corrosion Resistant Metal
101	Shell	Gasite <sup>®</sup> 28G	Gasite <sup>®</sup> T90G
13-19	Suction Liner	Gasite <sup>®</sup> 28G	Gasite <sup>®</sup> T90G
16-1	Suction Plate	Fab Steel	Fab Steel or Stainless Steel
16-3	Suction Wear Plate	Gasite <sup>®</sup> 28G	Gasite <sup>®</sup> T90G
18-2	Support Column	Mild Steel	
210	Shaft	4150 Steel	4150 or Stainless Steel
230	Impeller	Gasite <sup>®</sup> 28G	Gasite <sup>®</sup> T90G
350	Bearing Housing	Class 40 Gray Iron	
451	Seal Plate	Urethane Coated Mild Steel	
451	Throttle Seal	Gasite <sup>®</sup> 28G or T90G	
524	Shaft Sleeve	Carbide Coated Steel	Carbide Coated or Stainless Steel

1) Throttle seal recommended for severe duty.

**Figure 17. LCV Materials Combinations**

## 6.2 Materials Selection

In selecting the appropriate materials for each slurry duty, one must consider the size, concentration and abrasivity of the solids as well as the chemical nature of the slurry. General guidelines for these are given below. For more information pertaining to specific applications, contact the GIW / KSB sales office.

Also important are the temperature and pressure limitations as given in Figures 6 and 7.

### 6.2.1 Gasite 28G<sup>®</sup> High Chrome White Iron

This is the standard hard-metal material for LCV slurry pumps. It is highly resistant to abrasive wear, having a typical performance of 5 to 10 times that of hardened steel. Suitable for all particle sizes, concentrations and abrasivities, and for most chemical solutions within 3 to 13 pH. Suitable for flue gas desulfurization duties of 4 pH with 10,000 to 20,000 PPM chlorides.

### 6.2.2 Gasite T90G<sup>®</sup> Corrosion Resistant White Iron

Provides performance superior to 28% chrome white iron and CD4MCu class alloys in slurry environments which are both erosive and corrosive. Suitable for all particle sizes, concentrations and abrasivities, and for most chemical solutions within 1 to 15 pH. Suitable for flue gas desulfurization duties of 1 pH with up to 100,000 PPM chlorides.

### 6.2.5 Polyurethane

A two part elastomer resin of higher hardness and strength than most rubbers, this is the standard material for LCV elastomer lined impellers. Its strength provides superior resistance to mechanical damage during operation. It also exhibits excellent resistance to abrasion of fine particles, and good chemical resistance.

## 7 Spare Parts

Due to the erosive action of the slurry, many of the wetted components of the pump may require replacement in the course of normal maintenance. Inspection or overhaul of the mechanical components may also lead to the replacement of certain parts.

The following are recommended lists of parts to have on hand for normal maintenance and inspection. The quantities of parts kept in store will depend upon the severity of the slurry duty and the number of units operating. Maintenance practices may also favor keeping fully built sub-assemblies or complete pumps on hand in some cases. Previous experience in similar duties often provides the best experience. If in doubt, contact the GIW / KSB sales office for specific recommendations.

#### Wet End

- Casing
- Impeller
- Side Liner
- Gasket Kit

#### Wet End Sealing

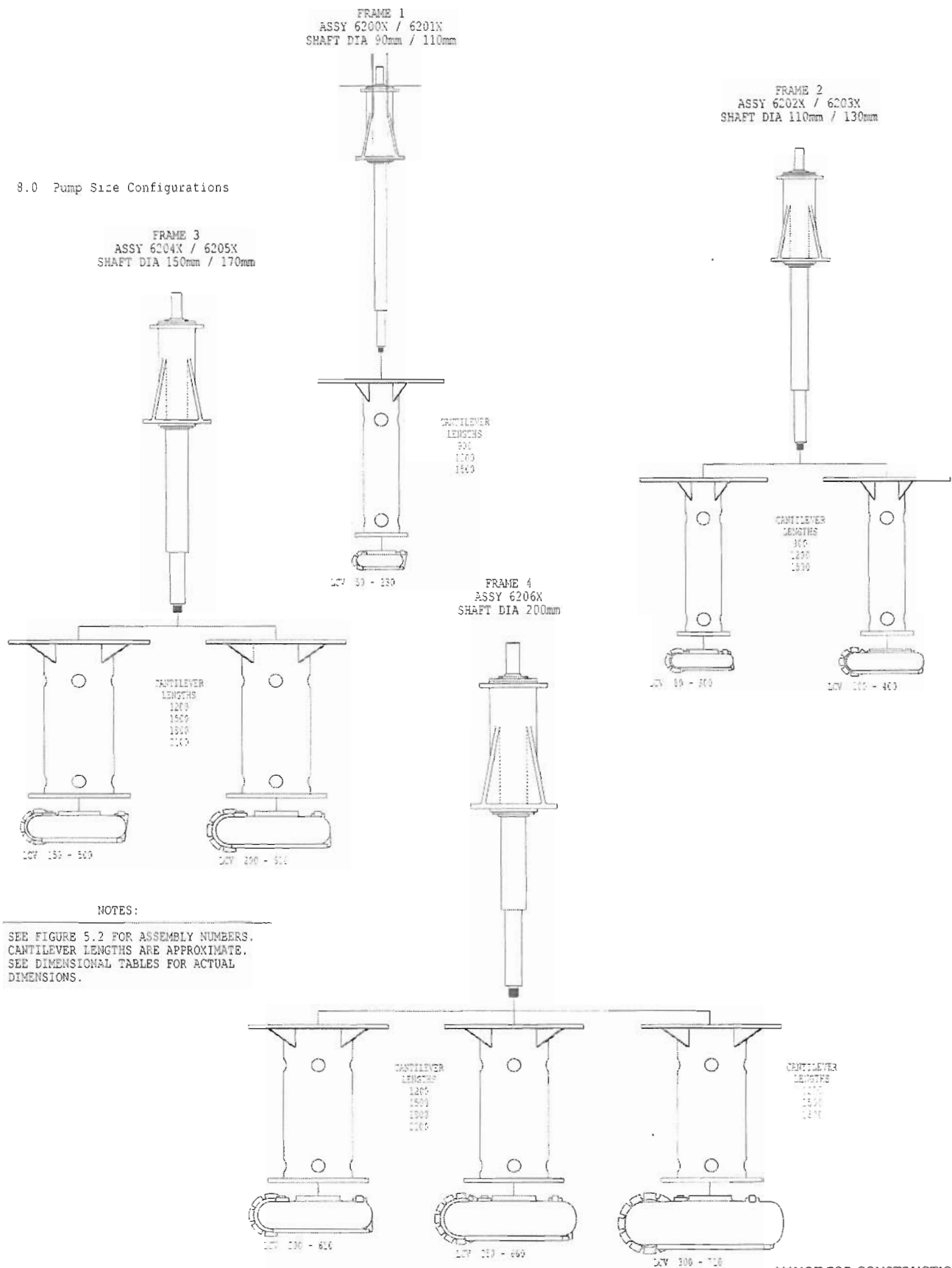
- Shaft Sleeve
- Seal Plate or Optional Throttle Seal
- Gasket Kit

#### Bearing Assembly

- Bearings
- Gasket Kit

## 8.0 Pump Size Configurations

### 8.0 Pump Size Configurations



## A. Appendix A - Shaft Selection Charts

The following 26 pages contain the shaft selection charts described in Section 4.4. Please refer to Section 4.4 and read the instructions below before using these charts. (For electronic link see page 1 Appendix A.)

In each case, lines for determining the limits of application for the standard LCV pump size / shaft size combinations are given over a range of slurry specific gravities (SG) and flowrates:

- Specific gravities: 1.0, 1.25, and 1.5.
- Flowrates: 25% to 125% of best efficiency flow.

A maximum rpm line is also given on each chart. This line represents the maximum class 1 operating speed. The actual maximum operating speed for your application may be lower due to wear life considerations, or pressure limitations which are not addressed by these charts. For more information see Sections 4.1, 4.2 and 4.3

### To use the charts:

1. Go to the set of charts for the pump size, shaft diameter and length of cantilever combination of your choice.
2. Determine your duty point flowrates, heads and slurry specific gravities (SG). Any operating point at which the pump will remain for an extended period of time should be considered. 500,000 shaft revolutions may be used as a generic definition of "extended time". To convert this to hours:  
$$\text{Hours} = 8,333 / (\text{duty RPM})$$
3. If working in metric units, convert your duty point flowrates and heads to the U.S. units used in these charts:  
$$\text{feet} = \text{meters} \times (3.28)$$
$$\text{GPM} = (\text{meters}^3 / \text{hour}) \times (4.40)$$
$$\text{GPM} = (\text{liters} / \text{sec}) \times (15.9)$$
4. Plot your duty points (flow and head) on each chart of interest. You may wish to make extra copies of the charts for this purpose.
5. On the selected chart, locate the maximum operating speed (rpm limit). If your duty is above this line then to attain the needed performance will require going to a bigger pump.
6. Determine if a first critical speed zone (FC) exists at your duty. If such is the case then an alternate running speed or length of cantilever should be selected. Operating within these bounds may cause unacceptable vibration, which can be severe, depending on the application and stiffness on the installation. Operating above the first critical speed zone may also cause severe vibration

as the pump comes up to speed through the first critical speed zone.

6. On each chart, locate the line of constant SG corresponding to your duty. If your duty SG is not equal to one of the three given values, interpolate a line. If your duty SG line does not appear on the chart, then it is above the maximum RPM line and all applications below the maximum RPM line are acceptable. If your SG is above 1.5, contact your GIW / KSB representative.
7. For BEAM DEFLECTION AT SHAFT SEAL:  
If all of your duty points fall *below* the constant SG line for deflection, then this shaft size is acceptable for your application.

If not, a larger shaft size or shorter length of cantilever must be selected.

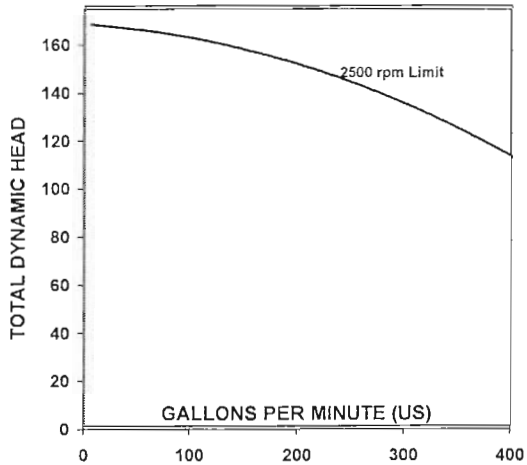
8. For BEARING LIFE:  
If all of your duty points fall *below* the constant SG line for bearing life, then this shaft size is acceptable for your application.

If not, a larger frame size or a lower bearing life tolerated.

**LCV 50-225 CLOSED IMPELLER (Frame 1 with 90mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 2500rpm OR IN THE CRITICAL SPEED ZONE (FC)**

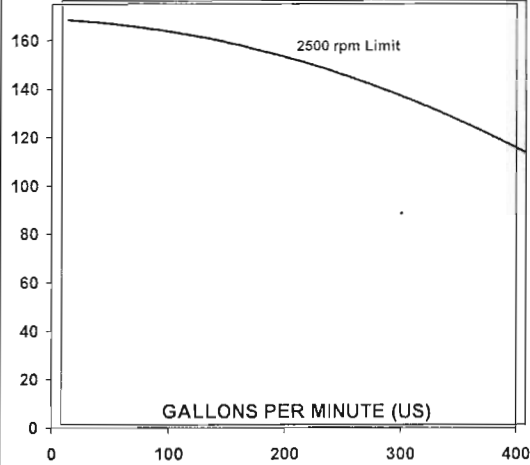
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

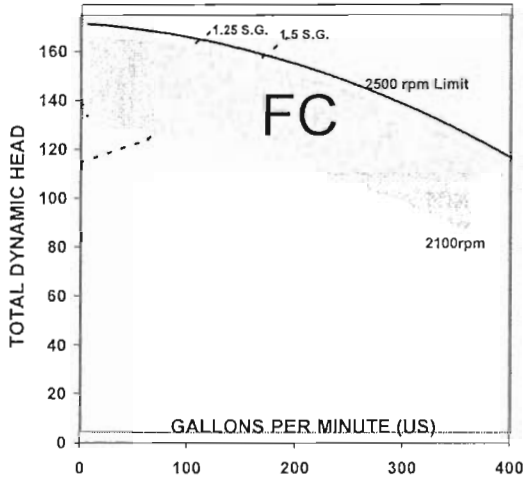


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

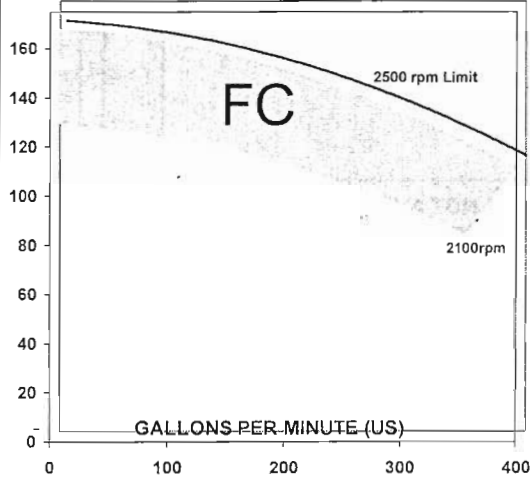
**900mm CANTILEVER LENGTH**



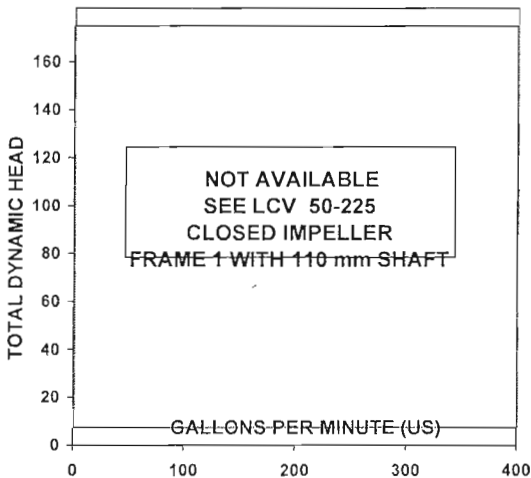
**1200mm CANTILEVER LENGTH**



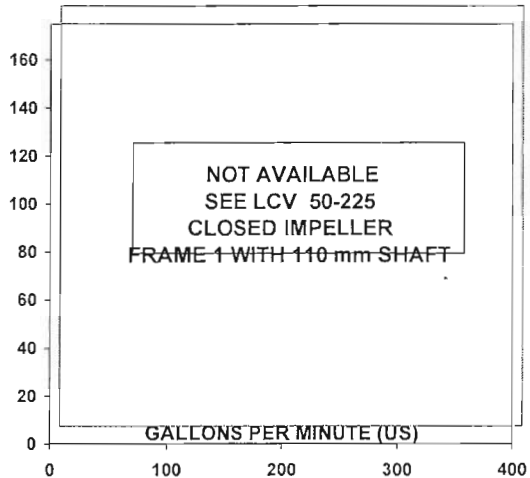
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



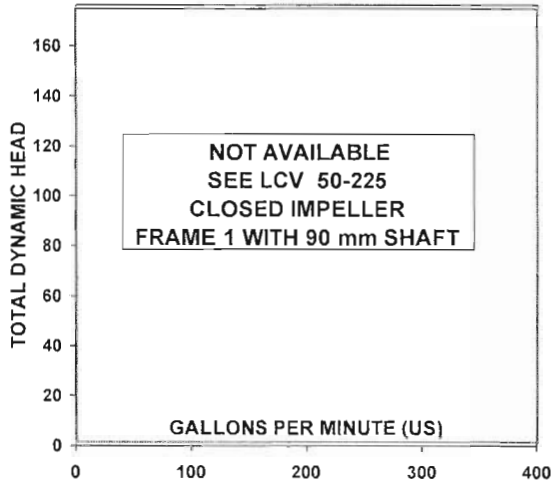
**1500mm CANTILEVER LENGTH**



**LCV 50-225 CLOSED IMPELLER (Frame 1 with 110mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 2500rpm OR IN THE CRITICAL SPEED ZONE (FC)**

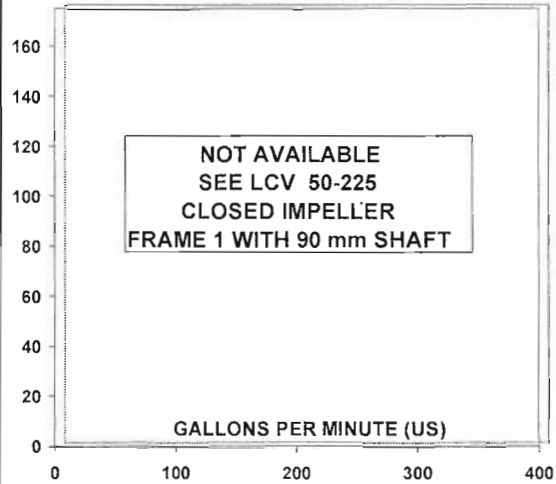
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

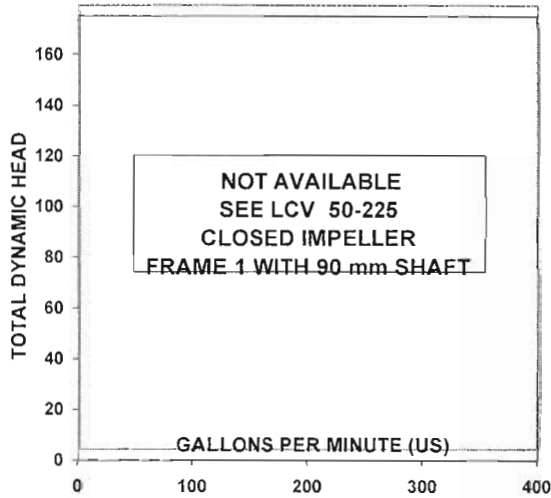


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

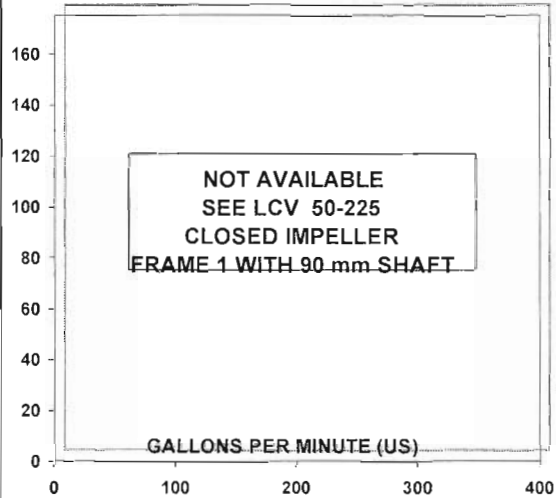
**900mm CANTILEVER LENGTH**



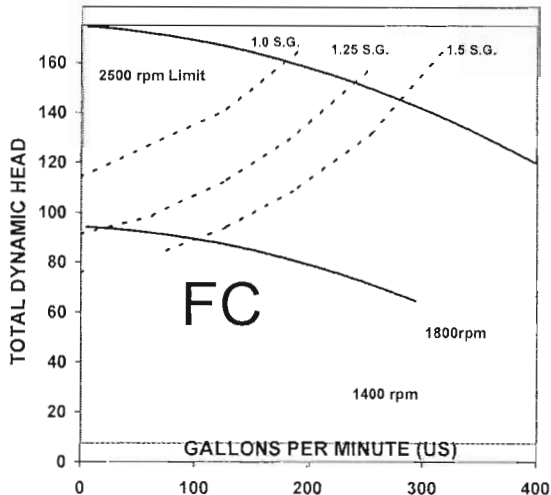
**1200mm CANTILEVER LENGTH**



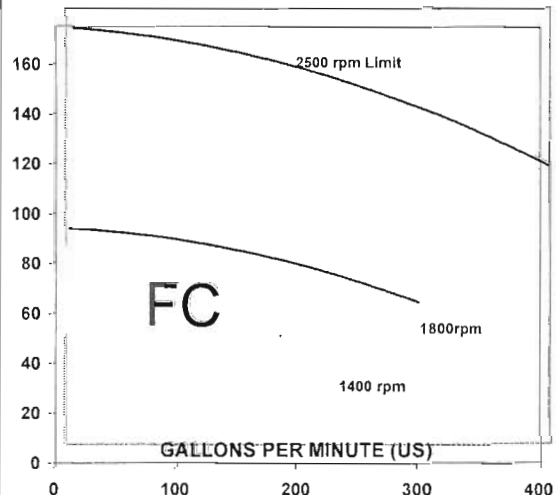
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



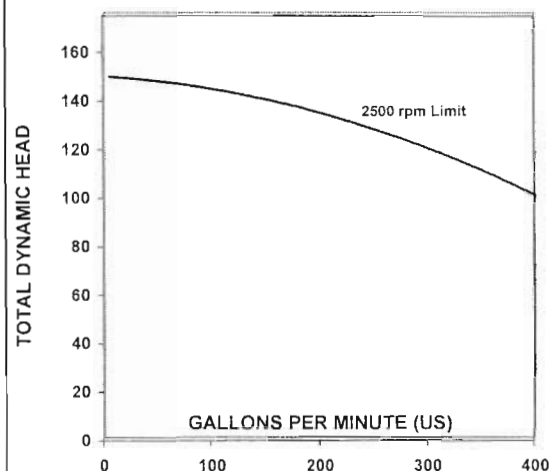
**1500mm CANTILEVER LENGTH**



**LCV 50-225 OPEN IMPELLER (Frame 1 with 90mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 2500rpm OR IN THE CRITICAL SPEED ZONE (FC)**

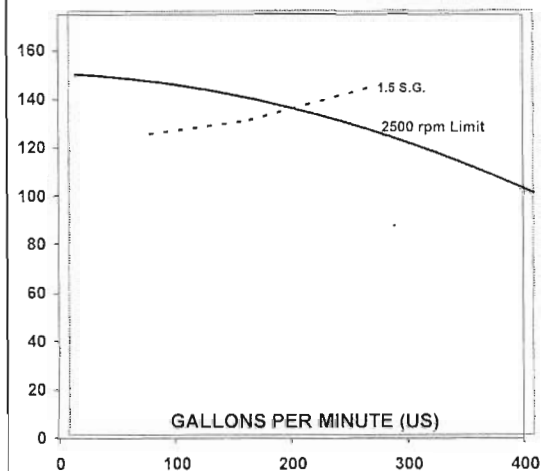
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

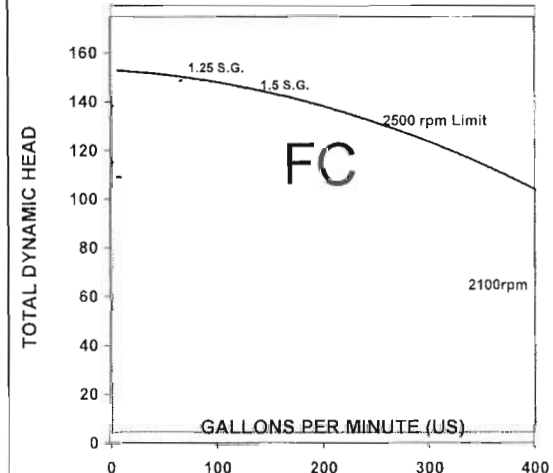


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

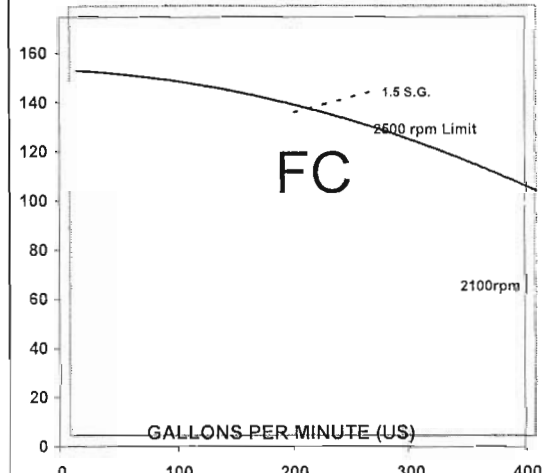
**900mm CANTILEVER LENGTH**



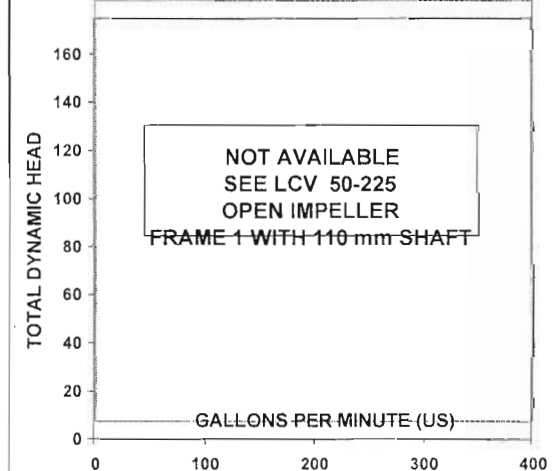
**1200mm CANTILEVER LENGTH**



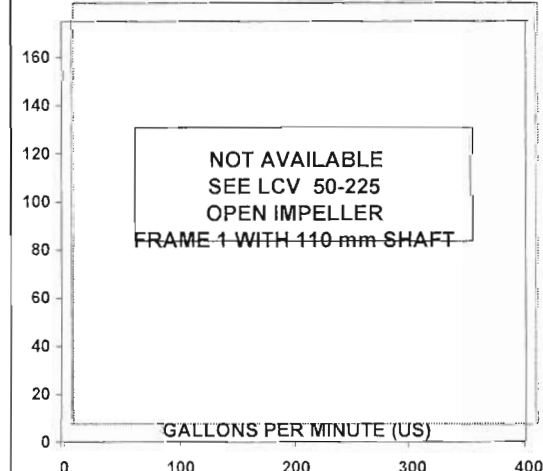
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



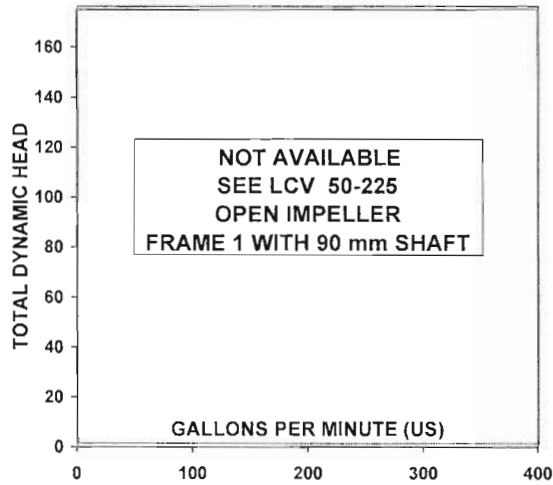
**1500mm CANTILEVER LENGTH**



**LCV 50-225 OPEN IMPELLER (Frame 1 with 110mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 2500rpm OR IN THE CRITICAL SPEED ZONE (FC)**

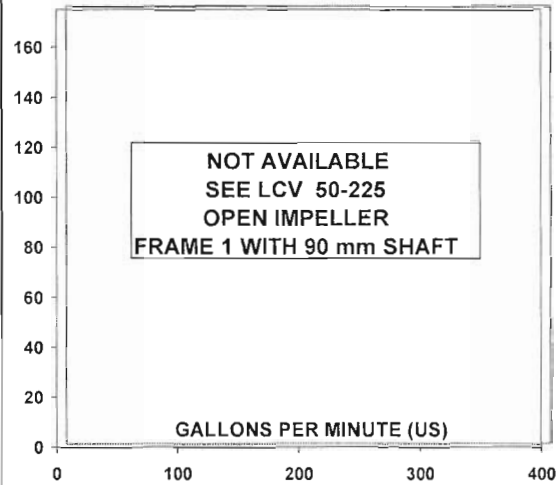
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

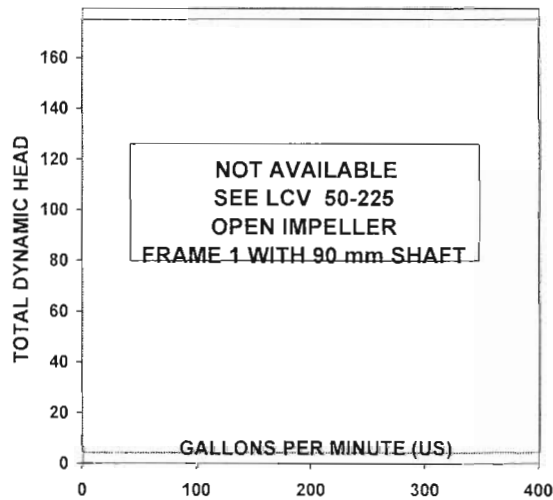


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

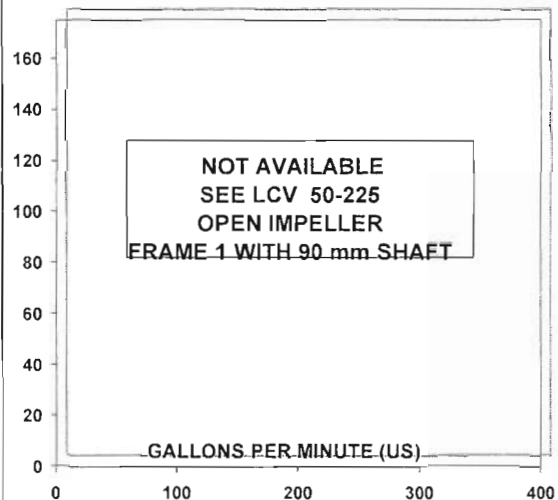
**900mm CANTILEVER LENGTH**



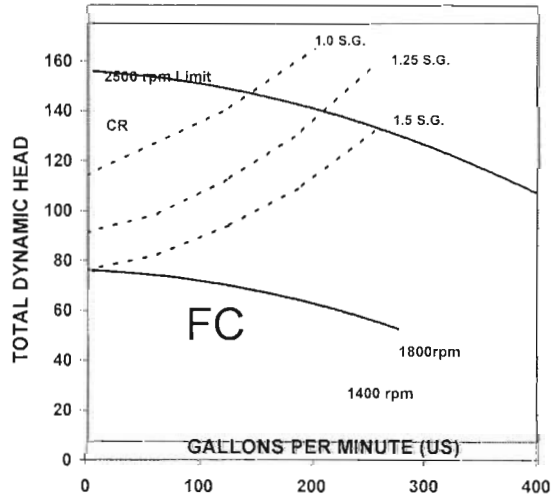
**1200mm CANTILEVER LENGTH**



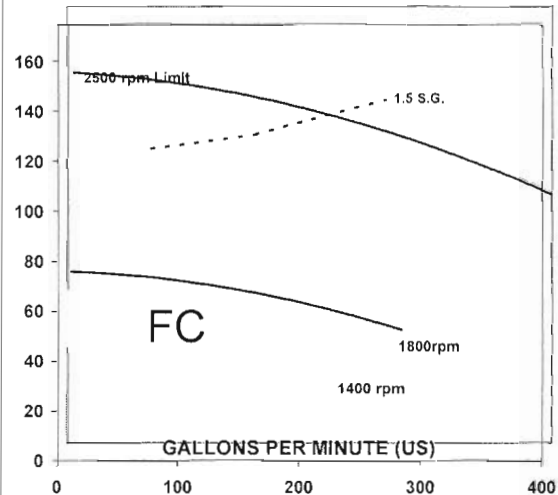
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**

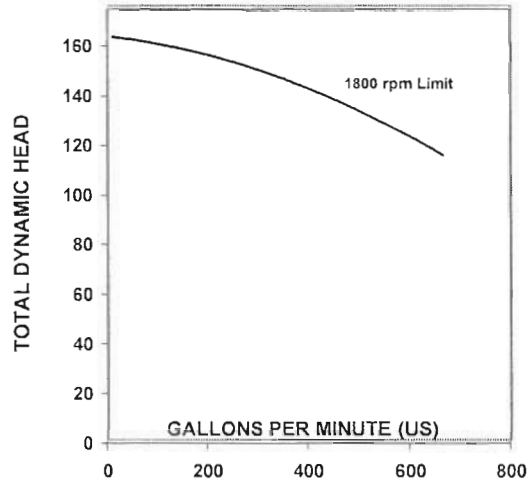




**LCV 80-300 CLOSED IMPELLER (Frame 2 with 110mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1800rpm OR IN THE CRITICAL SPEED ZONE (FC)**

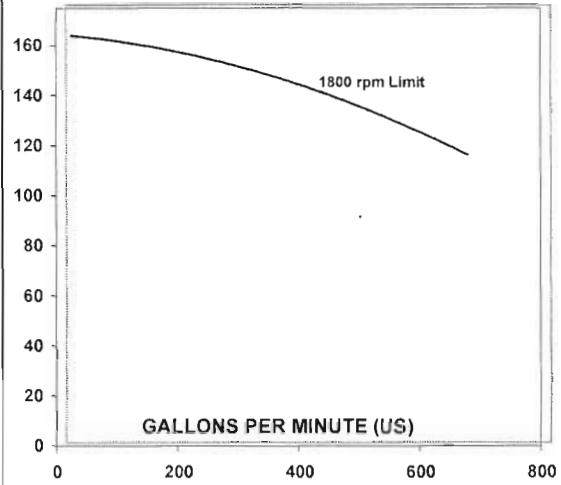
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

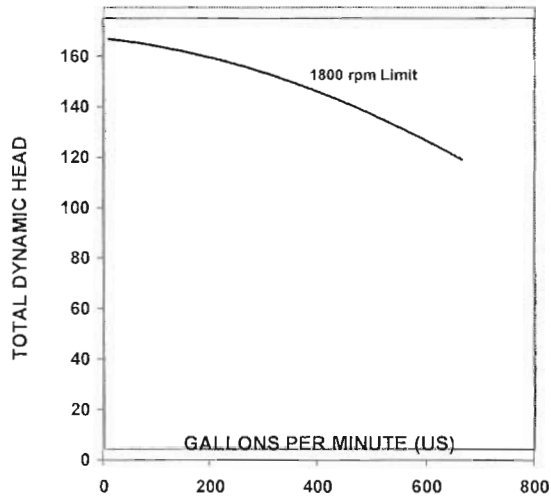


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

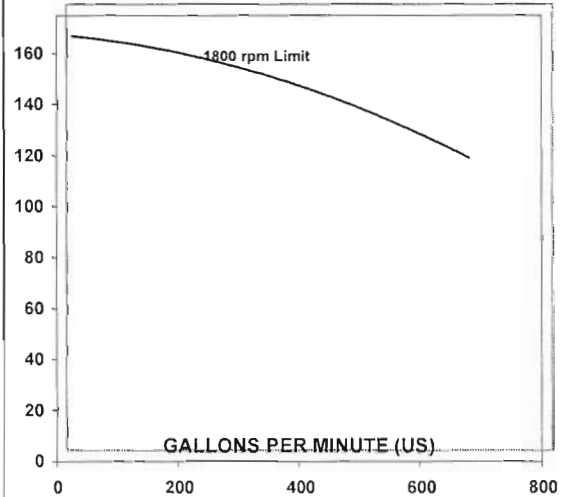
**900mm CANTILEVER LENGTH**



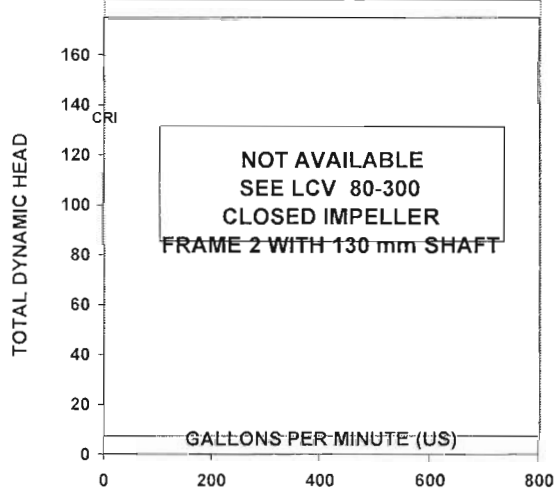
**1200mm CANTILEVER LENGTH**



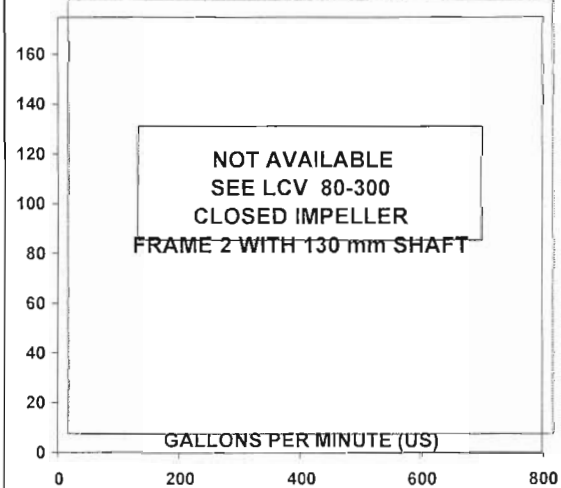
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**

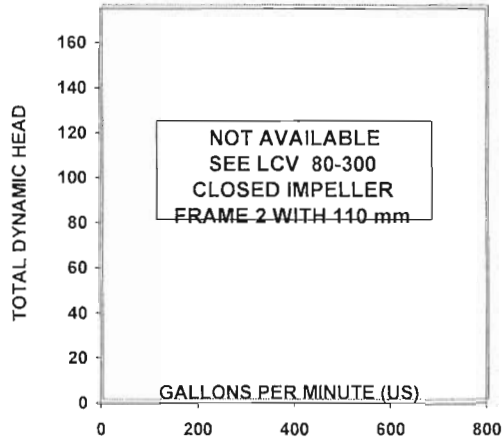


# LCV 80-300 CLOSED IMPELLER (Frame 2 with 130mm Diameter Shaft)

DO NOT OPERATE ABOVE 1800rpm OR IN THE CRITICAL SPEED ZONE (FC)

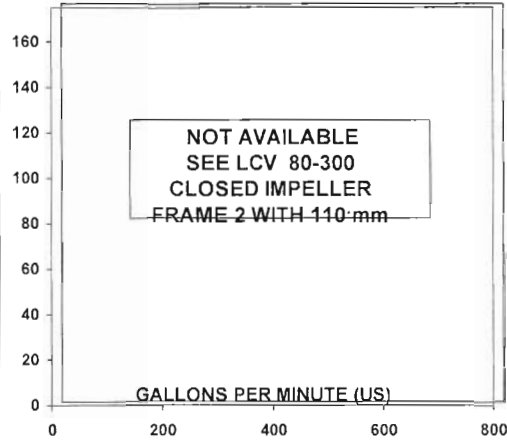
DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

900mm CANTILEVER LENGTH

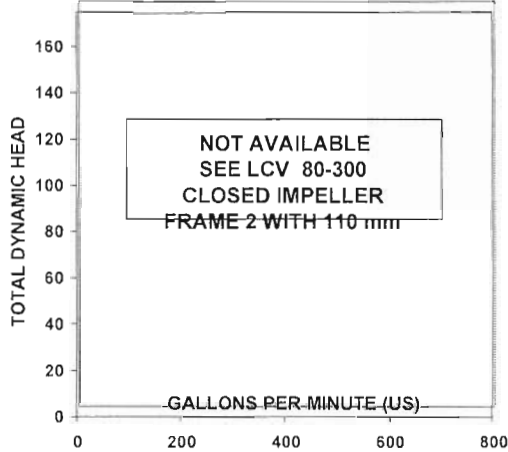


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

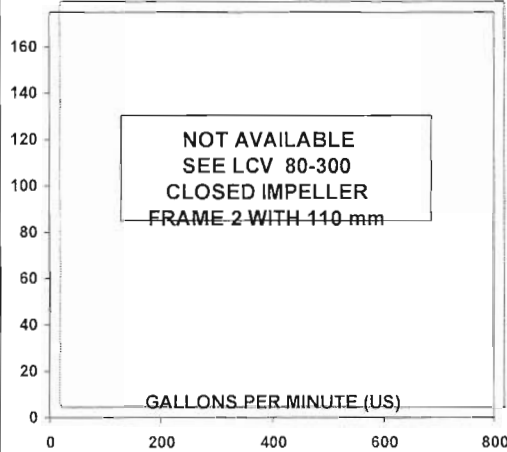
900mm CANTILEVER LENGTH



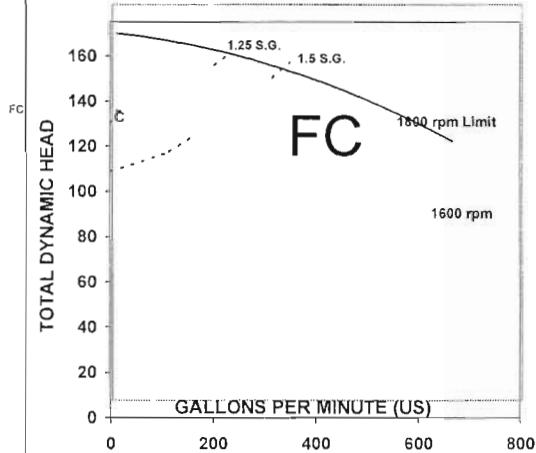
1200mm CANTILEVER LENGTH



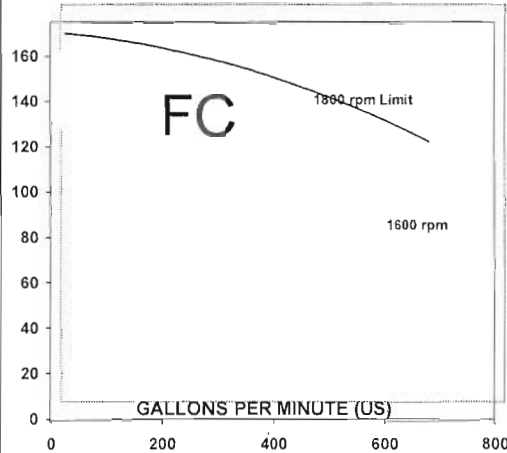
1200mm CANTILEVER LENGTH



1500mm CANTILEVER LENGTH



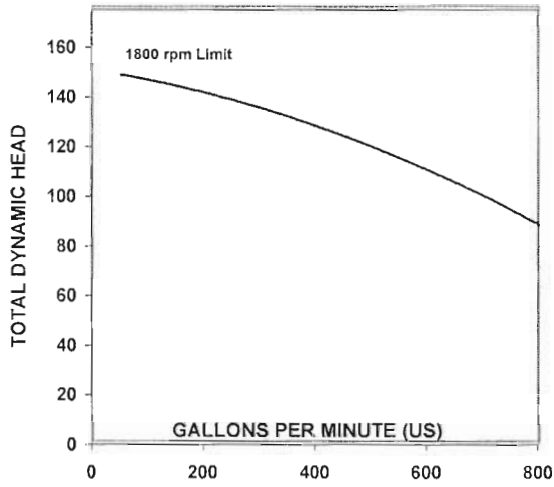
1500mm CANTILEVER LENGTH



**LCV 80-300 OPEN IMPELLER (Frame 2 with 110mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1800rpm OR IN THE CRITICAL SPEED ZONE (FC)**

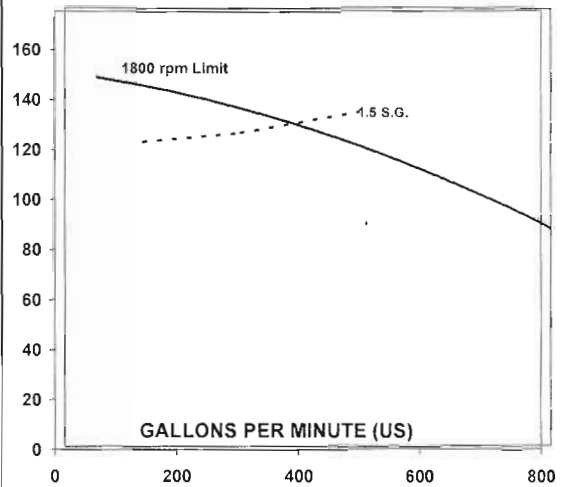
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

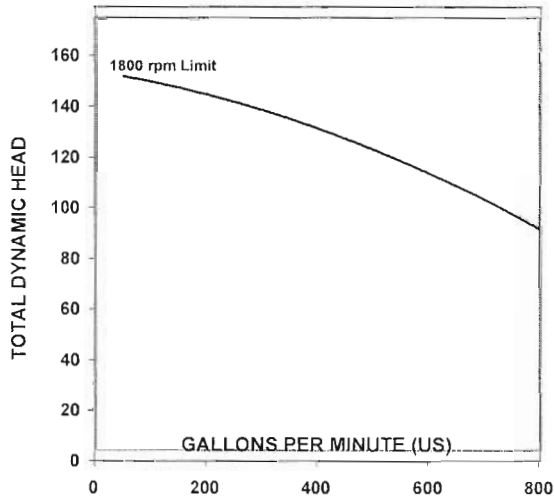


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

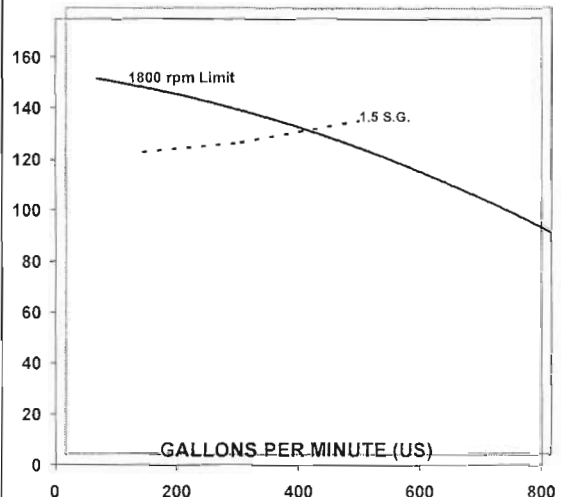
**900mm CANTILEVER LENGTH**



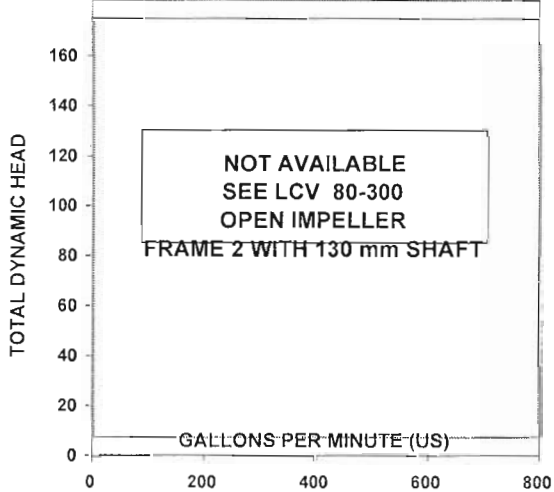
**1200mm CANTILEVER LENGTH**



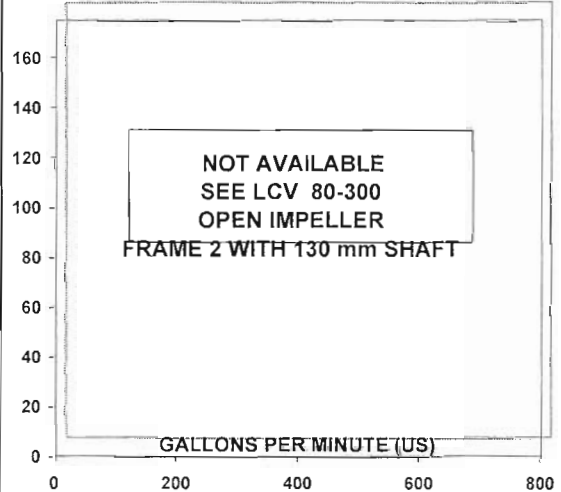
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



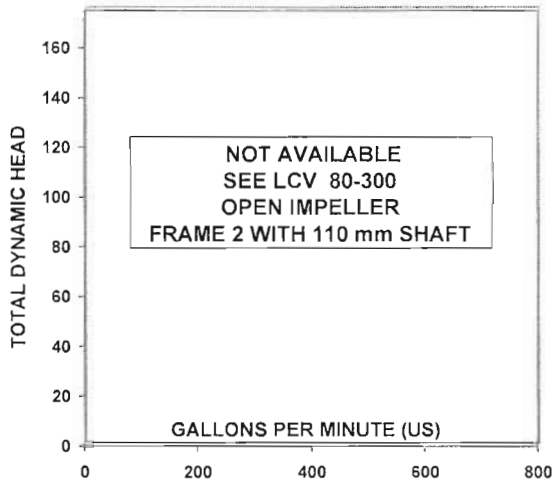
**1500mm CANTILEVER LENGTH**



**LCV 80-300 OPEN IMPELLER (Frame 2 with 130mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1800rpm OR IN THE CRITICAL SPEED ZONE (FC)**

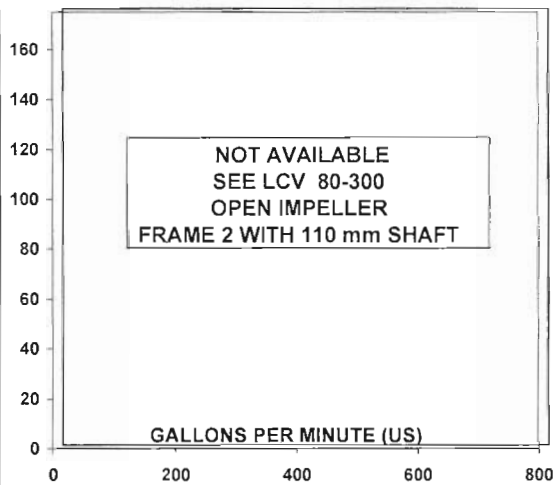
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

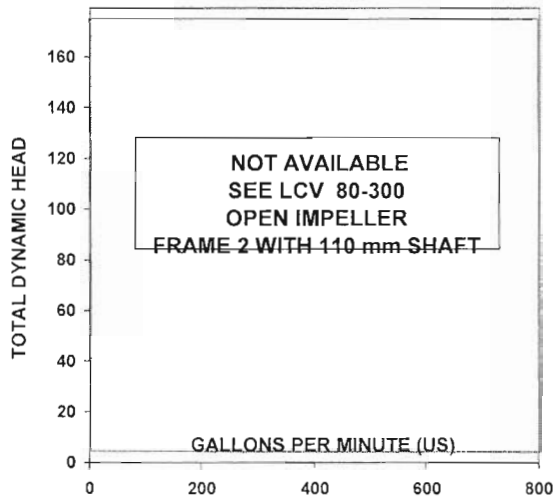


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

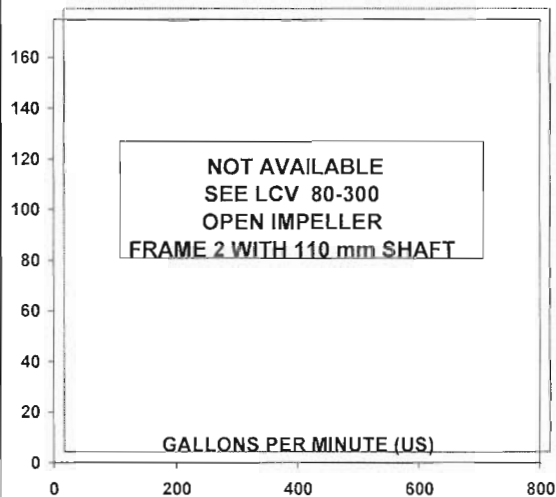
**900mm CANTILEVER LENGTH**



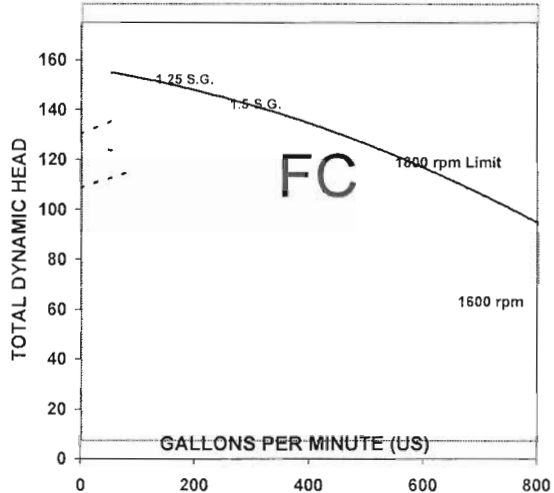
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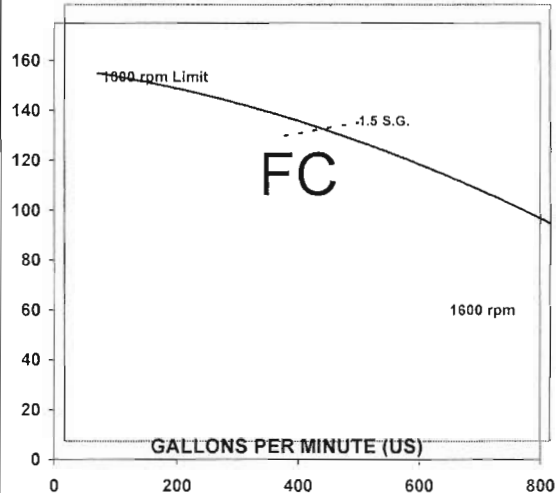
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



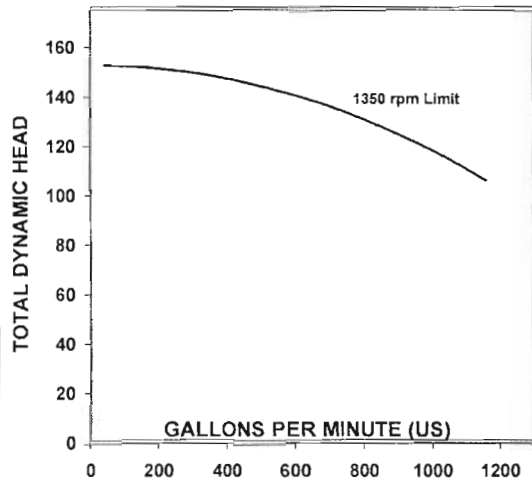
**1500mm CANTILEVER LENGTH**



**LCV 100-400 CLOSED IMPELLER (Frame 2 with 110mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1350rpm**

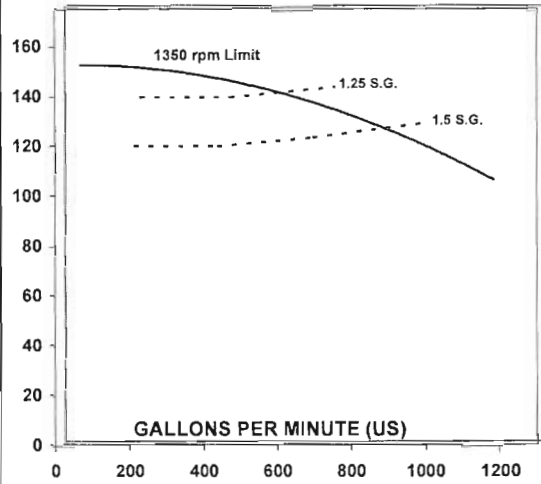
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

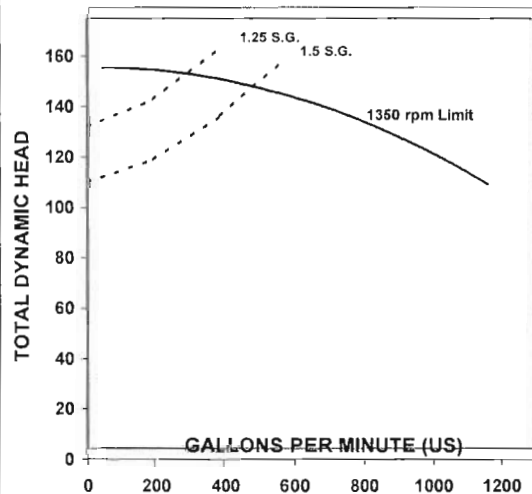


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

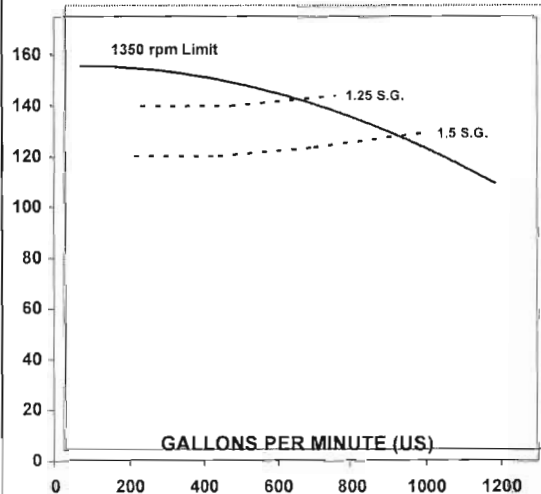
**900mm CANTILEVER LENGTH**



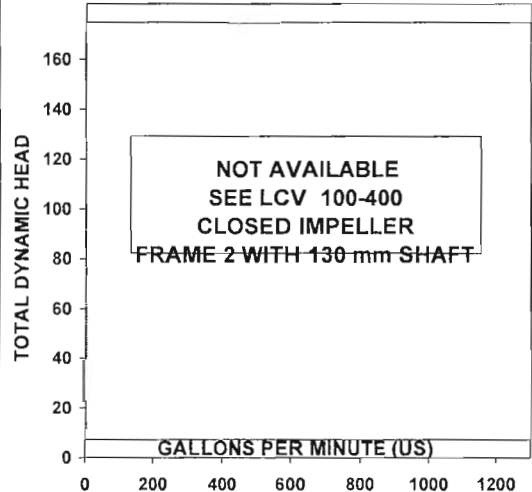
**1200mm CANTILEVER LENGTH**



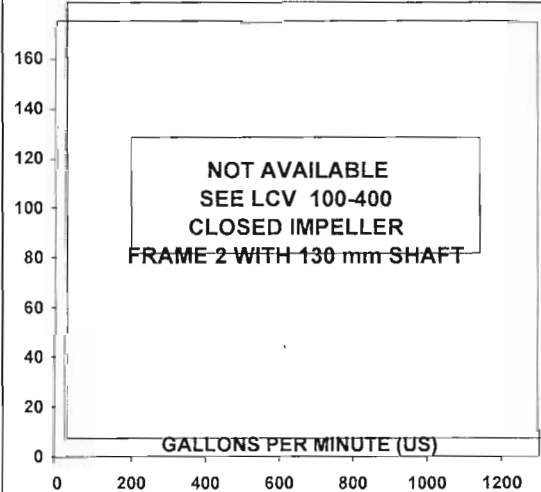
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



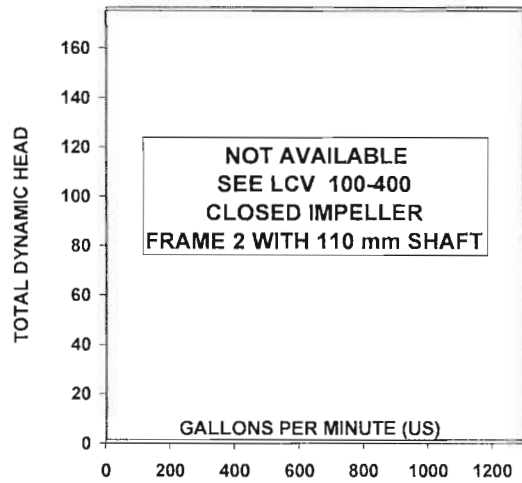
**1500mm CANTILEVER LENGTH**



**LCV 100-400 CLOSED IMPELLER (Frame 2 with 130mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1350rpm**

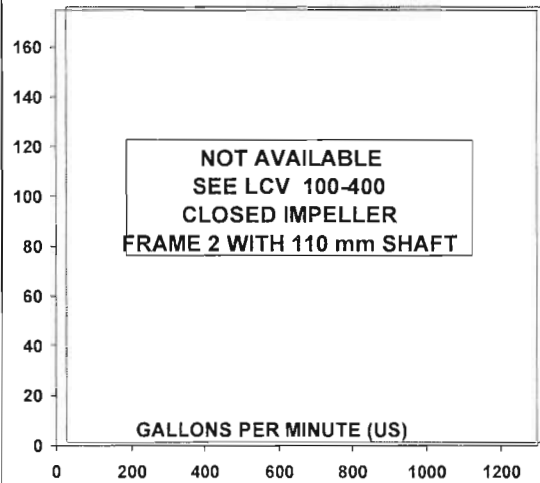
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

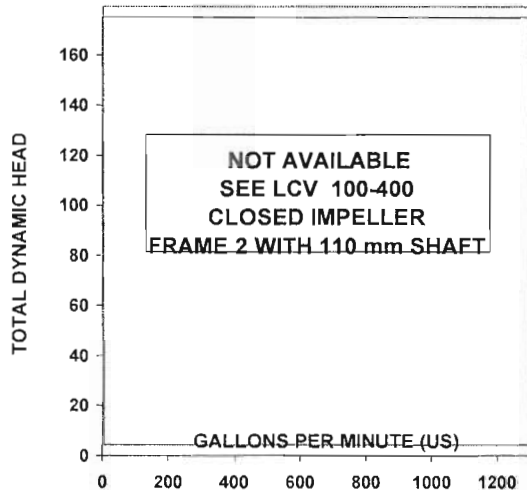


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

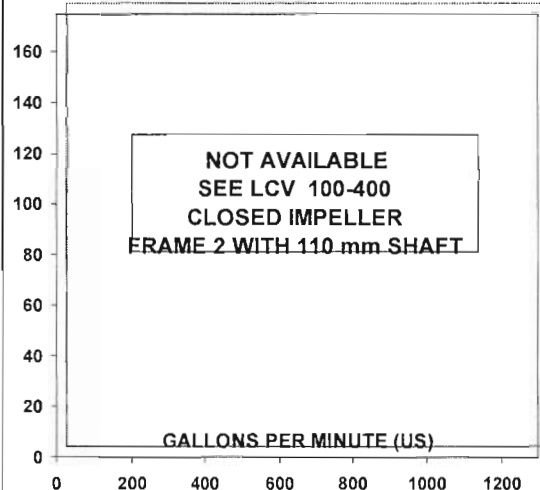
**900mm CANTILEVER LENGTH**



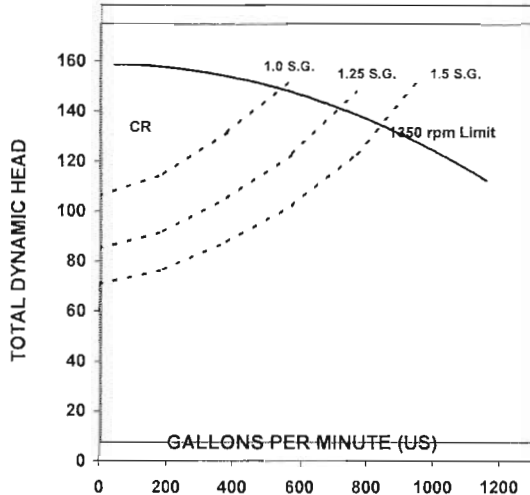
**1200mm CANTILEVER LENGTH**



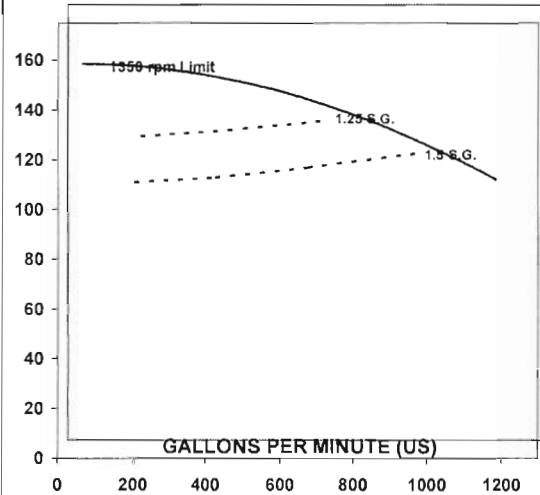
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



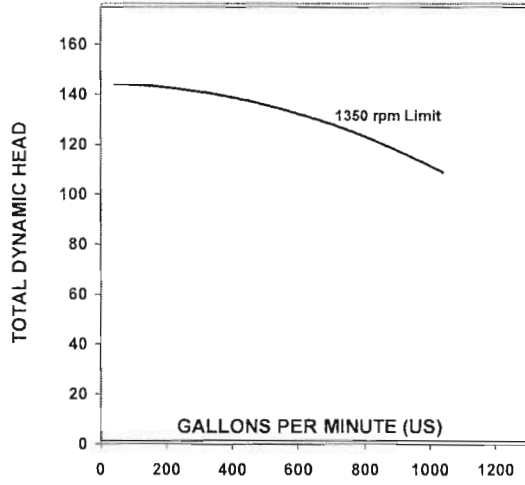
**1500mm CANTILEVER LENGTH**



**LCV 100-400 OPEN IMPELLER (Frame 2 with 110mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1350rpm**

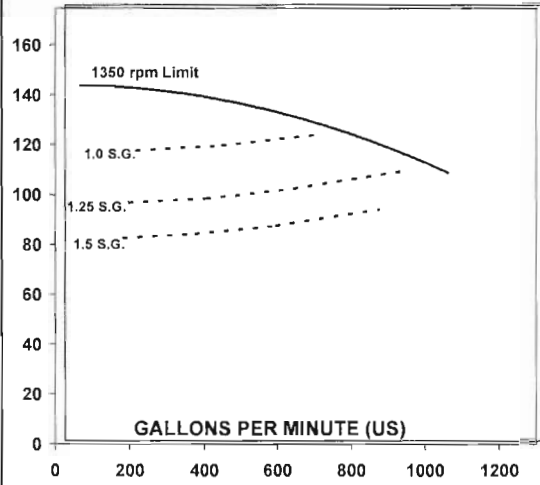
**DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.**

**900mm CANTILEVER LENGTH**

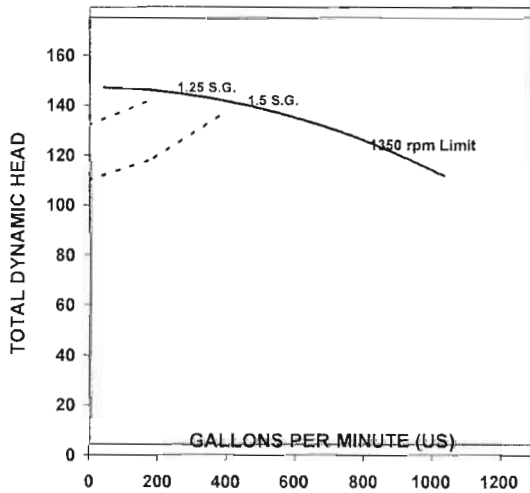


**BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.**

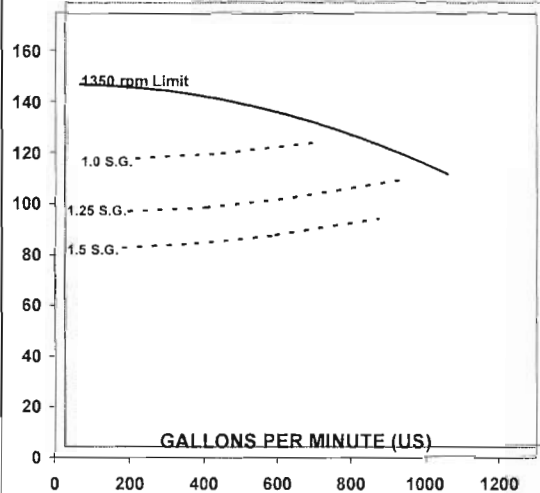
**900mm CANTILEVER LENGTH**



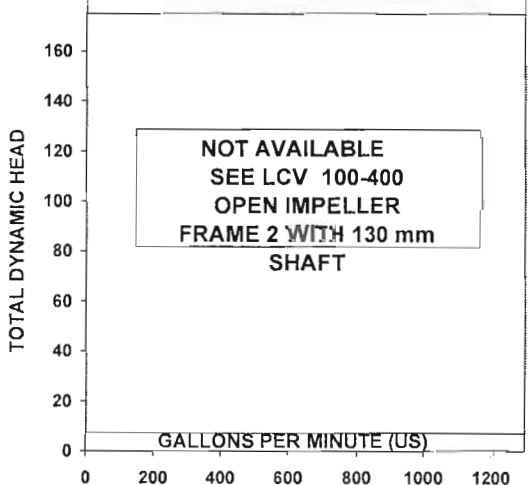
**1200mm CANTILEVER LENGTH**



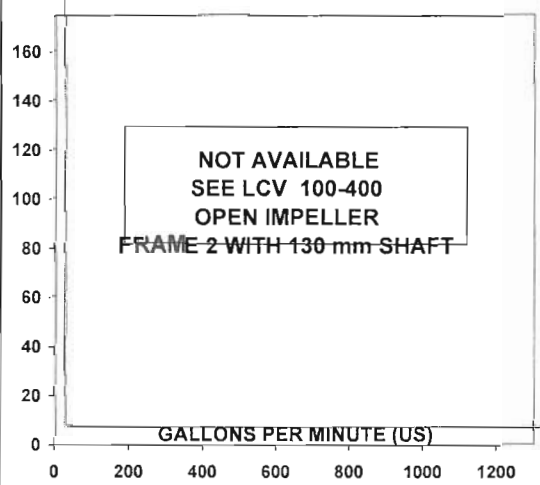
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



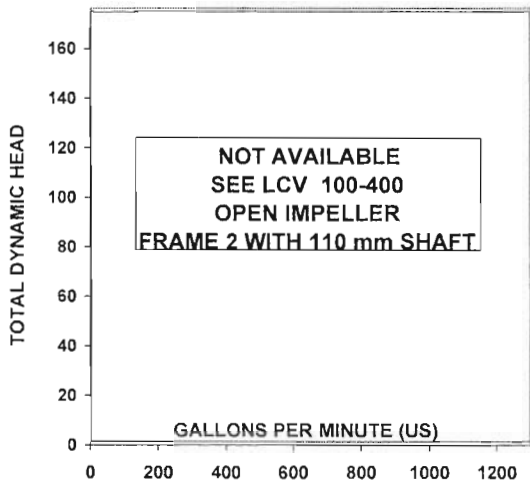
**1500mm CANTILEVER LENGTH**



**LCV 100-400 OPEN IMPELLER (Frame 2 with 130mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1350rpm**

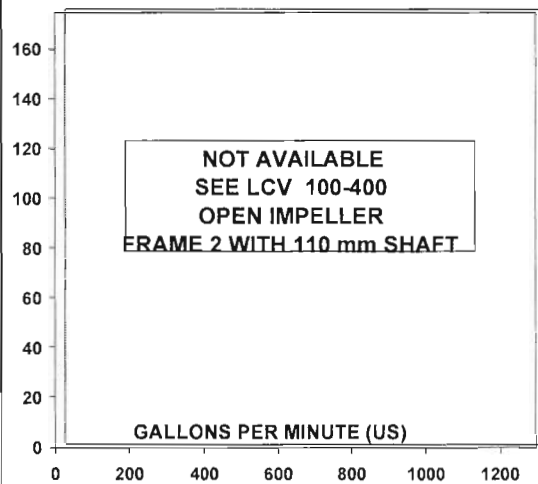
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**900mm CANTILEVER LENGTH**

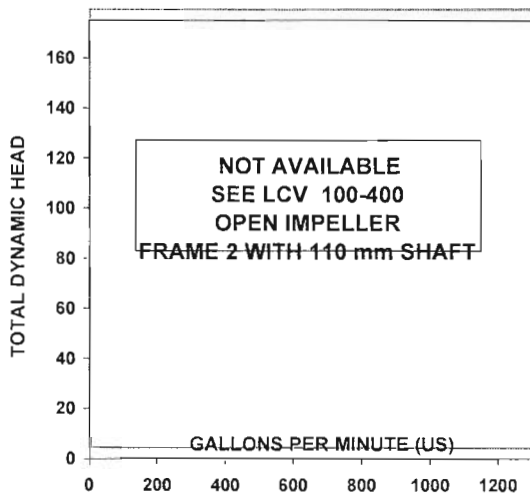


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

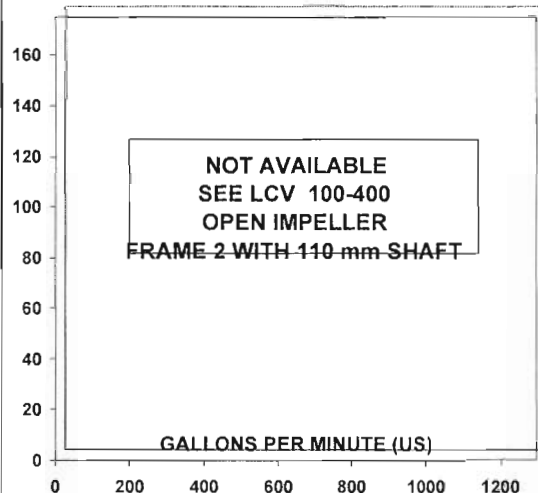
**900mm CANTILEVER LENGTH**



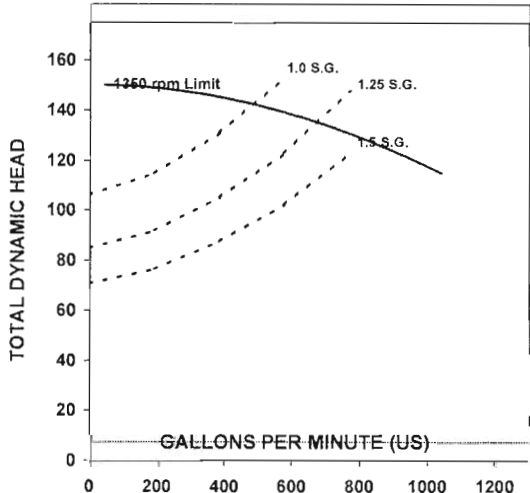
**1200mm CANTILEVER LENGTH**



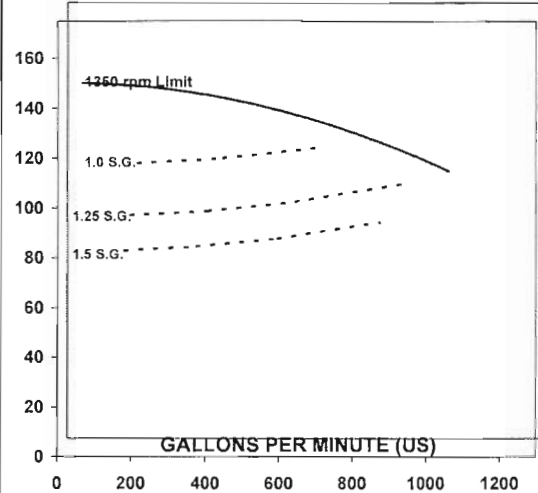
**1200mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**



**1500mm CANTILEVER LENGTH**

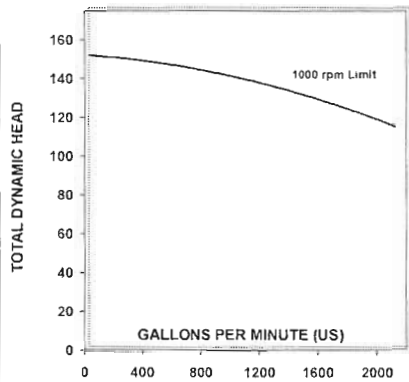




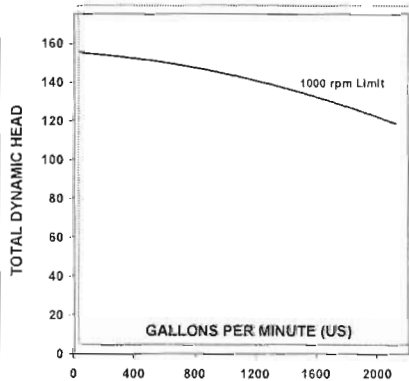
LCV 150-500 CLOSED IMPELLER (Frame 3 with 150mm Diameter Shaft)  
DO NOT OPERATE ABOVE 1000rpm

DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

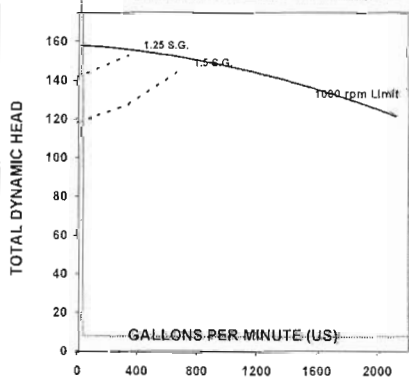
1200mm CANTILEVER LENGTH



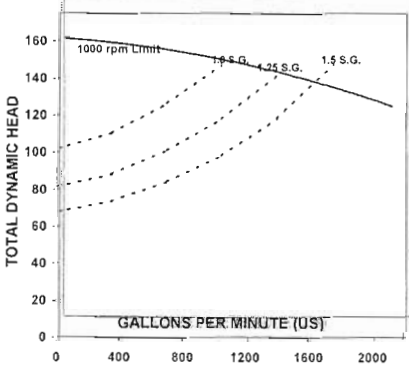
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH

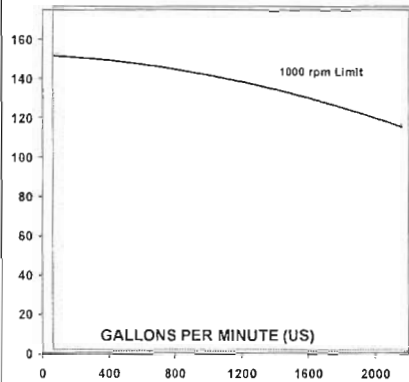


2100mm CANTILEVER LENGTH

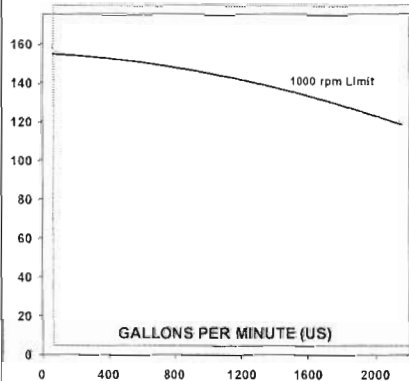


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

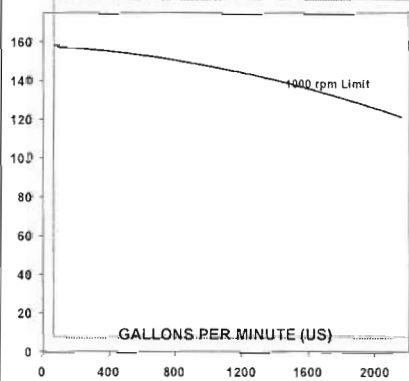
1200mm CANTILEVER LENGTH



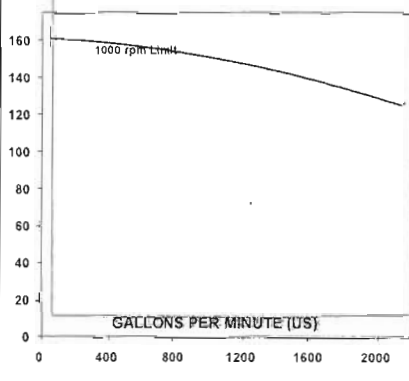
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH



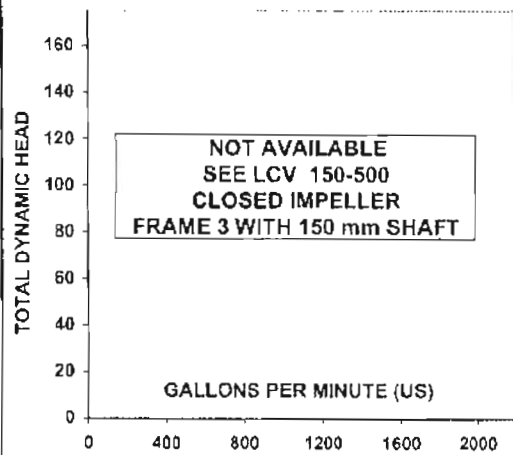
2100mm CANTILEVER LENGTH



**LCV 150-500 CLOSED IMPELLER (Frame 3 with 170mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1000rpm**

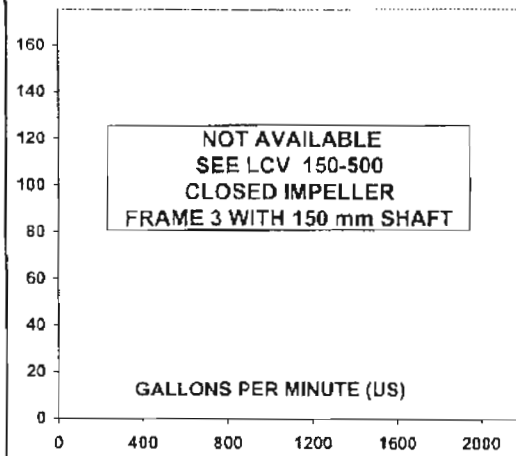
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**1500mm CANTILEVER LENGTH**

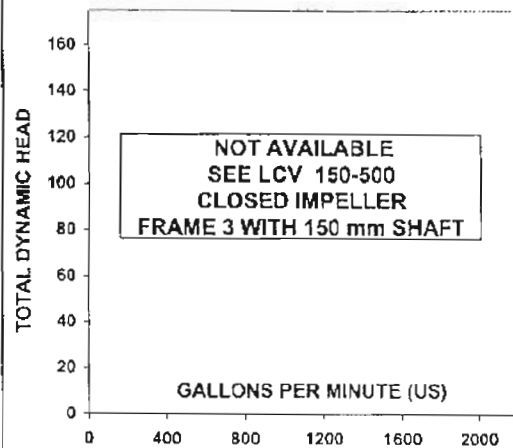


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

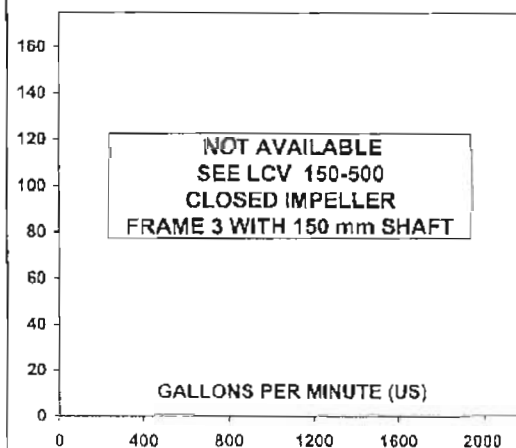
**1500mm CANTILEVER LENGTH**



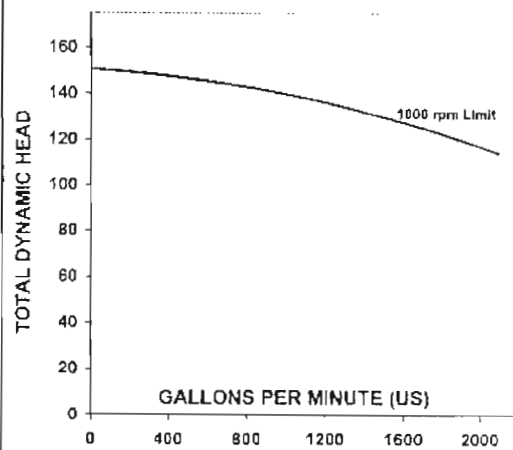
**1800mm CANTILEVER LENGTH**



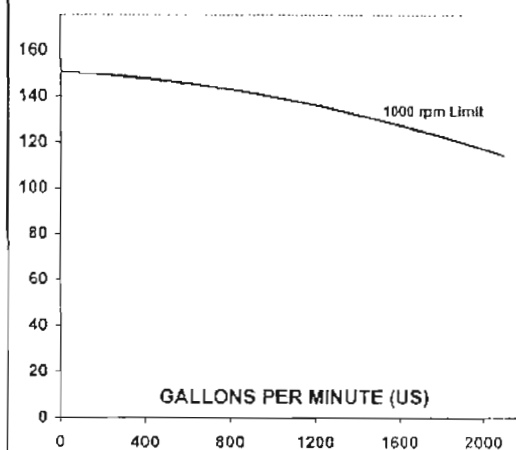
**1800mm CANTILEVER LENGTH**



**2100mm CANTILEVER LENGTH**



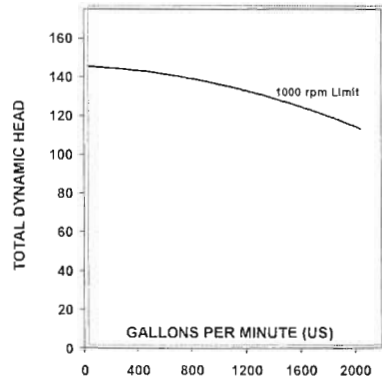
**2100mm CANTILEVER LENGTH**



LCV 150-500 OPEN IMPELLER (Frame 3 with 150mm Diameter Shaft)  
DO NOT OPERATE ABOVE 1000rpm

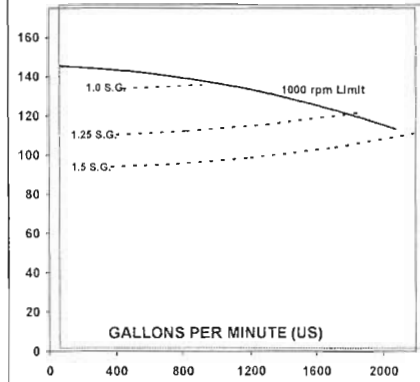
DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

1200mm CANTILEVER LENGTH

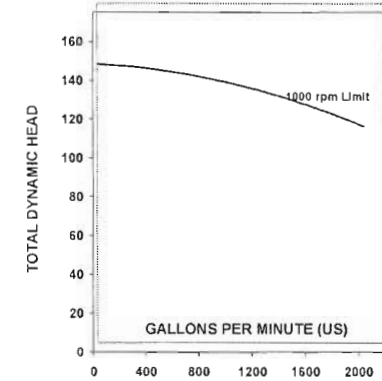


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

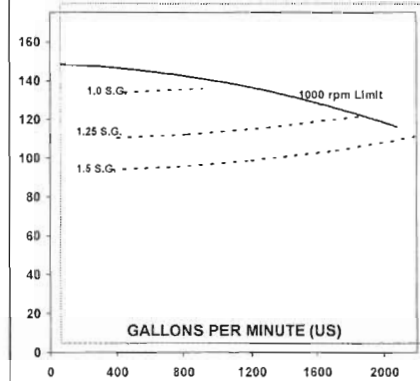
1200mm CANTILEVER LENGTH



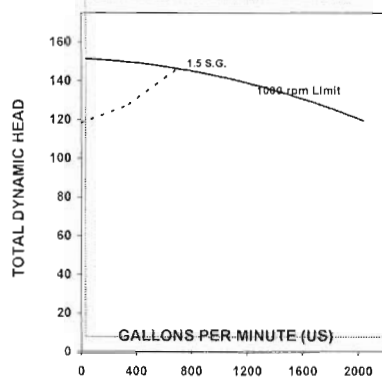
1500mm CANTILEVER LENGTH



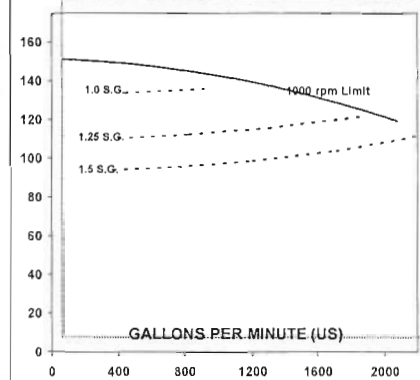
1500mm CANTILEVER LENGTH



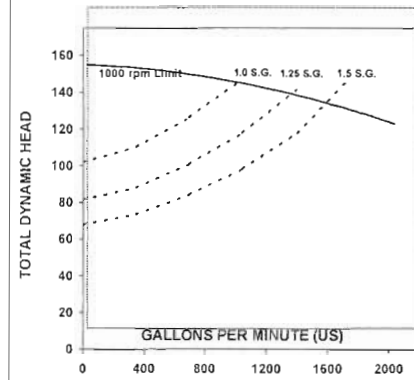
1800mm CANTILEVER LENGTH



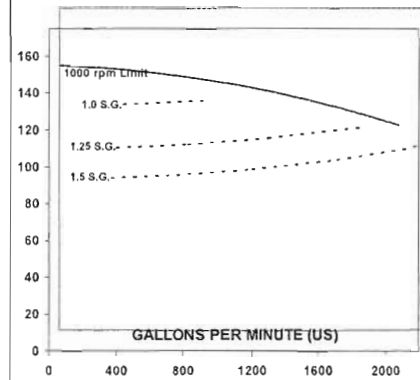
1800mm CANTILEVER LENGTH



2100mm CANTILEVER LENGTH



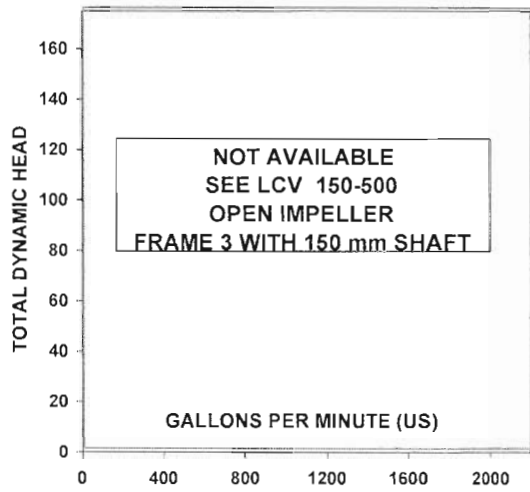
2100mm CANTILEVER LENGTH



**LCV 150-500 OPEN IMPELLER (Frame 3 with 170mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 1000rpm**

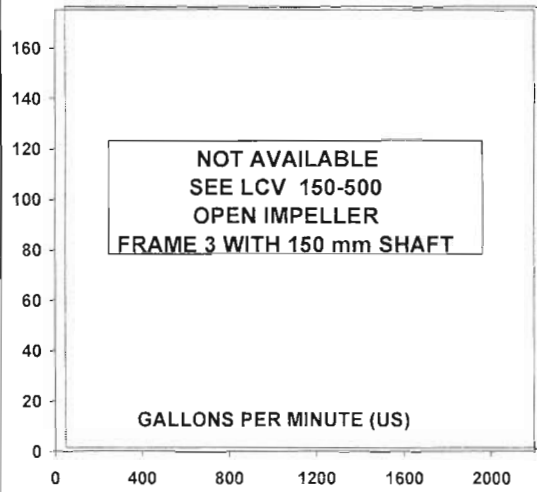
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**1500mm CANTILEVER LENGTH**

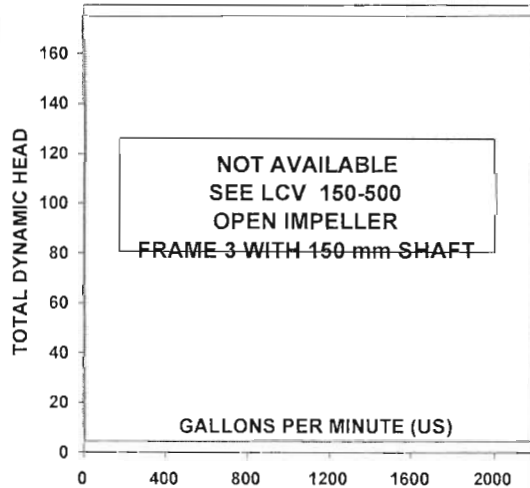


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

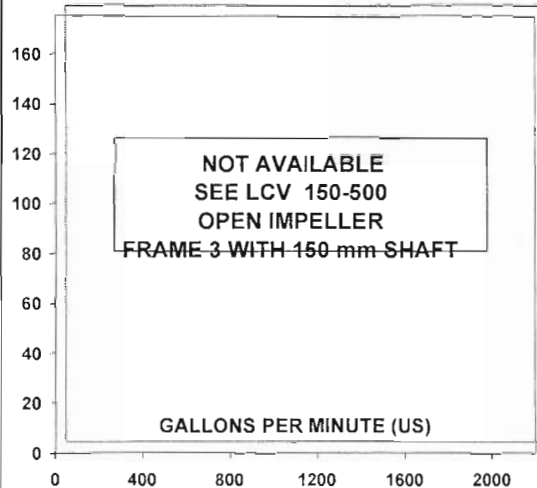
**1500mm CANTILEVER LENGTH**



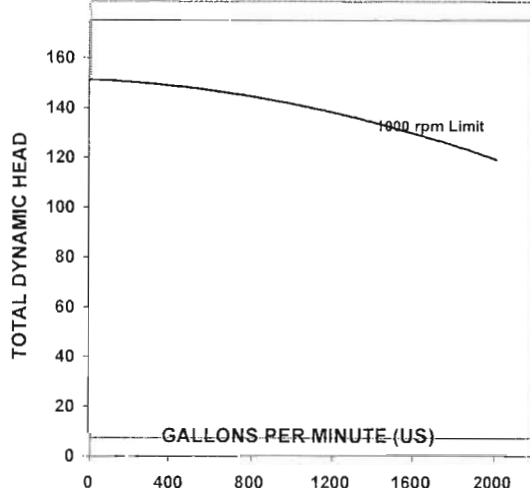
**1800mm CANTILEVER LENGTH**



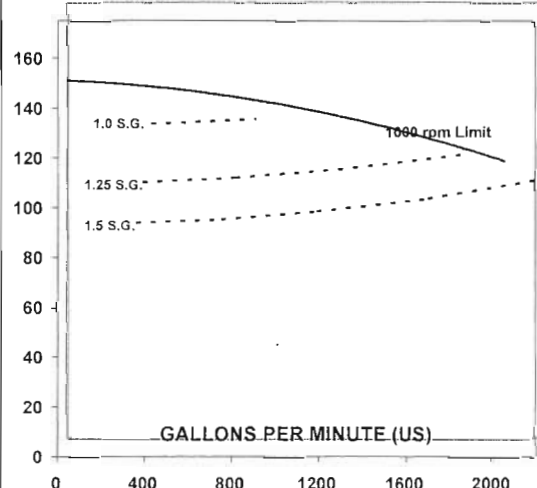
**1800mm CANTILEVER LENGTH**



**2100mm CANTILEVER LENGTH**



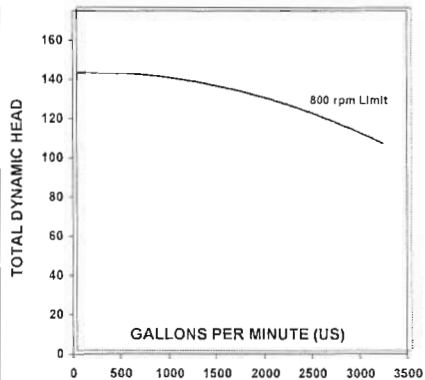
**2100mm CANTILEVER LENGTH**



LCV 200-610 CLOSED IMPELLER (Frame 3 with 150mm Diameter Shaft)  
DO NOT OPERATE ABOVE 800rpm

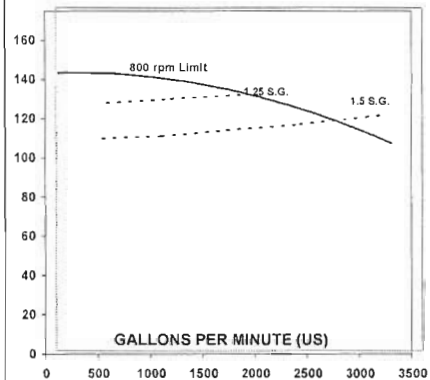
DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

1200mm CANTILEVER LENGTH

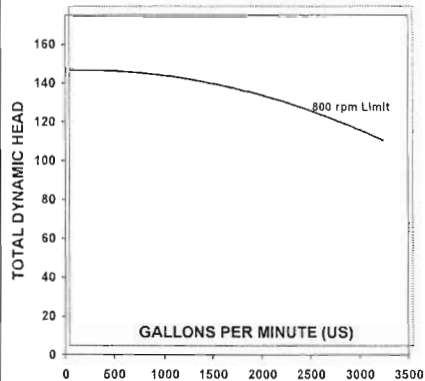


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

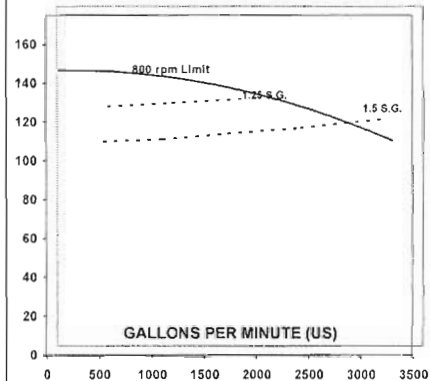
1200mm CANTILEVER LENGTH



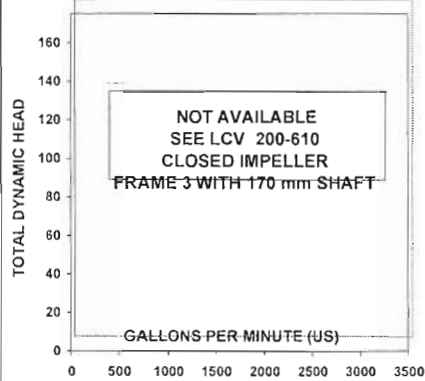
1500mm CANTILEVER LENGTH



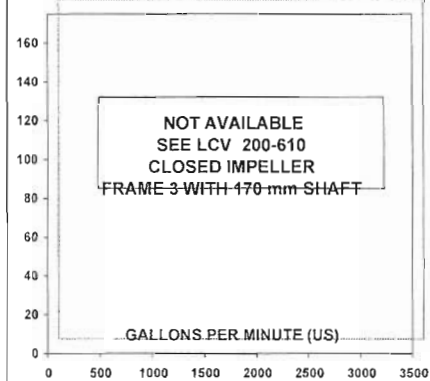
1500mm CANTILEVER LENGTH



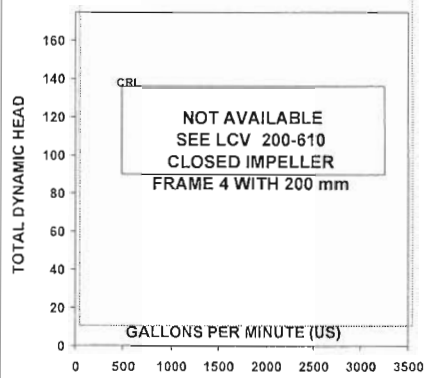
1800mm CANTILEVER LENGTH



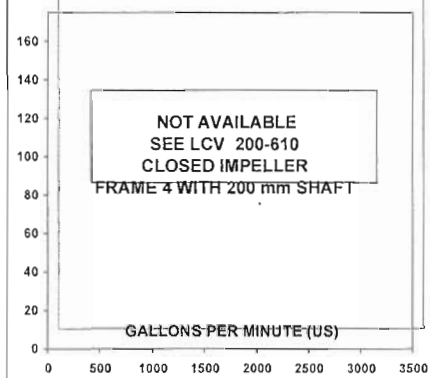
1800mm CANTILEVER LENGTH



2100mm CANTILEVER LENGTH

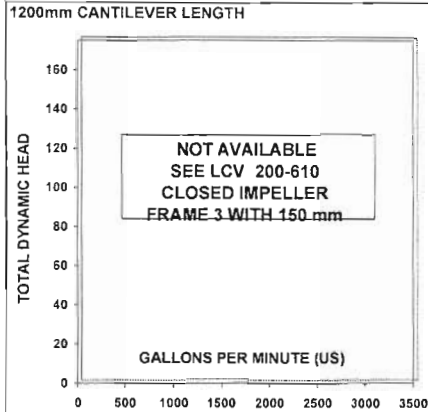


2100mm CANTILEVER LENGTH

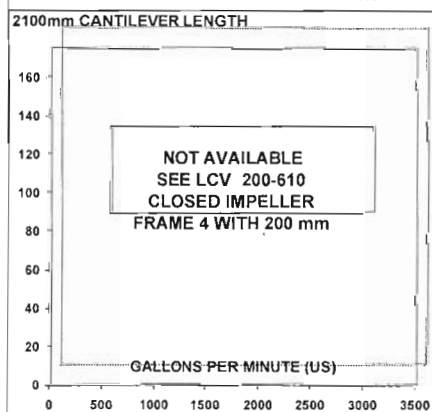
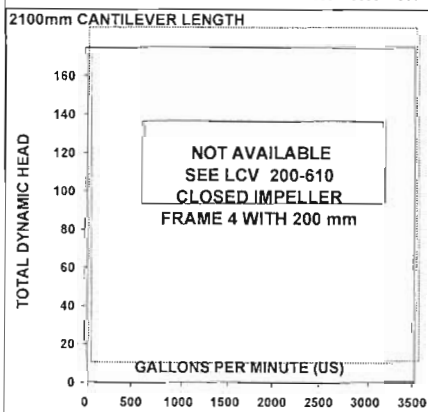
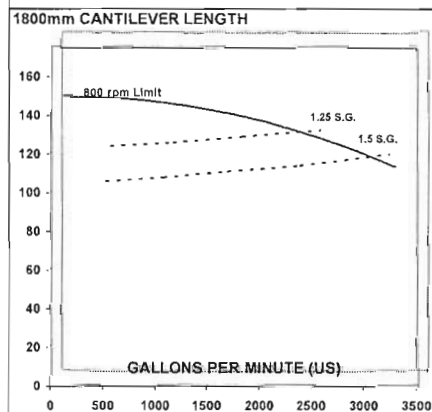
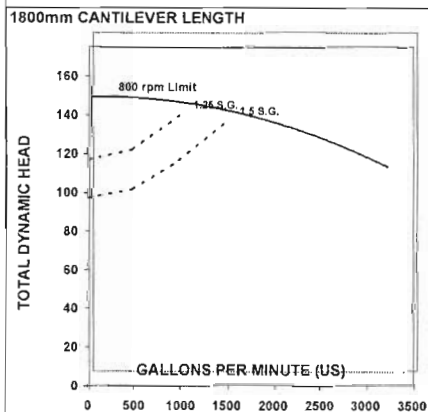
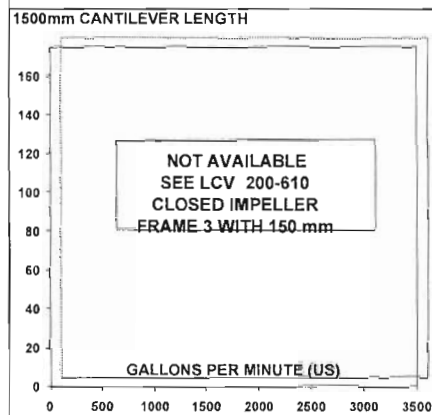
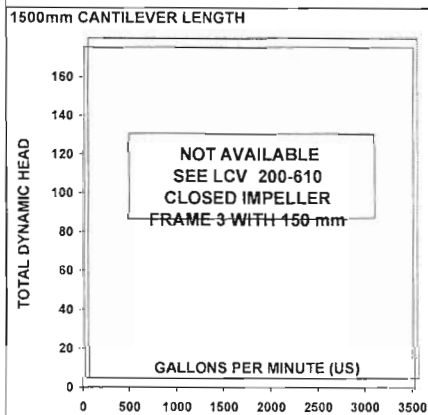
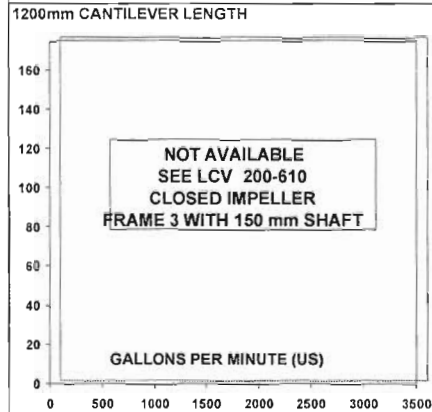


**LCV 200-610 CLOSED IMPELLER (Frame 3 with 170mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 800rpm**

**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.



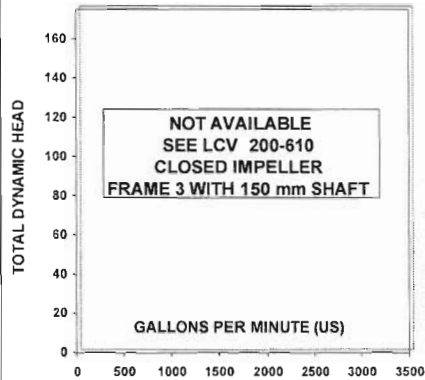
**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.



**LCV 200-610 CLOSED IMPELLER (Frame 4 with 200mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 800rpm**

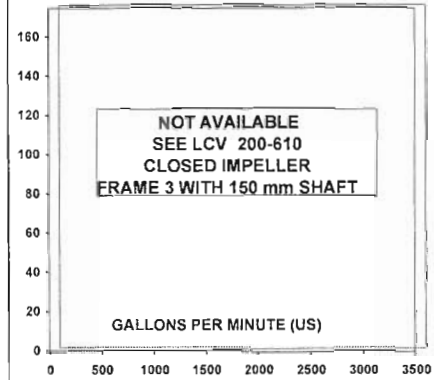
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**1200mm CANTILEVER LENGTH**

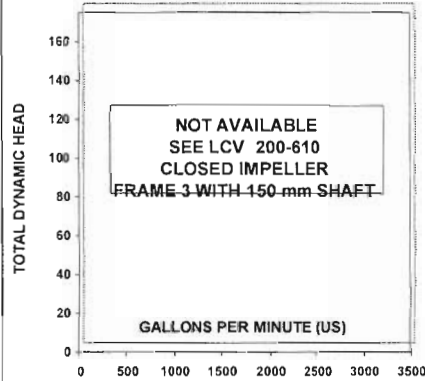


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

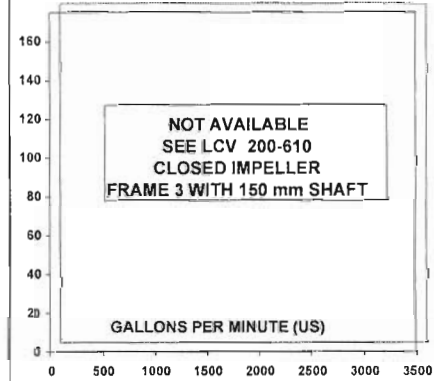
**1200mm CANTILEVER LENGTH**



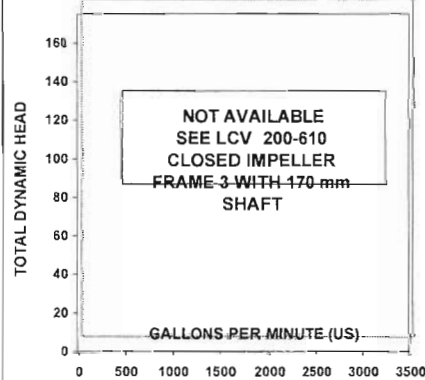
**1500mm CANTILEVER LENGTH**



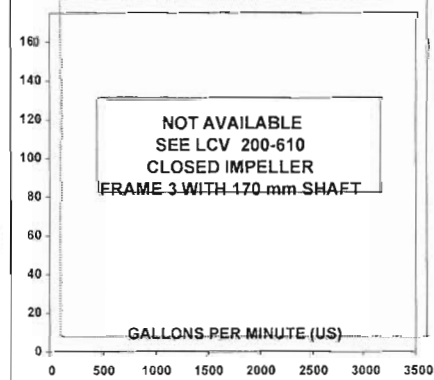
**1500mm CANTILEVER LENGTH**



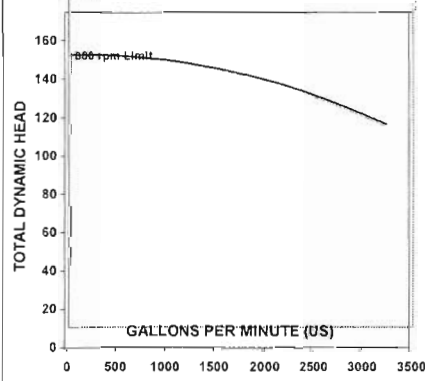
**1800mm CANTILEVER LENGTH**



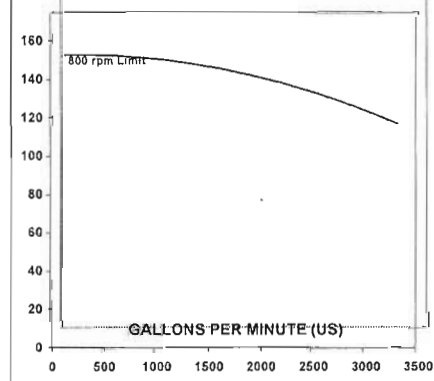
**1800mm CANTILEVER LENGTH**



**2100mm CANTILEVER LENGTH**



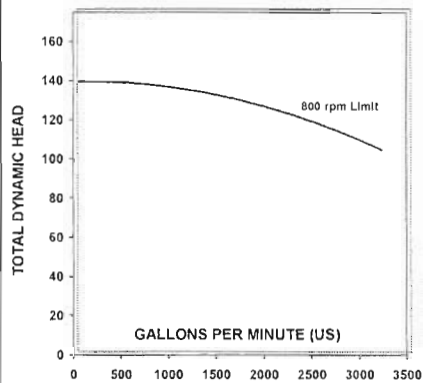
**2100mm CANTILEVER LENGTH**



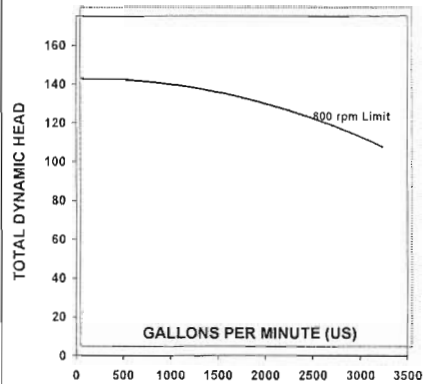
LCV 200-610 OPEN IMPELLER (Frame 3 with 150mm Diameter Shaft)  
DO NOT OPERATE ABOVE 800rpm

DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

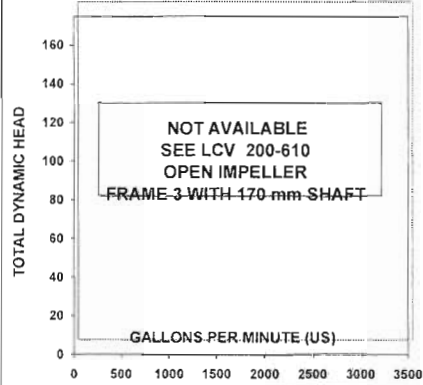
1200mm CANTILEVER LENGTH



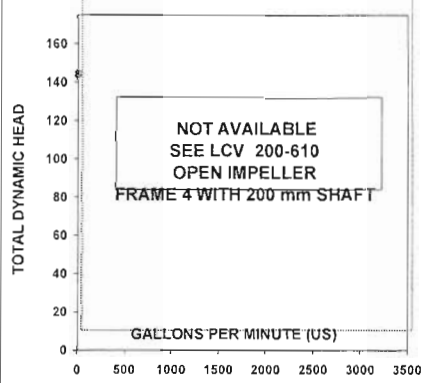
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH

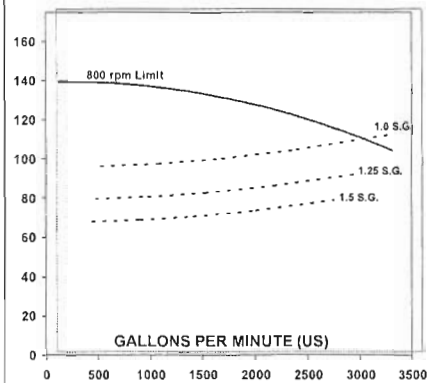


2100mm CANTILEVER LENGTH

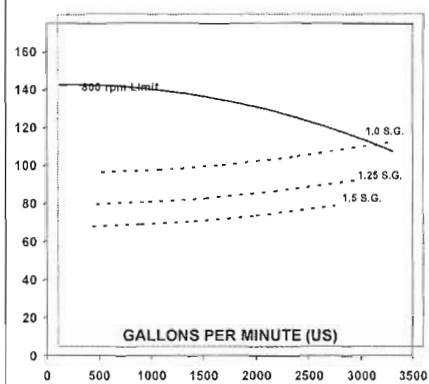


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

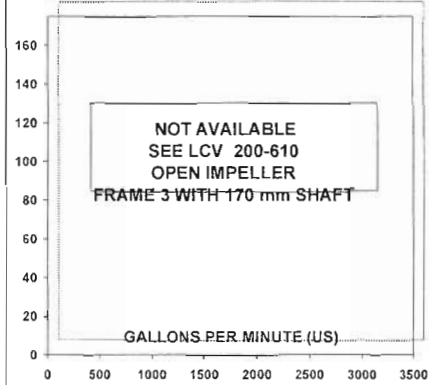
1200mm CANTILEVER LENGTH



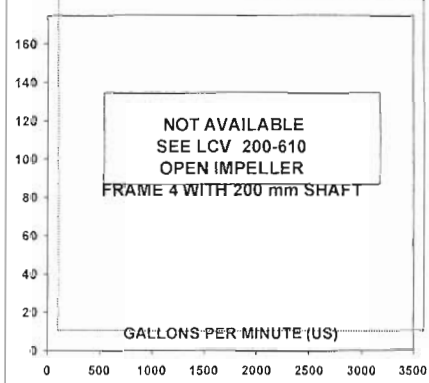
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH



2100mm CANTILEVER LENGTH

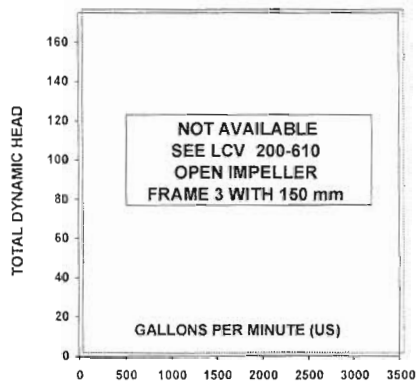




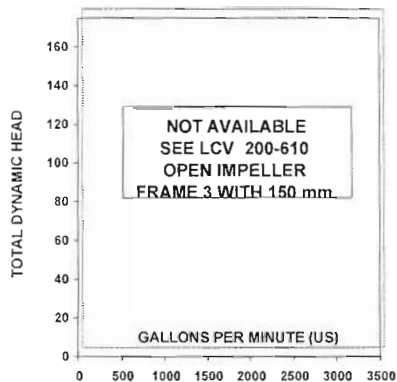
LCV 200-610 OPEN IMPELLER (Frame 3 with 170mm Diameter Shaft)  
DO NOT OPERATE ABOVE 800rpm

DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

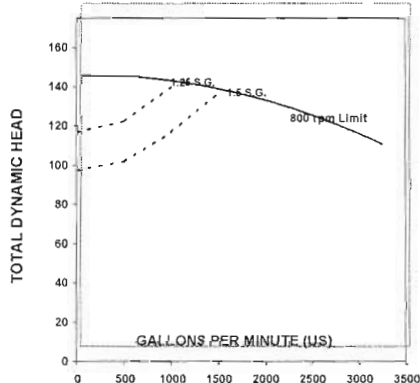
1200mm CANTILEVER LENGTH



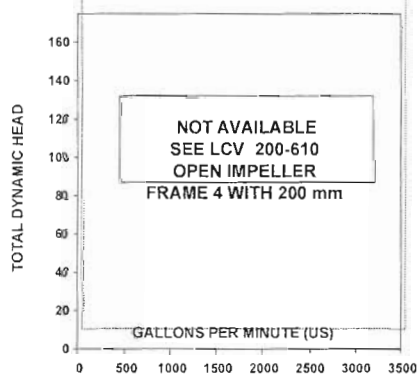
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH

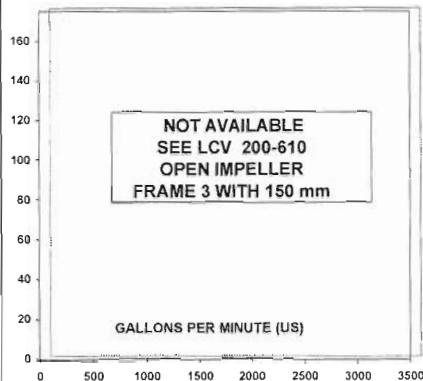


2100mm CANTILEVER LENGTH

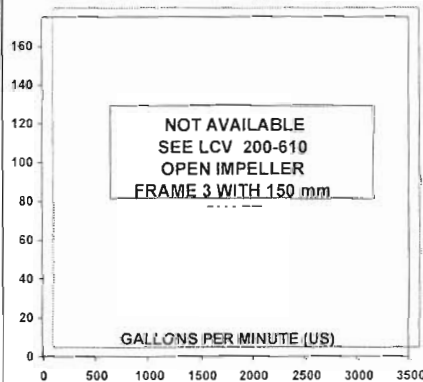


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

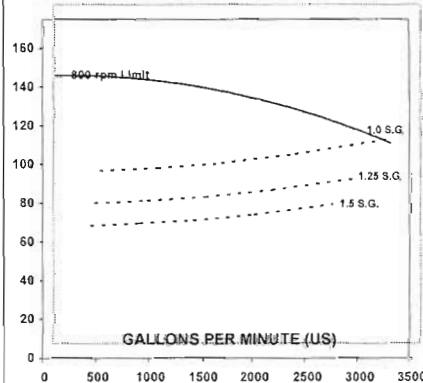
1200mm CANTILEVER LENGTH



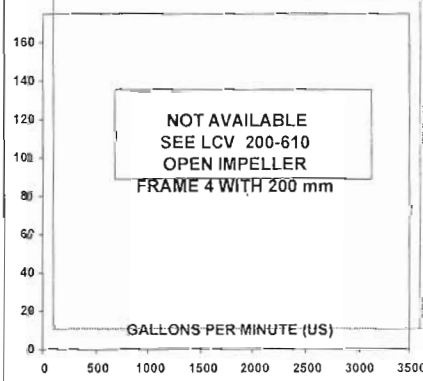
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH

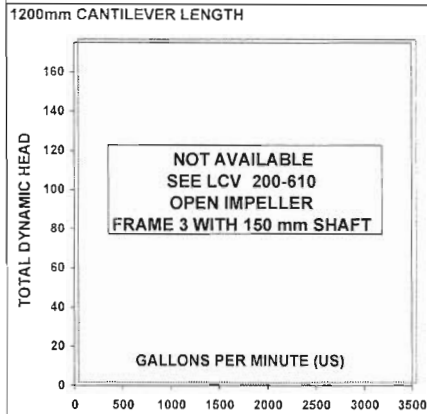


2100mm CANTILEVER LENGTH

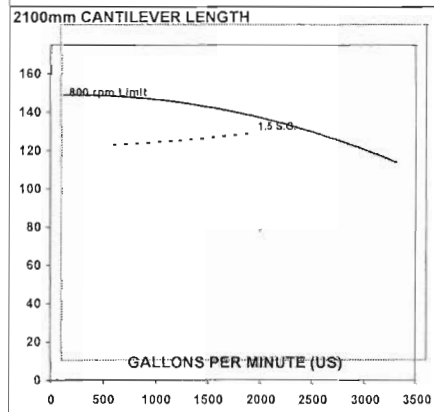
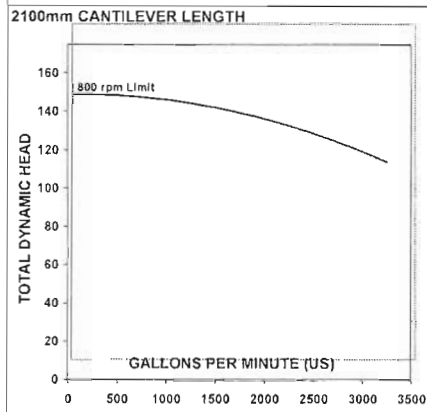
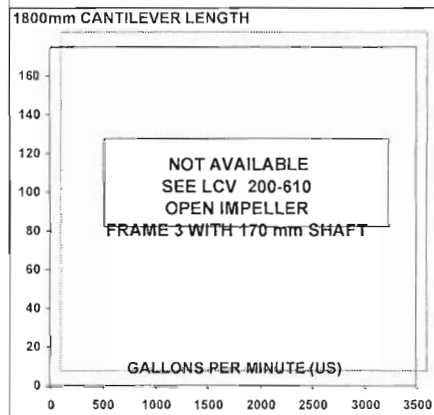
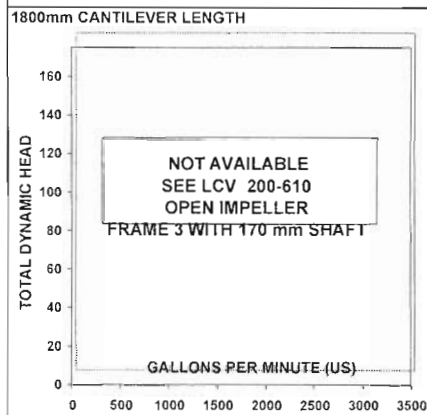
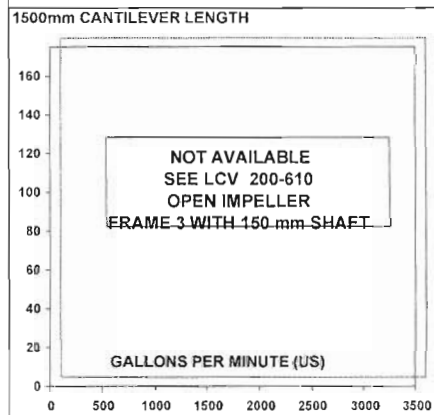
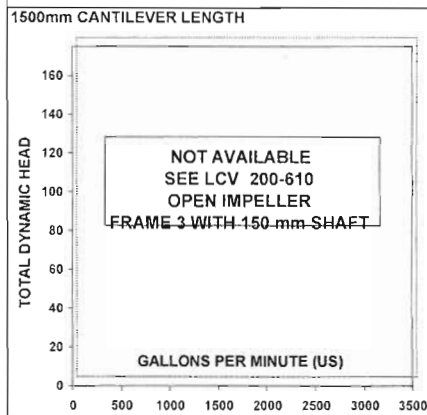
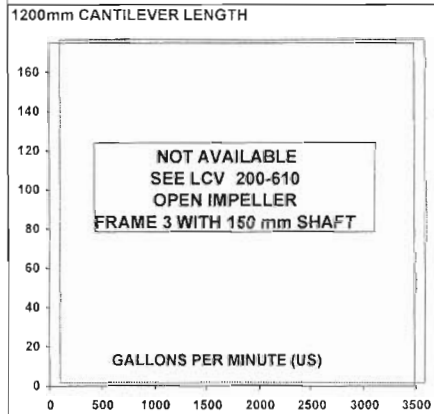


LCV 200-610 OPEN IMPELLER (Frame 4 with 200mm Diameter Shaft)  
DO NOT OPERATE ABOVE 800rpm

DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.



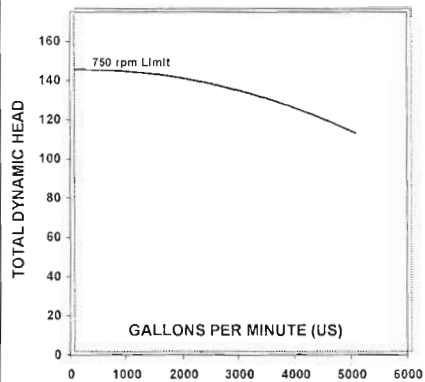
BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.



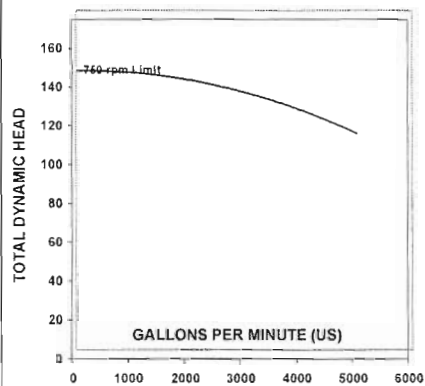
LCV 250-660 CLOSED IMPELLER (Frame 4 with 200mm Diameter Shaft)  
DO NOT OPERATE ABOVE 750rpm

DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

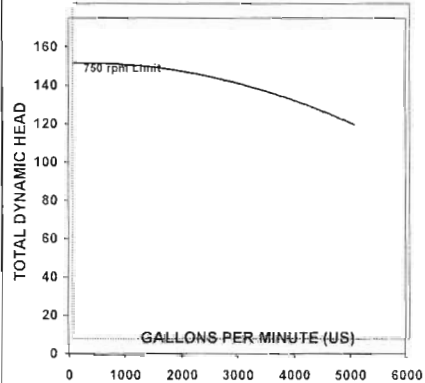
1200mm CANTILEVER LENGTH



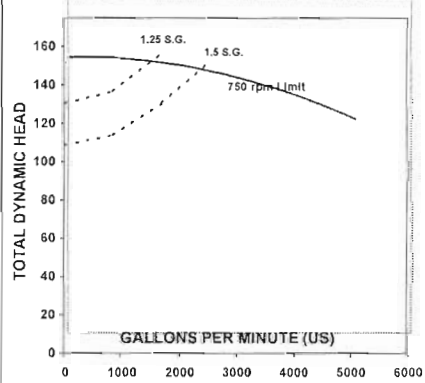
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH

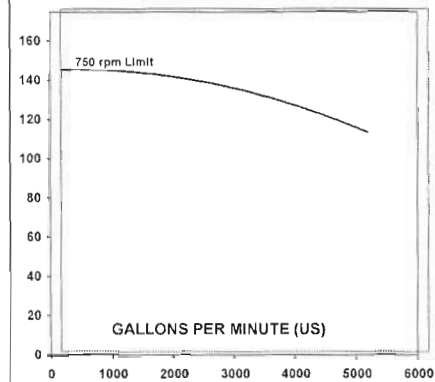


2100mm CANTILEVER LENGTH

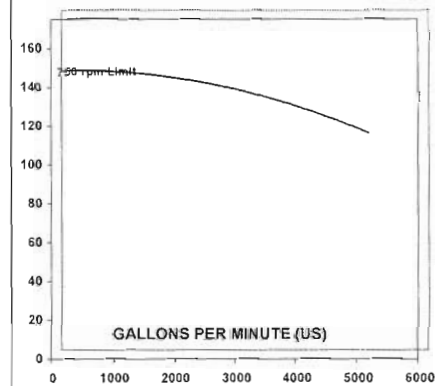


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

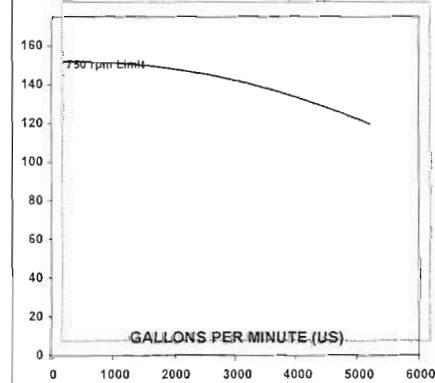
1200mm CANTILEVER LENGTH



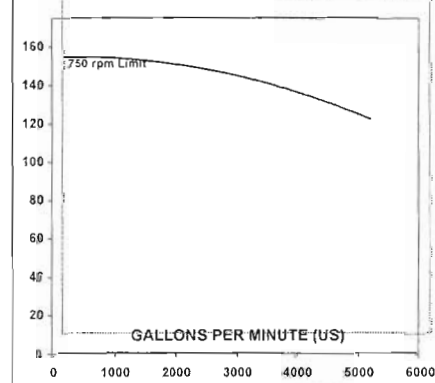
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH



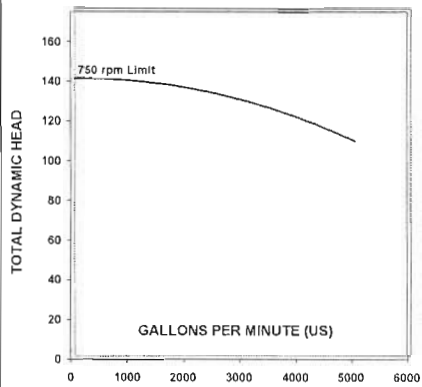
2100mm CANTILEVER LENGTH



LCV 250-660 OPEN IMPELLER (Frame 4 with 200mm Diameter Shaft)  
DO NOT OPERATE ABOVE 750rpm

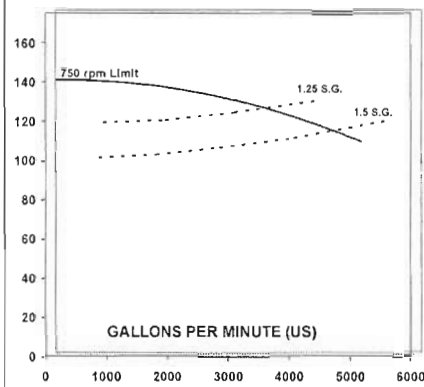
DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

1200mm CANTILEVER LENGTH

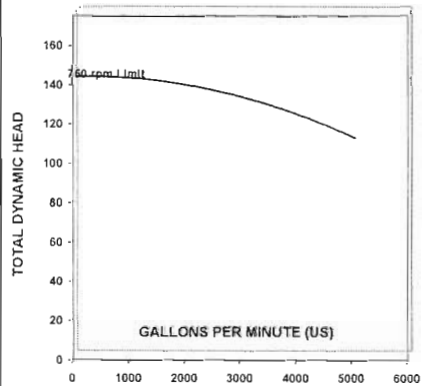


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

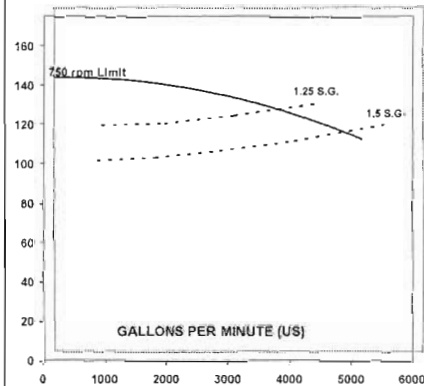
1200mm CANTILEVER LENGTH



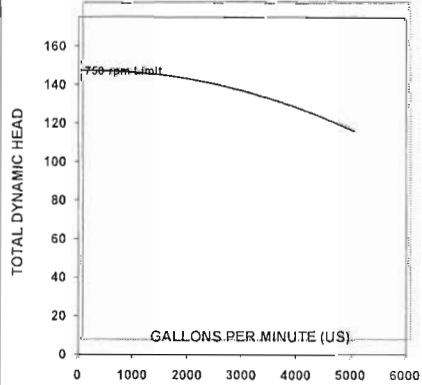
1500mm CANTILEVER LENGTH



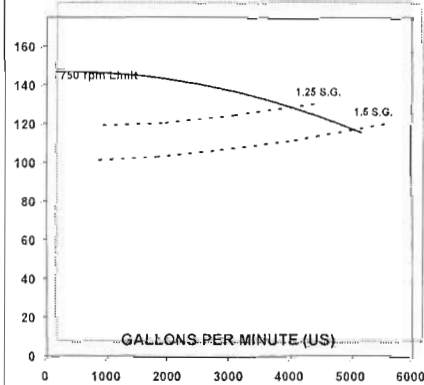
1500mm CANTILEVER LENGTH



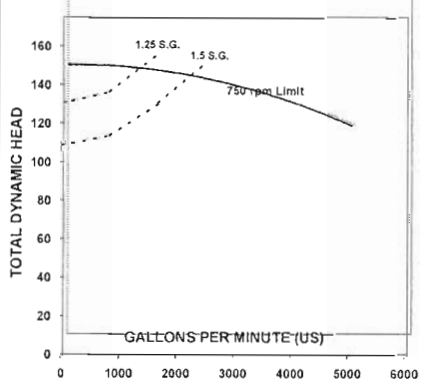
1800mm CANTILEVER LENGTH



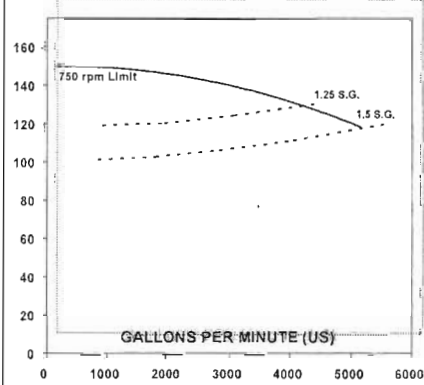
1800mm CANTILEVER LENGTH



2100mm CANTILEVER LENGTH



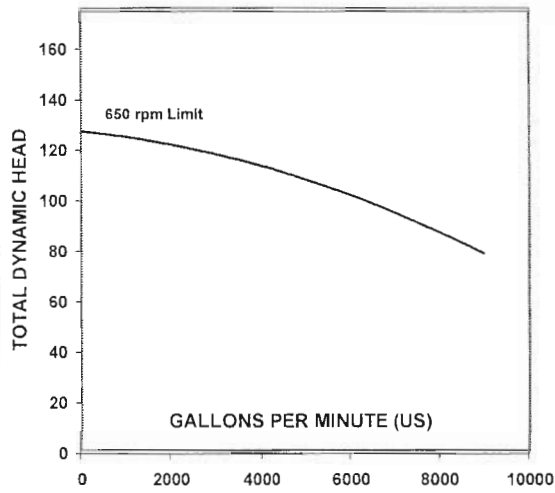
2100mm CANTILEVER LENGTH



LCV 300-710 CLOSED IMPELLER (Frame 4 with 200mm Diameter Shaft)  
DO NOT OPERATE ABOVE 650rpm

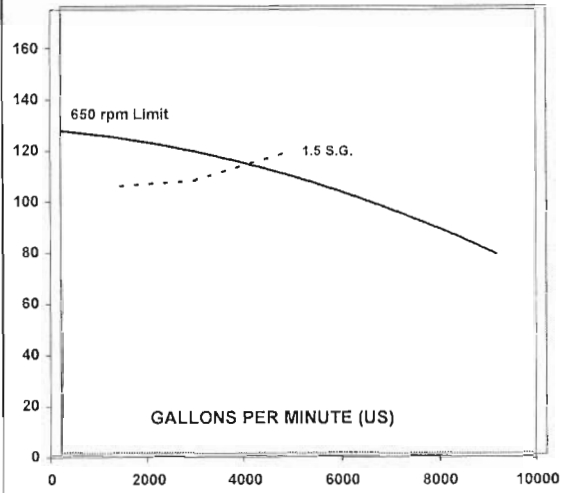
DEFLECTION - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

1200mm CANTILEVER LENGTH

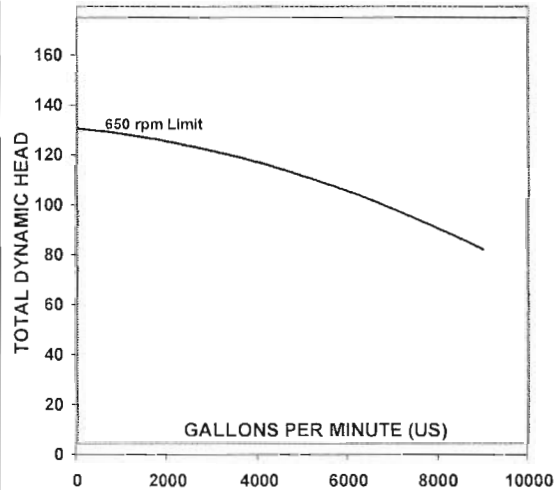


BEARING LIFE - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

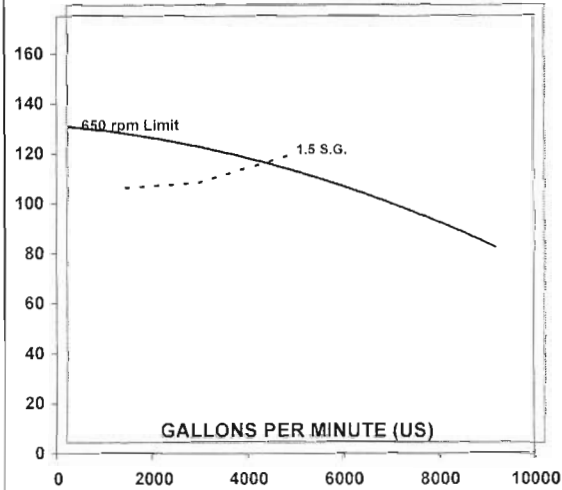
1200mm CANTILEVER LENGTH



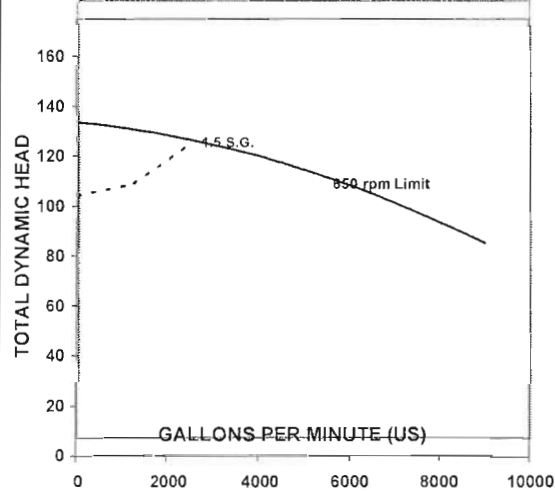
1500mm CANTILEVER LENGTH



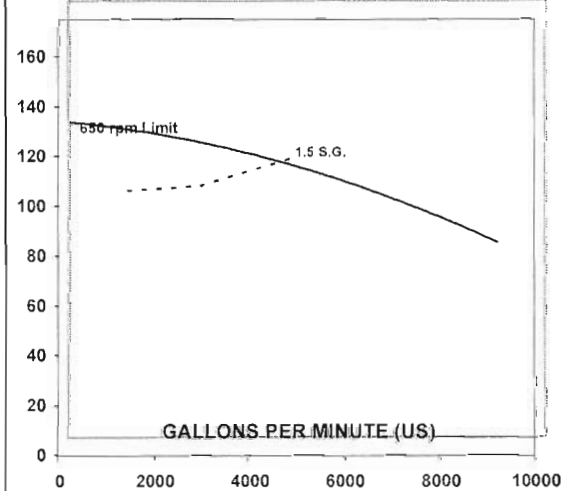
1500mm CANTILEVER LENGTH



1800mm CANTILEVER LENGTH



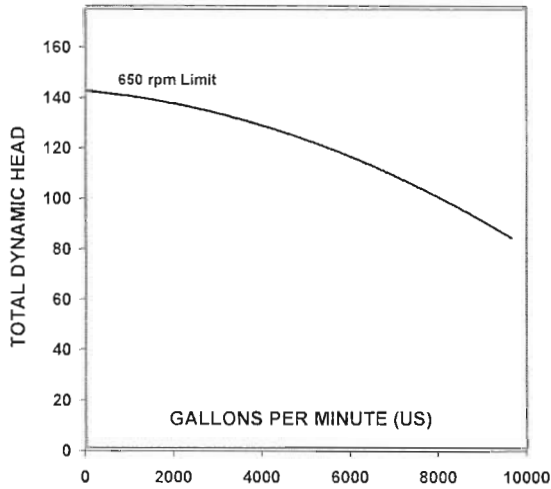
1800mm CANTILEVER LENGTH



**LCV 300-710 OPEN IMPELLER (Frame 4 with 200mm Diameter Shaft)**  
**DO NOT OPERATE ABOVE 650rpm**

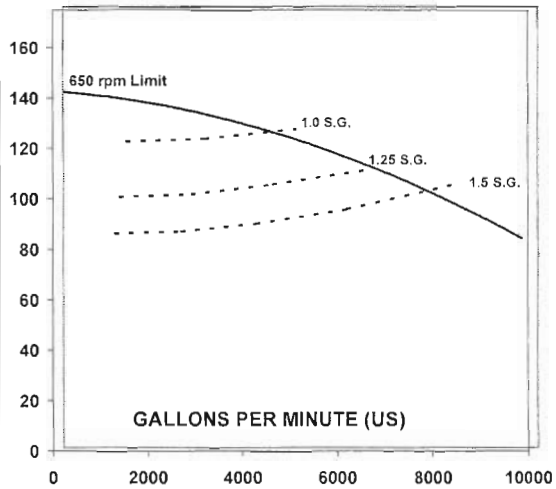
**DEFLECTION** - Below for each cantilever length are shaft deflection limitations for selected specific gravities. See Appendix A for interpretation.

**1200mm CANTILEVER LENGTH**

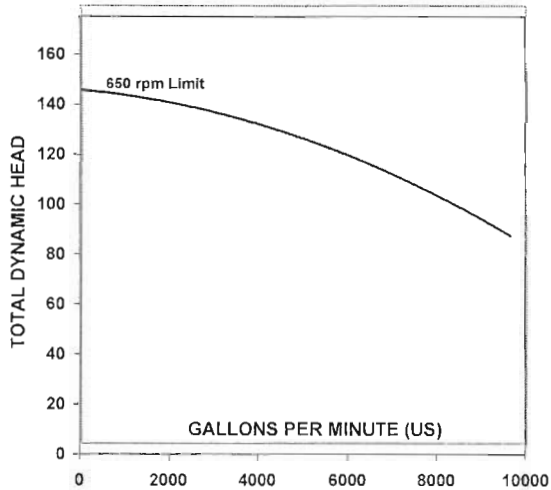


**BEARING LIFE** - Below for each cantilever length are bearing life limitations for selected specific gravities. See Appendix A for interpretation.

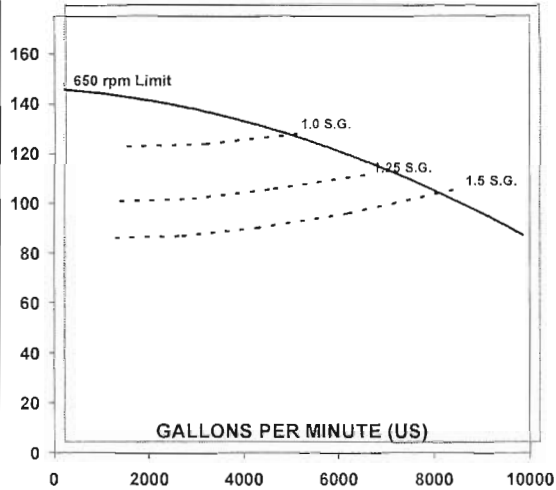
**1200mm CANTILEVER LENGTH**



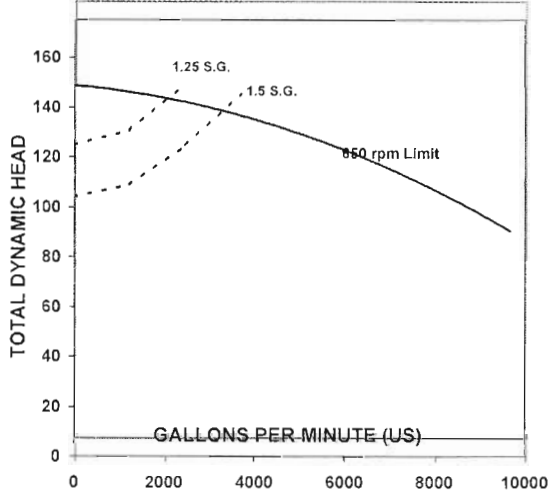
**1500mm CANTILEVER LENGTH**



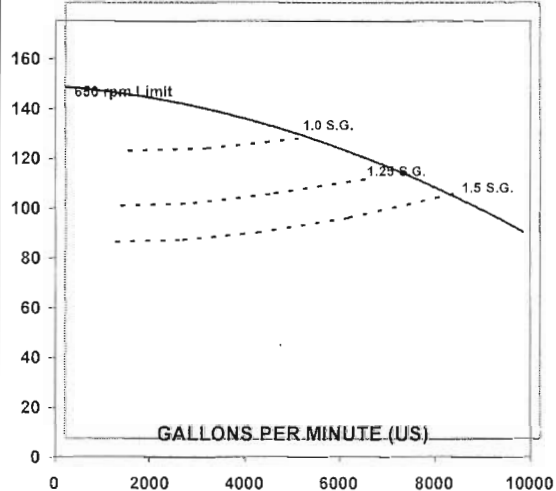
**1500mm CANTILEVER LENGTH**



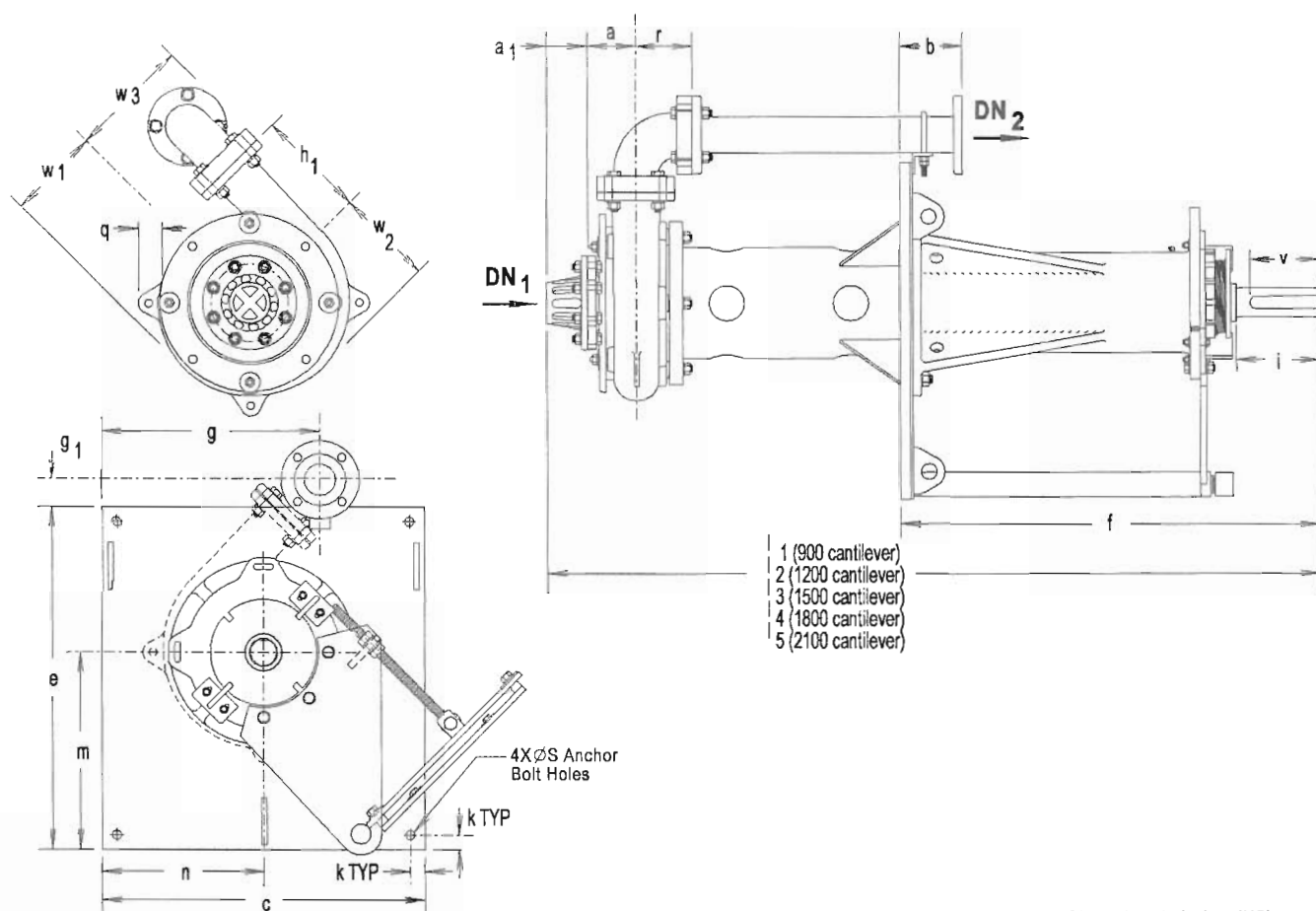
**1800mm CANTILEVER LENGTH**



**1800mm CANTILEVER LENGTH**



## 9.1 LCV M Pump Assembly, U.S. Dimensions



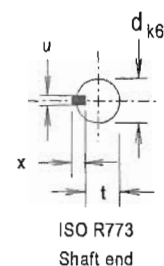
**Pump Dimensions**

Dimensions in inches (US)  
[Shaft in mm]

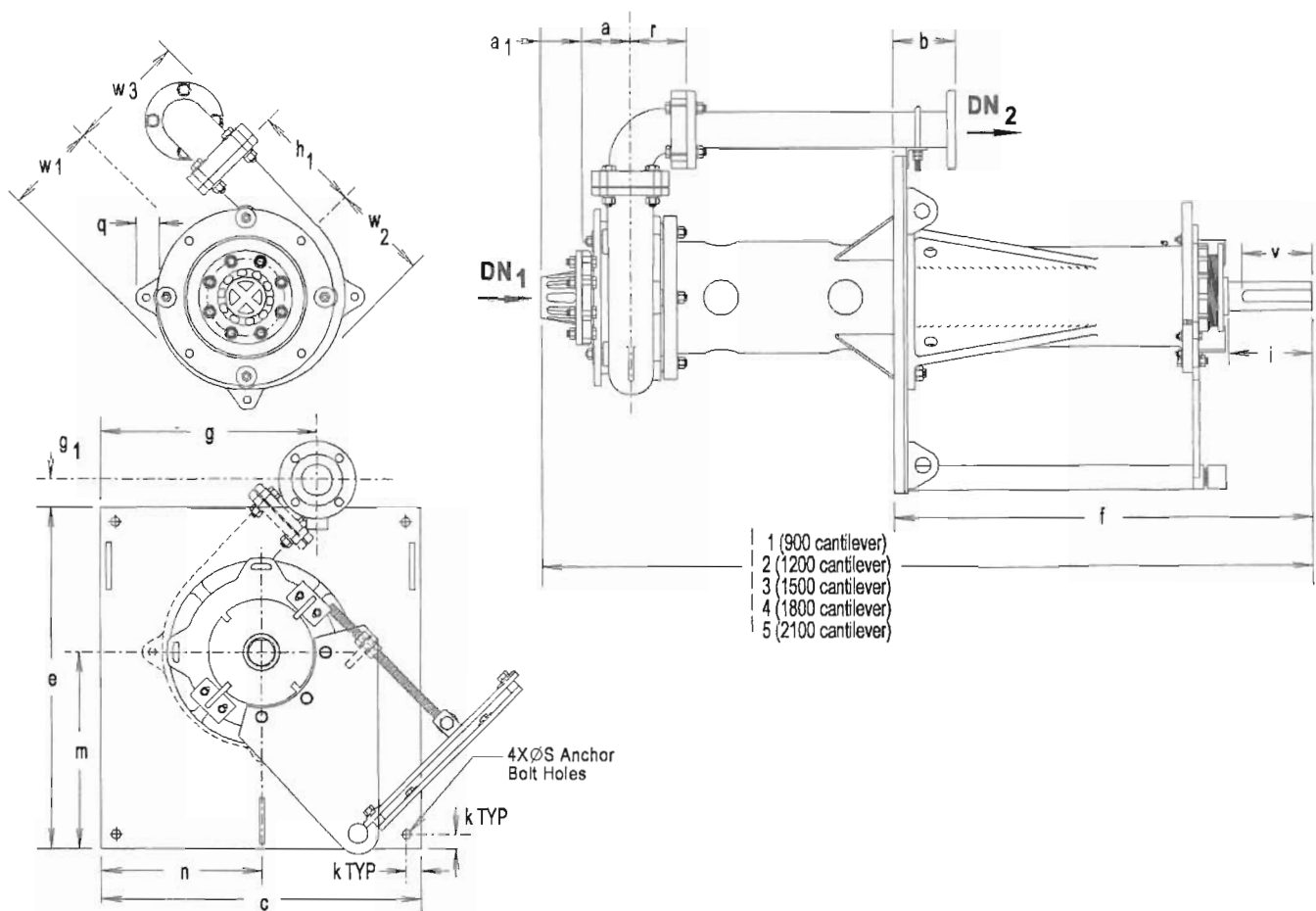
Pump and Frame Size	Shaft Sizes	Pump DN <sub>1</sub>	Pump DN <sub>2</sub>	a	a <sub>1</sub>	b	f	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	r	h <sub>1</sub>	w <sub>1</sub> (ref.)	w <sub>2</sub> (ref.)	w <sub>3</sub> (ref.)	q (ref.)
LCV 50-230 1	3.54	3	2	4.53	2.95	6.14	33.90	67.80	79.61	—	—	—	4.49	9.06	6.69	6.89	8.66	1.57
LCV 50-230 1	4.33	3	2	4.53	2.95	6.14	33.90	—	—	91.42	—	—	4.49	9.06	6.69	6.89	8.66	1.57
LCV 80-300 2	4.33	4	3	4.72	3.94	6.14	39.57	75.04	86.85	—	—	—	5.51	10.63	8.86	9.45	11.61	1.89
LCV 80-300 2	5.12	4	3	4.72	3.94	6.14	39.57	—	—	98.66	—	—	5.51	10.63	8.86	9.45	11.61	1.89
LCV 100-400 2	4.33	6	4	5.31	4.88	6.14	39.57	77.05	88.86	—	—	—	6.50	12.80	11.22	11.81	14.37	2.20
LCV 100-400 2	5.12	6	4	5.31	4.88	6.14	39.57	—	—	100.67	—	—	6.50	12.80	11.22	11.81	14.37	2.20
LCV 150-500 3	5.90	8	6	6.89	5.91	6.42	47.87	—	92.76	104.57	116.38	—	7.99	16.14	14.17	14.76	17.72	2.64
LCV 150-500 3	6.70	8	6	6.89	5.91	6.42	47.87	—	—	—	128.19	—	7.99	16.14	14.17	14.76	17.72	2.64
LCV 200-610 3	5.90	10	8	8.27	5.91	6.42	47.87	—	95.08	106.89	—	—	9.02	20.08	16.54	17.32	20.98	3.39
LCV 200-610 3	6.70	10	8	8.27	5.91	6.42	47.87	—	—	—	118.70	—	9.02	20.08	16.54	17.32	20.98	3.39
LCV 200-610 4	7.88	10	8	8.27	5.91	6.42	52.80	—	—	—	—	135.47	9.02	20.08	16.54	17.32	20.98	3.39
LCV 250-660 4	7.88	12	10	9.65	6.89	6.42	52.80	—	96.69	108.50	120.31	132.13	10.98	22.05	18.90	20.08	23.94	3.94
LCV 300-710 4	7.88	14	12	11.42	6.89	6.42	52.80	—	100.04	111.85	123.66	—	12.99	25.20	22.05	24.02	27.68	3.94

**Installation Dimensions**

Pump size	Mounting Plate									Shaft end					
	c	e	m	n	g	g <sub>1</sub>	S	k		d (mm)	i	t (mm)	u (mm)	v (mm)	x (mm)
LCV 50-230 1	25.00	25.98	14.25	12.52	17.99	1.81	.79	.98		50	6.38	44.5	14	115	9
LCV 80-300 2	30.98	32.99	19.02	15.51	20.94	2.60	.87	1.42		70	7.09	62.5	20	175	12
LCV 100-400 2	37.99	35.98	18.98	19.02	25.71	3.54	.87	1.42		70	7.09	62.5	20	175	12
LCV 150-500 3	46.73	45.79	25.55	24.09	38.11	3.82	1.02	1.42		100	10.24	90	28	215	16
LCV 200-610 3	52.99	50.00	25.51	27.36	37.87	5.98	1.18	1.42		100	10.24	90	28	215	16
LCV 200-610 4	52.99	50.00	25.51	27.36	36.77	4.65	1.18	1.42		100	9.45	114	32	230	18
LCV 250-660 4	56.69	55.63	28.39	29.61	40.04	5.75	1.18	1.42		100	9.45	114	32	230	18
LCV 300-710 4	64.02	65.31	32.87	33.78	48.15	7.44	1.18	1.42		100	9.45	114	32	230	18



## 9.2 LCV M Pump Assembly, Metric Dimensions



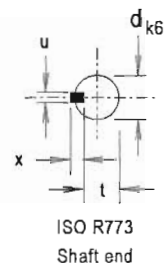
**Pump Dimensions**

Dimensions in mm

Pump and Frame Size	Shaft Size	Pump DN <sub>1</sub>	Pump DN <sub>2</sub>	a	a <sub>1</sub>	b	f	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	r	h <sub>1</sub>	w <sub>1</sub> (ref.)	w <sub>2</sub> (ref.)	w <sub>3</sub> (ref.)	q (ref.)
LCV 50-230 1	90	80	50	115	75	156	861	1722	2022	—	—	—	114	230	170	175	220	40
LCV 50-230 1	110	80	50	115	75	156	861	—	—	2322	—	—	114	230	170	175	220	40
LCV 80-300 2	110	100	80	120	100	156	1005	1906	2206	—	—	—	140	270	225	240	295	48
LCV 80-300 2	130	100	80	120	100	156	1005	—	—	2506	—	—	140	270	225	240	295	48
LCV 100-400 2	110	150	100	135	124	156	1005	1957	2257	—	—	—	165	325	285	300	365	56
LCV 100-400 2	130	150	100	135	124	156	1005	—	—	2557	—	—	165	325	285	300	365	56
LCV 150-500 3	150	200	150	175	150	163	1216	—	2356	2656	2956	—	203	410	360	375	450	67
LCV 150-500 3	170	200	150	175	150	163	1216	—	—	—	—	3256	203	410	360	375	450	67
LCV 200-610 3	150	250	200	210	150	163	1216	—	2415	2715	—	—	229	510	420	440	533	86
LCV 200-610 3	170	250	200	210	150	163	1216	—	—	—	3015	—	229	510	420	440	533	86
LCV 200-610 4	200	250	200	210	150	163	1341	—	—	—	—	3441	229	510	420	440	533	86
LCV 250-660 4	200	300	250	245	175	183	1341	—	2456	2756	3056	3356	279	560	480	510	608	100
LCV 300-710 4	200	350	300	290	175	163	1341	—	2541	2841	3141	—	330	640	560	610	703	100

**Installation Dimensions**

Pump size	Mounting Plate									Shaft end					
	c	e	m	n	g	g <sub>1</sub>	S	k	d	i	t	u	v	x	
LCV 50-230 1	635	660	362	318	457	46	20	25	50	162	44.5	14	115	9	
LCV 80-300 2	787	838	483	394	532	66	22	36	70	180	62.5	20	175	12	
LCV 100-400 2	965	914	482	483	653	90	22	36	70	180	62.5	20	175	12	
LCV 150-500 3	1187	1163	649	612	968	97	26	36	100	260	90	28	215	16	
LCV 200-610 3	1346	1270	648	695	962	152	30	36	100	260	90	28	215	16	
LCV 200-610 4	1346	1270	648	695	934	118	30	36	100	240	114	32	230	18	
LCV 250-660 4	1440	1413	721	752	1017	146	30	36	100	240	114	32	230	18	
LCV 300-710 4	1626	1659	835	858	1223	189	30	36	100	240	114	32	230	18	





### 9.3 LCV Flange Connections, U.S. Dimensions

The pipes must be connected without transmitting any stresses or strain!  
NF E 44-145

#### Connection flanges

Pump size	DN <sub>1</sub>			DN <sub>2</sub>		
	I.D.	Type	9A	I.D.	Type	
50-230	3		M20	2 <sup>+</sup>		
80-300	4		M20	3		
100-400	6 <sup>+</sup>		M24	4		
150-500	8 <sup>+</sup>		M20	6 <sup>+</sup>		
200-610	10		M20	8 <sup>+</sup>		
250-660	12		M24	10		
300-710	14		M24	12		

#### Flange dimensions

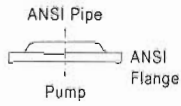
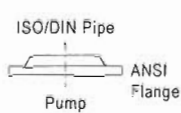
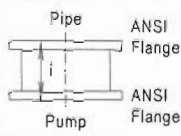
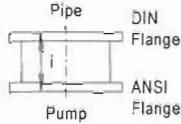
I.D.	ANSI	DIN
2 <sup>+</sup>	B16.5 <sup>3)</sup>	2533-16
3	B16.5 <sup>3)</sup>	2533-16 <sup>4)</sup>
4	B16.5 <sup>3)</sup>	2533-16 <sup>4)</sup>
6 <sup>+</sup>	B16.5 <sup>3)</sup>	2533-16
8 <sup>+</sup>	B16.5 <sup>3)</sup>	2532-10
10	B16.5 <sup>3)</sup>	2532-10 <sup>4)</sup>
12	B16.5 <sup>3)</sup>	2532-10 <sup>4)</sup>
14	B16.5 <sup>3)</sup>	2532-10 <sup>4)</sup>

3) All pump flanges are interchangeable with ANSI B16.5, 150 psi (10 bar)

4) Adapter B or D required

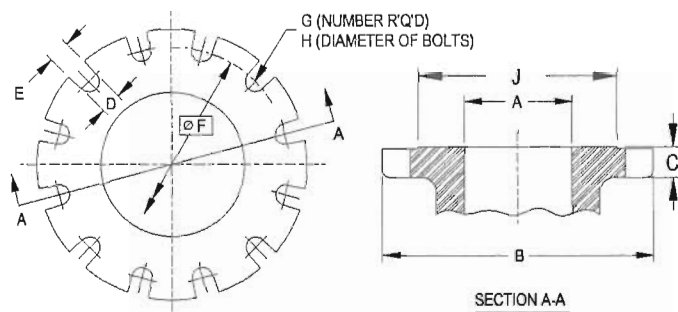
+ indicates pump flanges also interchangeable with DIN 2533-16

#### Adapter types

Weldable Flange	Type A	
	Type B	
Spool Piece	Type C	
	Type D	

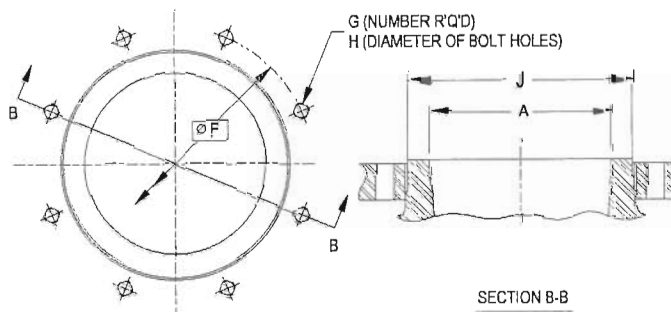
I.D.	i
2 <sup>+</sup>	6.3
3	6.3
4	6.3
6 <sup>+</sup>	7.9
8 <sup>+</sup>	7.9
10	9.0
12	9.0
14	9.0

### LCV Flange Dimensions, U.S. Dimensions



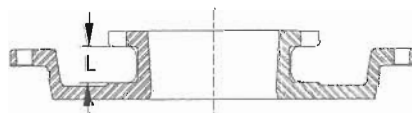
TYPE 1

CAST IRON FLANGE WITH SLOTS



TYPE 2

FAB STEEL FLANGE WITH DRILLED HOLES



SUCTION FLANGE

### LCV - M

Pump Size	Suction Flange											Discharge Flange									
	Type	A	B	C	D	E	F	G	H	J	L	Type	A	B	C	D	E	F	G	H	J
50-230	1	3	7.48	0.87	0.79	0.98	5.91	4	M16	4.92	1.54	2	2	n/a	n/a	n/a	n/a	4.76	4	.87	n/a
80-300	1	4	9.06	0.87	0.79	0.98	7.48	8	M16	5.90	1.42	2	3	n/a	n/a	n/a	n/a	5.98	4	.79	n/a
100-400	1	6	11.02	0.94	0.98	1.18	9.45	8	M20	8.46	1.34	2	4	n/a	n/a	n/a	n/a	7.48	8	.75	n/a
150-500	1	8	13.58	1.26	0.98	1.18	11.81	8	M20	10.63	2.09	2	6	n/a	n/a	n/a	n/a	9.49	6	.87	n/a
200-610	1	10	15.94	1.26	1.18	1.38	14.17	12	M20	12.79	2.60	2	8	n/a	n/a	n/a	n/a	11.73	8	.87	n/a
250-660	1	12	18.90	1.34	1.18	1.38	16.93	12	M27	14.96	2.99	2	10	n/a	n/a	n/a	n/a	14.25	12	.87	n/a
300-710	1	14	21.06	1.46	1.18	1.38	18.70	12	M27	16.34	3.27	2	12	n/a	n/a	n/a	n/a	17.00	12	.87	n/a

## 9.4 LCV Flange Connections, Metric Dimensions

The pipes must be connected without transmitting any stresses or strain!  
NF E 44-145

### Connection flanges

Pump size	DN <sub>1</sub>			DN <sub>2</sub>	
	D.N. [mm]	Type	LCC-H 9A	D.N. [mm]	Type
50-230	80		n/a	50 <sup>+</sup>	
80-300	100		n/a	80	
100-400	150 <sup>+</sup>		n/a	100	
150-500	200 <sup>+</sup>		M20	150 <sup>+</sup>	
200-610	250		M20	200 <sup>+</sup>	
250-660	300		M24	250	
300-710	350		M24	300	

### Flange dimensions

D.N. [mm]	ANSI	DIN
50 <sup>+</sup>	B16.5 <sup>4)</sup>	2533-16
80	B16.5 <sup>4)</sup>	2533-16 <sup>5)</sup>
100	B16.5 <sup>4)</sup>	2533-16 <sup>5)</sup>
150 <sup>+</sup>	B16.5 <sup>4)</sup>	2533-16
200 <sup>+</sup>	B16.5 <sup>4)</sup>	2532-10
250	B16.5 <sup>4)</sup>	2532-10 <sup>5)</sup>
300	B16.5 <sup>4)</sup>	2532-10 <sup>5)</sup>
350	B16.5 <sup>4)</sup>	2532-10 <sup>5)</sup>

4) All pump flanges are interchangeable with ANSI B16.5, 150 psi (10 bar)

5) Adapter B or D required

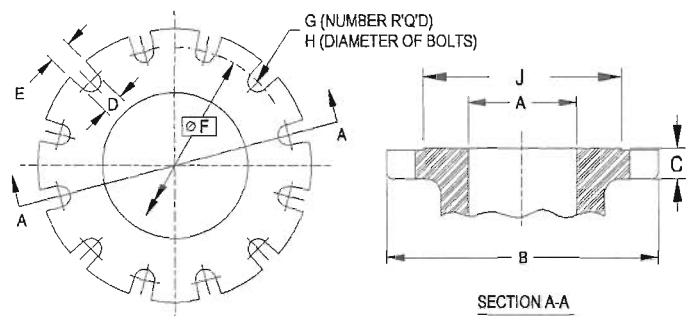
+ indicates pump flanges also interchangeable with DIN 2533-16

### Adapter types

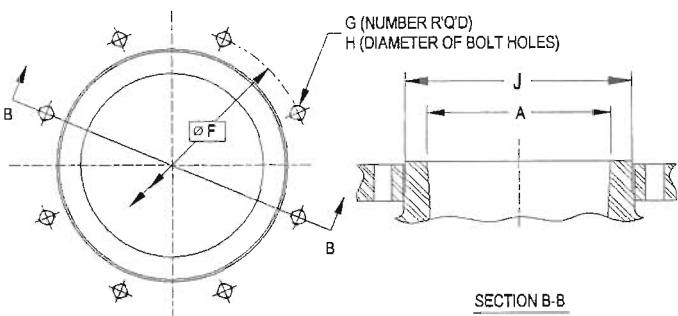
Weldable Flange	Type A	ANSI Pipe Pump ANSI Flange
	Type B	ISO/DIN Pipe Pump ANSI Flange
Spool Piece	Type C	Pipe Pump ANSI Flange
	Type D	Pipe Pump DIN Flange

D.N. [mm]	i [mm]
50 <sup>+</sup>	160
80	160
100	160
150 <sup>+</sup>	200
200 <sup>+</sup>	200
250	230
300	230
350	230

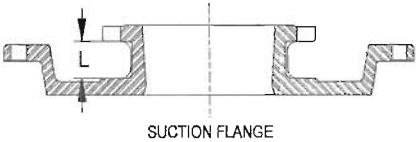
LCV Flange Dimensions, Metric Dimensions



TYPE 1  
CAST IRON FLANGE WITH SLOTS



TYPE 2  
FAB STEEL FLANGE WITH DRILLED HOLES

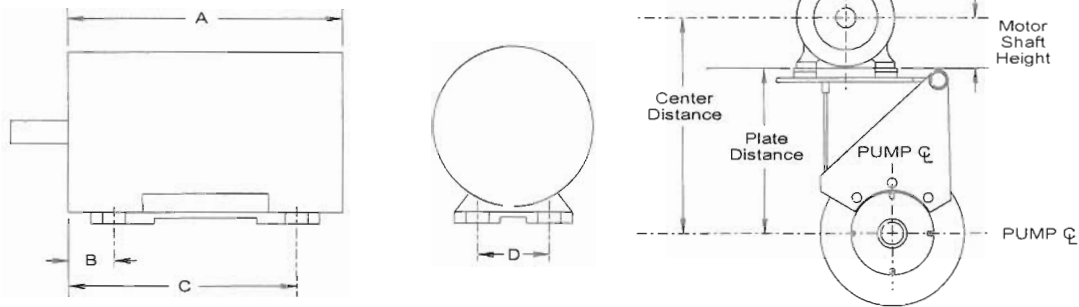


SUCTION FLANGE

LCV - M

Pump Size	Suction Flange											Discharge Flange									
	Type	A	B	C	D	E	F	G	H	J	L	Type	A	B	C	D	E	F	G	H	J
50-230	1	76	190	22	20	25	150	4	M16	125	39	2	51	n/a	n/a	n/a	n/a	121	4	22	n/a
80-300	1	100	230	22	20	25	190	8	M16	150	36	2	76	n/a	n/a	n/a	n/a	152	4	20	n/a
100-400	1	150	280	24	25	30	240	8	M20	215	34	2	102	n/a	n/a	n/a	n/a	190	8	19	n/a
150-500	1	205	345	32	25	30	300	8	M20	270	53	2	152	n/a	n/a	n/a	n/a	241	8	22	n/a
200-610	1	255	405	32	30	35	360	12	M20	325	66	2	203	n/a	n/a	n/a	n/a	298	8	22	n/a
250-660	1	305	480	34	30	35	430	12	M27	380	76	2	255	n/a	n/a	n/a	n/a	362	12	22	n/a
300-710	1	355	535	37	30	35	475	12	M27	415	83	2	305	n/a	n/a	n/a	n/a	432	12	22	n/a

## 9.5 Motor Mount Limitations



### LCV STANDARD MOTOR MOUNT APPLICATION LIMITATIONS

(FOR APPLICATIONS BEYOND THESE LIMITATIONS, CONTACT ENGINEERING)

LCV 50 - 230		
MOTOR MOUNT	MAX. MOTOR HP/WT (kg)	PLATE DISTANCE
4413C	30/210	416
LIMITING MOTOR DIMENSIONS		
ALL PUMP SIZES	MOUNT	
	4413C	
A (MAX)	690	
B (MIN)	57	
C (MAX)	431	
D (MAX)	379	

LCV 80 - 300		
MOTOR MOUNT	MAX. MOTOR HP/WT (kg)	PLATE DISTANCE
4437C 7639D	30/210 100/500	520 520
LIMITING MOTOR DIMENSIONS		
ALL PUMP SIZES	MOUNT	
	4437C	7639D
A (MAX)	807	696
B (MIN)	57	29
C (MAX)	431	432
D (MAX)	379	416

LCV 100 - 400		
MOTOR MOUNT	MAX. MOTOR HP/WT (kg)	PLATE DISTANCE
4437C 7639D	30/210 100/500	520 520
LIMITING MOTOR DIMENSIONS		
ALL PUMP SIZES	MOUNT	
	4437C	7639D
A (MAX)	807	696
B (MIN)	57	29
C (MAX)	431	432
D (MAX)	379	416

LCV 150 - 500		
MOTOR MOUNT	MAX. MOTOR HP/WT (kg)	PLATE DISTANCE
4416C	250/1700	765
LIMITING MOTOR DIMENSIONS		
ALL PUMP SIZES	MOUNT	
	4416C	
A (MAX)	931	
B (MIN)	30	
C (MAX)	690	
D (MAX)	561	

LCV 200 - 610		
MOTOR MOUNT	MAX. MOTOR HP/WT (kg)	PLATE DISTANCE
4416C 4558C	250/1700 250/1700	765 765
LIMITING MOTOR DIMENSIONS		
ALL PUMP SIZES	MOUNT	
	4416C	4558C
A (MAX)	931	1044
B (MIN)	30	46
C (MAX)	690	872
D (MAX)	561	561

LCV 250 - 660		
MOTOR MOUNT	MAX. MOTOR HP/WT (kg)	PLATE DISTANCE
4558C	250/1700	765
LIMITING MOTOR DIMENSIONS		
ALL PUMP SIZES	MOUNT	
	4558C	
A (MAX)	1044	
B (MIN)	46	
C (MAX)	872	
D (MAX)	561	

LCV 300 - 710		
MOTOR MOUNT	MAX. MOTOR HP/WT (kg)	PLATE DISTANCE
4558C	250/1700	765
LIMITING MOTOR DIMENSIONS		
ALL PUMP SIZES	MOUNT	
	4558C	
A (MAX)	1044	
B (MIN)	46	
C (MAX)	872	
D (MAX)	561	

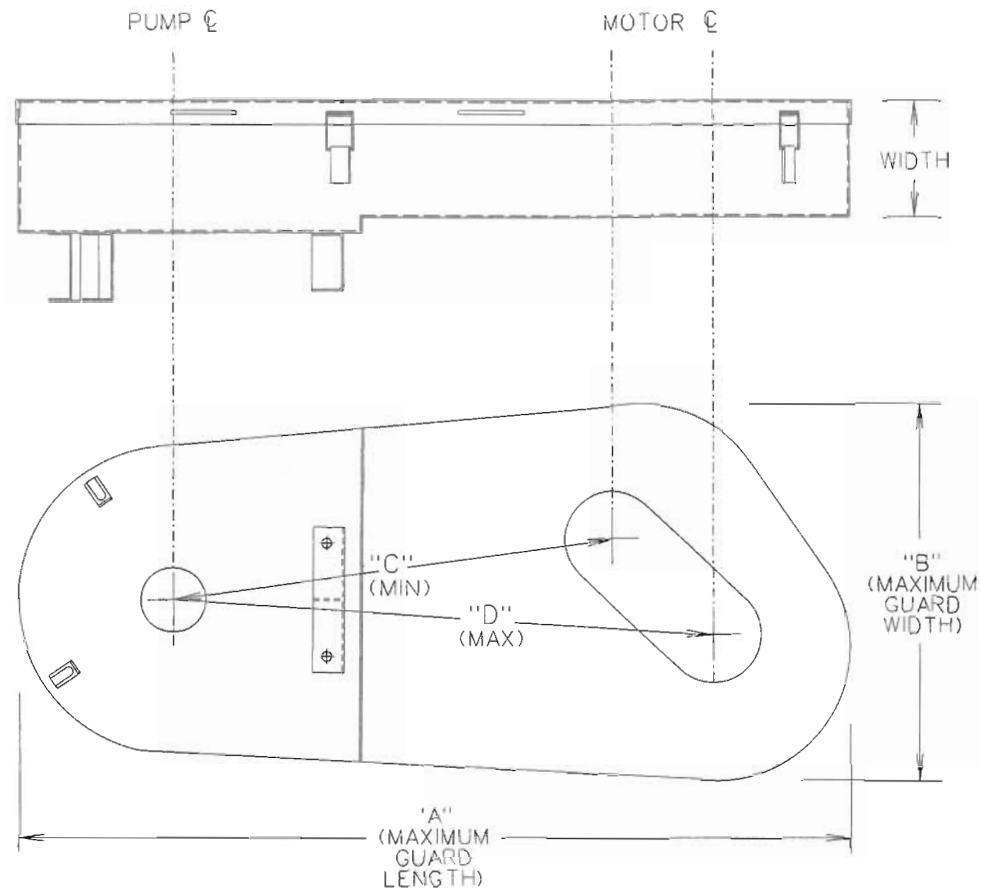
#### TO USE:

1. Based on the pump size, refer to one of the above seven tables.
2. Verify that the motor does not exceed the Weight and Dimension limitations given in the table.
3. Verify that the Plate Distance limitations given in the table are acceptable for your drive components. Calculate actual plate distance as follows: (Remember to allow room for belt adjustment.)

$$\text{Plate Distance} = \text{Center Distance} - \text{Motor Shaft Height.}$$

Consult GIW Engineering for applications that exceed motor limitations.

## 9.6 LCV Drive Guards



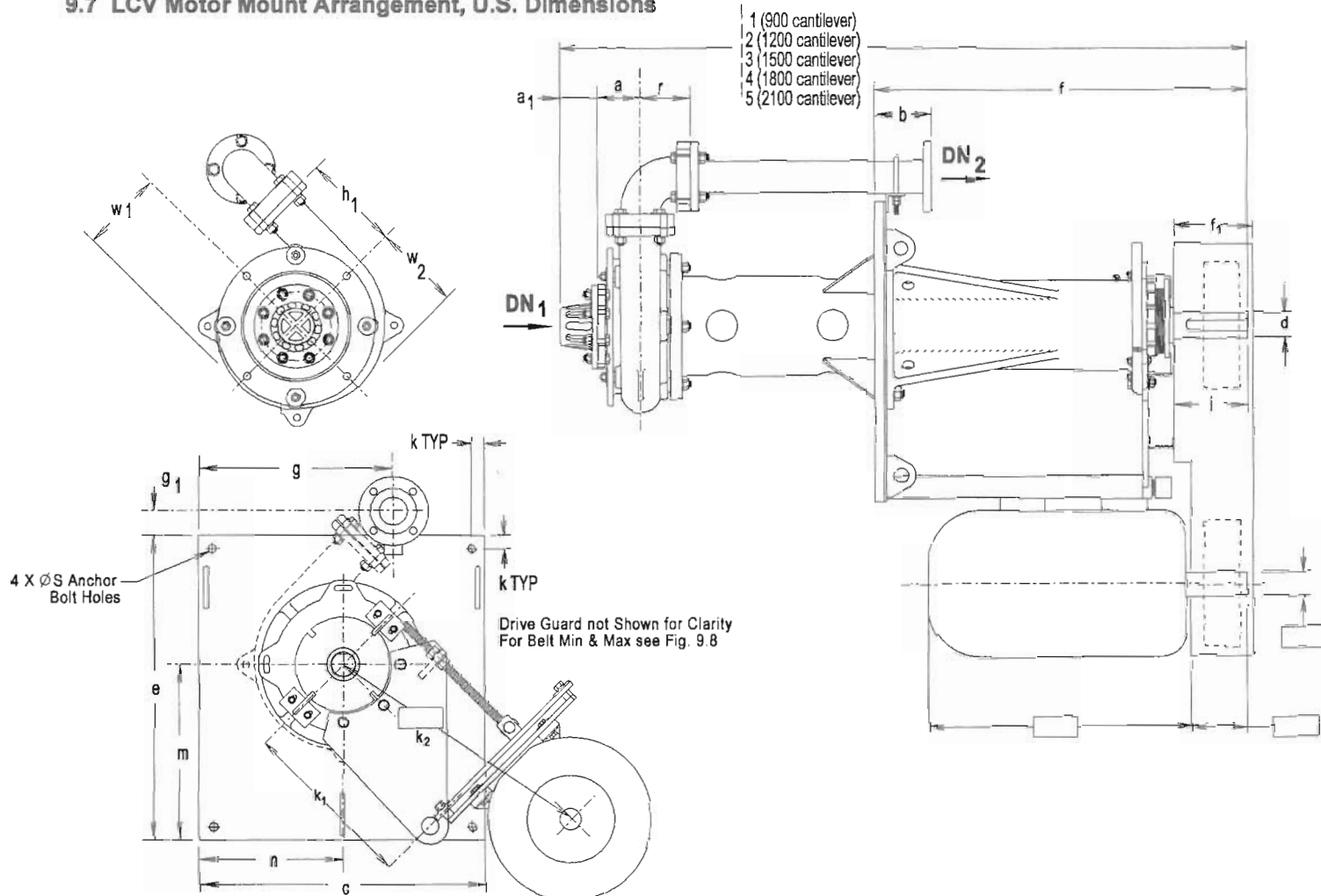
Drive Guard Dimensions and Sheave Limitations

Dimensions in mm

PUMP SIZE	*	NUMBER	GUARD SIZE	BELT CENTER		MAX HP	MAXIMUM SHEAVE (mm)		
			A x B	C	D		MOTOR	PUMP	WIDTH
LCV 50-230	1	1732B	1060 x 470	578	730	30	207	310	183
LCV 80-300	2A	1732B	1060 x 470	578	730	30	207	310	183
	2	1733B	1295 x 585	690	850	100	330	430	183
LCV 100-400	2A	1732B	1060 x 470	578	730	30	207	310	183
	2	1733B	1295 x 585	690	850	100	330	430	183
LCV 150-500	3	1734B	1830 x 840	930	1190	250	330	800	156
LCV 200-610	3	1734B	1830 x 840	930	1190	250	330	800	156
	4	1735B	1830 x 840	930	1190	250	330	800	200
LCV 250-660	4	1735B	1830 x 840	930	1190	350	330	800	200
LCV 300-710	4	1735B	1830 x 840	930	1190	350	330	800	200

- \* 1 = Frame 1 with 215T, 256T, or 286T Motor Frame
- 2A = Frame 2 with 215T, 256T, or 286T Motor Frame
- 2 = Frame 2 with 326T, 365T, or 405T Motor Frame
- 3 = Frame 3 with 284T thru 449T Motor Frame
- 4 = Frame 4 with 405T thru 449T Motor Frame

## 9.7 LCV Motor Mount Arrangement, U.S. Dimensions



### Pump Dimensions

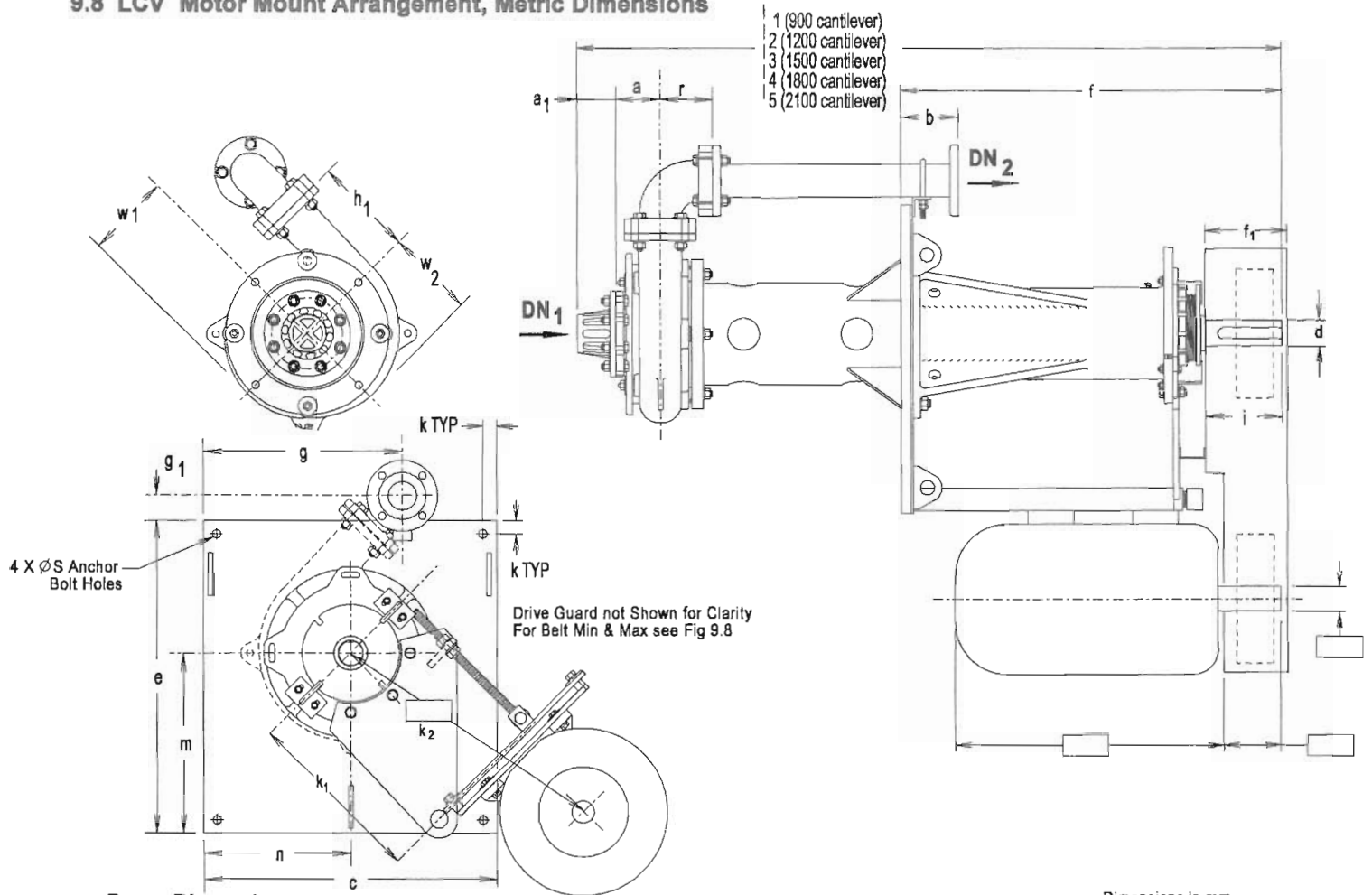
Dimensions in inches (US)  
(Shaft in mm)

Pump and Frame Size	Shaft Sizes	Pump DN <sub>1</sub>	Pump DN <sub>2</sub>	a	a <sub>1</sub>	b	f	f <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	r	b <sub>1</sub>	w <sub>1</sub> (max)	w <sub>2</sub> LCV-M
LCV 50-230 1	3.54	3	2	4.53	2.95	6.14	33.90	8.15	67.80	79.61	—	—	—	4.49	9.08	8.82	6.89
LCV 50-230 1	4.33	3	2	4.53	2.95	6.14	33.90	8.15	—	—	91.42	—	—	4.49	9.06	8.82	6.89
LCV 80-300 2	4.33	4	3	4.72	3.94	6.14	39.57	8.15	75.04	86.85	—	—	—	5.51	10.63	11.38	9.45
LCV 80-300 2	5.12	4	3	4.72	3.94	6.14	39.57	8.15	—	—	98.66	—	—	5.51	10.63	11.38	9.45
LCV 100-400 2	4.33	6	4	5.31	4.88	6.14	39.57	8.15	77.05	88.86	—	—	—	6.50	12.80	14.29	11.81
LCV 100-400 2	5.12	6	4	5.31	4.88	6.14	39.57	8.15	—	—	100.67	—	—	6.50	12.80	14.29	11.81
LCV 150-500 3	5.90	8	6	6.89	5.91	6.42	47.87	9.92	—	92.76	104.57	116.38	—	7.99	16.14	17.95	14.76
LCV 150-500 3	6.70	8	6	6.89	5.91	6.42	47.87	9.92	—	—	—	—	128.19	7.99	16.14	17.95	14.76
LCV 200-610 3	5.90	10	8	8.27	5.91	6.42	47.87	9.92	—	95.08	106.89	—	—	9.02	20.08	21.14	17.32
LCV 200-610 3	6.70	10	8	8.27	5.91	6.42	47.87	9.92	—	—	—	118.70	—	9.02	20.08	21.14	17.32
LCV 200-610 4	7.88	10	8	8.27	5.91	6.42	52.80	9.92	—	—	—	—	135.47	9.02	20.08	21.14	17.32
LCV 250-660 4	7.88	12	10	9.65	6.89	6.42	52.80	9.92	—	96.69	108.50	120.31	132.13	10.98	22.05	23.82	20.08
LCV 300-710 4	7.88	14	12	11.42	6.89	6.42	52.80	9.92	—	100.04	111.85	123.66	—	12.99	25.20	27.24	24.02

### Installation Dimensions

Pump size		Mounting Plate and Motor Mount											Shaft end	
		c	e	m	n	g	g <sub>1</sub>	S	lk	k <sub>1</sub>	k <sub>2 min</sub>	k <sub>2 max</sub>	d (mm)	i
	LCV 50-230 1	25.00	25.98	14.25	12.52	17.99	1.81	.79	.98	14.89	20.07	28.74	50	6.38
	LCV 80-300 2	30.98	32.99	19.02	15.51	20.94	2.80	.87	1.42	18.94	SEE 1699B		70	7.09
	LCV 100-400 2	37.99	35.98	18.98	19.02	25.71	3.54	.87	1.42	18.94	SEE 1699B		70	7.09
	LCV 150-500 3	46.73	45.79	25.55	24.09	38.11	3.82	1.02	1.42	28.49	36.61	46.85	100	10.24
	LCV 200-610 3	52.99	50.00	25.51	27.36	37.87	5.98	1.18	1.42	28.49	36.61	46.85	100	10.24
	LCV 200-610 4	52.99	50.00	25.51	27.36	36.77	4.65	1.18	1.42	28.49	36.61	46.85	100	9.45
	LCV 250-660 4	56.89	55.63	28.39	29.61	40.04	5.75	1.18	1.42	28.49	36.61	46.85	100	9.45
	LCV 300-710 4	64.02	65.31	32.87	33.78	48.15	7.44	1.18	1.42	28.49	36.61	46.85	100	9.45

## 9.8 LCV Motor Mount Arrangement, Metric Dimensions



Pump Dimensions

Dimensions in mm

Pump and Frame Size	Shaft Size	Pump DN <sub>1</sub>	Pump DN <sub>2</sub>	a	a <sub>1</sub>	b	f	f <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	r	h <sub>1</sub>	w <sub>1</sub> (max)	w <sub>2</sub> LCV-M
LCV 50-230 1	90	80	50	115	75	156	861	207	1722	2022	—	—	—	114	230	224	175
LCV 50-230 1	110	80	50	115	75	156	861	207	—	—	2322	—	—	114	230	224	175
LCV 80-300 2	110	100	80	120	100	156	1005	207	1906	2206	—	—	—	140	270	289	240
LCV 80-300 2	130	100	80	120	100	156	1005	207	—	—	2506	—	—	140	270	289	240
LCV 100-400 2	110	150	100	135	124	156	1005	207	1957	2257	—	—	—	165	325	363	300
LCV 100-400 2	130	150	100	135	124	156	1005	207	—	—	2557	—	—	165	325	363	300
LCV 150-500 3	150	200	150	175	150	163	1216	252	—	2356	2656	2956	—	203	410	456	375
LCV 150-500 3	170	200	150	175	150	163	1216	252	—	—	—	—	3256	203	410	456	375
LCV 200-610 3	150	250	200	210	150	163	1216	252	—	2415	2715	—	—	229	510	537	440
LCV 200-610 3	170	250	200	210	150	163	1216	252	—	—	—	—	—	229	510	537	440
LCV 200-610 4	200	250	200	210	150	163	1341	252	—	—	—	—	—	229	510	537	440
LCV 250-660 4	200	300	250	245	175	163	1341	252	—	2456	2756	3056	3356	279	560	605	510
LCV 300-710 4	200	350	300	290	175	163	1341	252	—	2541	2841	3141	—	330	640	692	610

Installation Dimensions

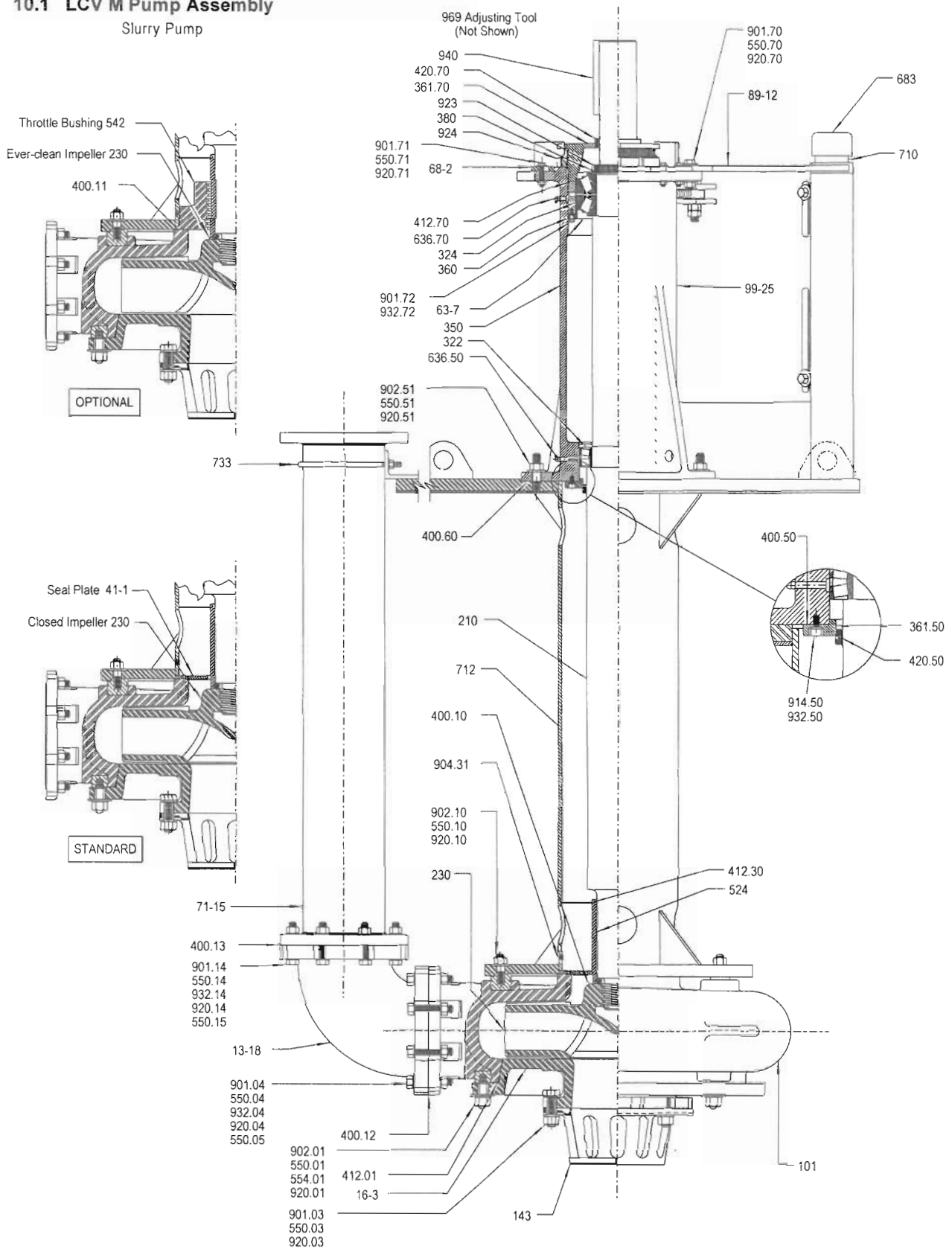
Pump size		Mounting Plate and Motor Mount										Shaft end		
		c	e	m	n	g	g <sub>1</sub>	S	k	k <sub>1</sub>	k <sub>2 min</sub>	k <sub>2 max</sub>	d	l
	LCV 50-230 1	635	660	362	318	457	46	20	25	378	510	730	50	162
	LCV 80-300 2	787	838	483	394	532	66	22	36	481	SEE 1698B		70	180
	LCV 100-400 2	965	914	482	483	653	90	22	36	481	SEE 1698B		70	180
	LCV 150-500 3	1187	1163	649	612	968	97	26	36	724	930	1190	100	260
	LCV 200-610 3	1346	1270	648	695	962	152	30	36	724	930	1190	100	260
	LCV 200-610 4	1346	1270	648	695	934	118	30	36	724	930	1190	100	240
	LCV 250-660 4	1440	1413	721	752	1017	146	30	36	724	930	1190	100	240
	LCV 300-710 4	1626	1659	835	858	1223	189	30	36	724	930	1190	100	240



## 10 Cross-Sectional Drawings With Parts List

### 10.1 LCV M Pump Assembly

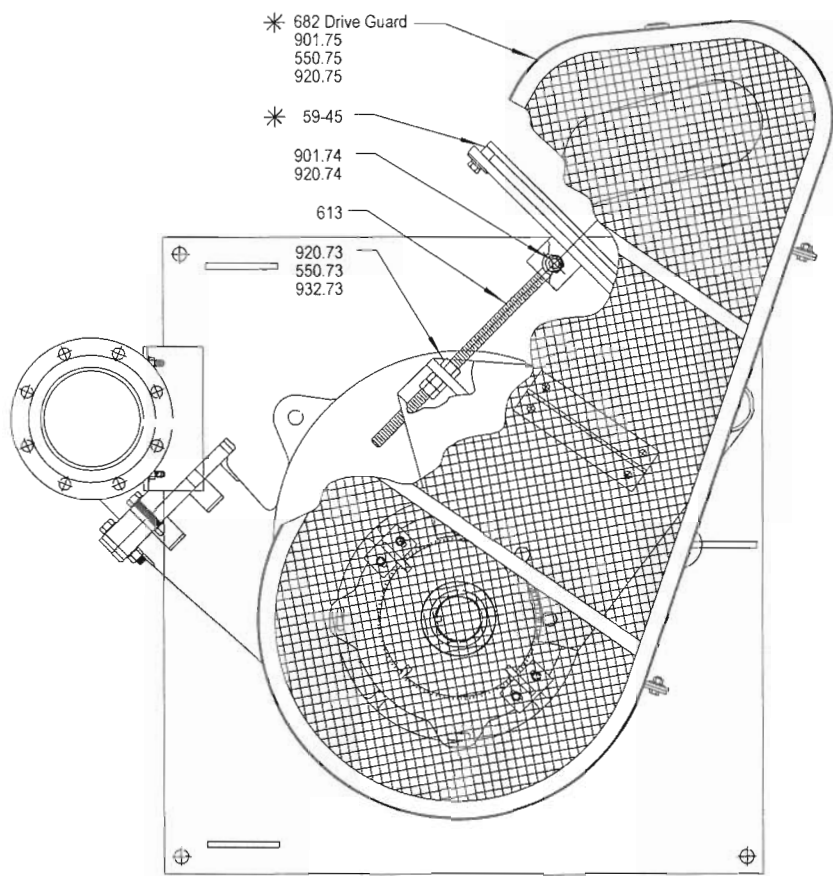
Slurry Pump



## 10.1 LCV M Pump Assembly

Part No.	Designation	Part No.	Designation	Part No.	Designation	Part No.	Designation
101	Pump casing	41-1	Seal plate (standard)	636.50 / .70	Lincoln spin drive	904.31	Hex-set screw
143	Suction strainer	412.01 / .30	O-ring	683	Pipe cap	914.50 / .60	Socket head cap screw
13-18	Cast elbow	/ .70		63-7	Grease retaining ring	920.01 / .03	Nut
16-3	Suction plate/liner	420.50 / .70	Inpro Seal	68-2	Locking plate	.04 / .10	
210	Shaft	524	Shaft protecting sleeve	710	Mounting plate pipe	.14 / .51	
230	Impeller	542	Throttle bushing (optional)	712	Support assembly	.70 / .71	
322	Radial roller bearing	550.01 / .03	Washer	71-15	Riser	923	Bearing nut
324	Tapered roller bearing	.04 / .05		733	Pipe clamp	924	Adjusting nut
350	Bearing housing	.10 / .14		89-12	Mounting plate assembly bracket	932.04 / .14	Lock washer
360	Bearing cover	.15 / .51		901.03 / .04	Hex-head screw	.50 / .72	
361.50	Bearing end cover (imp. end)	.70 / .71		.14 / .70		940	Key
361.70	Adjustable end cover	554.01	Washer (large dia.)	.71 / .72		969	Adjusting tool
380	Bearing lock washer			902.01 / .10	Stud	99-25	Bearing assembly
400.10 / .11	Gasket			/ .51			
12 / .13							
.50 / .60							

10.2 LCV Motor Mount Fasteners and Auxillary Equipment



\* AUXILLARY EQUIPMENT NOT INCLUDED  
ON BILL OF MATERIALS

Drive Guards - See Section 9.8  
Motor Mount - See Section 9.7

Adjusting Tools:	4410C	4362C	4380C	4519C
Frames:	50-230	80-300 100-400	80-300 150-500 200-610	150-500 200-610 250-660 300-710

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## 10.2 LCV M Pump Assembly

Part No.	Designation
550.73/1.75	Washer
59.45	Motor mounting plate assembly
613	Mounting plate adjustment rod
682	Drive guard
901.74/1.75	Hex-head screw
920.73/1.74	Nut
932.73	Lock washer

NOTES:

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## 11. Performance Book

Multiple-speed clear water performance curves for  
The LCV Series Slurry Pump are found in the LCV  
Performance Curve Booklet

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