



## VACUUM PRIMED NON-CLOG PUMPS SECTION INDEX

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# ENGINEERING DATA



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Vacuum Primed  
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## 4" – PUMPS

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## 6" – PUMPS

### Pump Assembly Drawings & Curves

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- 6B3B / 6C3B / 6D3B Pumps, Pump Curve, 1760 RPM 62L33
- 6B3B / 6C3B / 6D3B Pumps, Pump Curve, 1170 RPM 62L32
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## 8" – PUMPS

### Pump Assembly Drawings & Curves

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- 8C4D / 8D4D Pumps, Pump Curve, 1170 RPM 62L157
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### Pump Assembly Drawings & Curves

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**X-PELLER®** Pump with  
Mono-Port Impeller  
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## NOTES ON DESIGN FOR X-PELLER® PUMP

Smith & Loveless has raised non-clog pumping to a new level with the Smith & Loveless **X-PELLER®** pump design. In addition to all of the features and associated benefits incorporated in the traditional Smith & Loveless pump design (such as solid stainless steel shaft, oversized bearings, full diameter impeller shrouds, tapered shaft, long life seal, etc.), Smith & Loveless **X-PELLER®** pumps with the patented mono-port hydraulic design give a new meaning to the term “non-clog”.

The unique mono-port, single passageway, “V” vane design virtually eliminates the opportunity for pump solids to hang up in the impeller. Stringy material, which used to hang up on the leading edges of the vanes of two-port impellers, now has no place to lodge, and passes freely through the pump. Passageway openings through the impeller have a cross-section of at least 10.6 square inches, and clearance to pass a three-inch (3”) sphere, so large solids are not a problem either.

A typical two-port pump impeller includes a single suction eye having two ports opening into opposing expanding chambers. The ports have smaller openings than the single, axial opening of the suction eye, due to the fact that each port handles one-half of the total flow. Solids, which are small enough to enter the suction eye axial opening, may be too large to pass through either port, eventually significantly plugging the impeller. Stringy material may have one end drawn into one port and the other end drawn into the other port. Thus, the material may be draped around the base edge of an impeller vane. More stringy materials can build up this way, and the ports can become substantially clogged. Furthermore, even if the materials impeding flow through the ports do not completely clog the impeller, the buildup of these materials may cause the pump impeller to be out of balance, resulting in pump vibration.

To alleviate these problems, a mono-port centrifugal pump impeller is used in the **X-PELLER®** pump, making it ideal for solids handling, i.e., handling liquids with entrained solid matter. The mono-port impeller design eliminates clogging in solids-handling applications, particularly when handling stringy materials.

The single radial passage through the impeller is essentially the same size as the opening of the suction eye of the impeller, so that any object entering the pump will pass completely through the impeller without clogging.

There are no impeller parts for stringy material to hang on, which would restrict flow through the impeller.

The **X-PELLER®** is ideally suited for pumping applications for prisons, hospitals, mental institutions, and other type applications where high concentrations of large or stringy solids might be expected. The **X-PELLER®** is also ideally suited for sludge pumping applications, such as RAS or WAS flows in a treatment plant. As with all Smith & Loveless pumps, a fresh water seal system is recommended when pumping sludge.

Field experience has shown that plugging is not often a problem with six-inch (6”) pumps, and virtually unheard of in pumps eight inches (8”) and larger, when handling raw sewage. It is mostly in the four-inch (4”) size pumps that plugging has been traditionally a problem. This is due in part to the lower flows involved, as well as the smaller geometry. The **X-PELLER®** pump eliminates the catch points for stringy materials and passes the entire flow through a single port opening, with a cross-sectional area of up to fifty percent (50%) greater than that of the passageway of a two-port impeller. These features greatly improve its clogging resistance.

Another feature of the **X-PELLER®** design is it may be trimmed to a different diameter without having to rebalance the impeller assembly. This is unique to Smith & Loveless, as our competitors’ single port design must be balanced after trimming, and re-balanced after re-trimming. In addition, the balance of the **X-PELLER®** is not only static and mechanically dynamic, but also hydraulic. This is important. It is one thing to have an impeller, which will spin without vibration on a dry test stand, but quite another thing to operate without vibration when subjected to the hydraulic forces of a centrifugal pump. The **X-PELLER®** is balanced to take all of these dynamic forces into consideration. Because of its unique vane shape and hydraulics, the **X-PELLER®** has a somewhat different vibration signature than the standard two-port design. This is entirely normal, and should not be cause for alarm. Vibration with the **X-PELLER®** design is within generally accepted industry standards for non-clog pumps.

There is another advantage to the **X-PELLER®** pump, inherent in the mono-port hydraulic design. The pump performance curve, or impeller line, has a rather steep downward slope. This is important in low flow pumping applications (which usually account for most clog-prone situations). By having a steep pump curve, variations in

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**X-PELLER®** Pump with  
Mono-Port Impeller  
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head on the pump do not have as significant an effect on the flow rate of the pump as they do on a pump with a flatter performance curve. Changes in wet well level, or force main conditions, will not be as apt to cause the pump to back up to Shut-Off or Run-Out and Over-Pump or overload the pump motor. This is a good feature to have in low flow pumping applications.

The **X-PELLER®** design offers good insurance against possible clogging problems when selecting pumps for new installations, especially those with large solids to handle. For existing problem applications where two-port impellers have proven inadequate, the **X-PELLER®** makes an excellent retrofit solution. Replacement **X-PELLERS®** can be retrofitted to most Smith & Loveless four-inch (4") 2-frame pumps and some six-inch (6") 3-frame pumps – both flooded suction and vacuum primed. In addition, the **X-PELLER®** is available for retrofitting into several of our competitors' four-inch (4") and six-inch (6") pump models. Consult the Retrofit Department for specific applications.

Where plugging has been a problem or may be expected to be a problem, and for all large solids handling operations, the **X-PELLER®** is the solution.



## DESIGN FACTORS – NOTES ON FORCE MAIN DESIGN

Under certain unusual conditions, the wet well mounted pump station force main requires special provisions to prevent loss of prime of the station.

Force mains for wastewater discharged from a wet well mounted pump station may be of iron, PVC or other material generally used in the area. Conventional design criteria for force main layout, anchoring, etc., should be followed. It is especially important to provide air release or air/vacuum valves at all high points in the force main.

The station has two rubber-seated check valves in the discharge piping. These valves must be seated airtight when the vacuum pump comes on or else the vacuum pump will suck air through the check valves and the station will not prime. For most installations this is not a problem; if we have a force main, such as shown in Figure 1, where the force main is of considerable length, (at least 150 feet), there is a static head on the check valves, and a large volume of sewage in the force main. Since the force main runs uphill, the sewage cannot flow out of the force main, and there is a static head on the check valves to keep them seated. If there is some sewage leaking back through the check valve, the length of the force main creates enough capacity that it takes a considerable length of time for the sewage to drain back through the check valve and create a loss of prime condition. Since the force main is long, we also have the advantage that the sewage flowing back through the check valve into the wet well will refill the wet well and bring the pump on before the force main is empty. Therefore, when we have a long force main running uphill as shown in Figure 1, we do not have a priming problem because of air being sucked through the check valves.

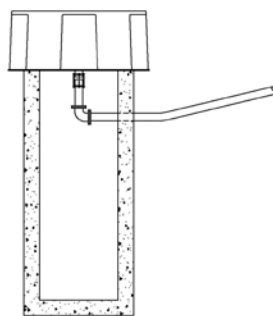


Figure 1

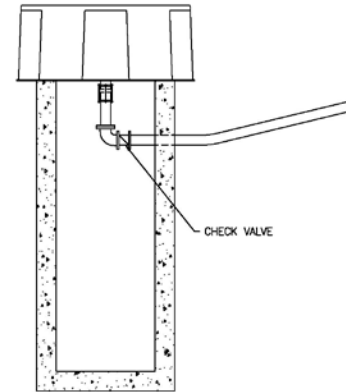


Figure 2

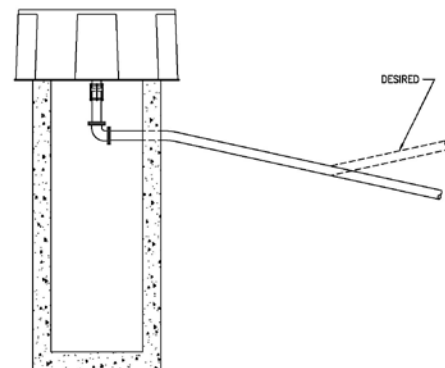


Figure 3

When we have a short force main running uphill from the station, as shown in Figure 2, we can have a priming problem.

If the force main is less than approximately 150 feet long, there is not much reserve capacity in the force main. If one of the discharge check valves is allowing the sewage in the force main to seep back into the wet well, it is possible that the force main will empty back into the wet well before the level in the wet well rises to bring a pump on. Since the check valves do not seal against air, the pump loses its prime, and when the vacuum pump comes on to prime either pump, it sucks air through the force main and leaking check valve and cannot prime the pump.

To prevent this problem, we recommend installing a third check valve in the common discharge from the station. This check valve should be installed in the horizontal run of pipe inside the wet well. The check valve is shipped loose, and is installed in the force main by the installing



contractor. The reason for the third check valve is that this gives a double checking action on both pumps. It is very unlikely that both check valves will be hung up on a mop string or piece of paper at the same time, thus creating a loss of prime.

We can also have a priming problem if we have a long force main running downhill from the station as shown in Figure 3. In this type of installation, after the pump shuts off, the force main empties out by gravity, allowing air to get on the force main side of the check valve. Here again, the pump loses prime, and when the vacuum pump comes on and tries to prime the pump, it sucks air through the empty force main and leaking check valve. To prevent this from happening, we recommend that the force main be installed with the last 50 feet of pipe running uphill, as shown in Figure 3. The invert of the outfall should be at least two pipe diameters above the low point in the force main. This creates a water trap, and when the pump shuts off, air cannot get into the force main, allowing the contents to empty out by gravity. If it is not possible to run the last 50 feet of force main uphill, as shown in Figure 3, then an elbow can be installed on the end of the force main to create the same water trap effect.

The installation shown in Figure 4, a short force main (less than 150 feet) running downhill from the station also creates a possible priming problem. Here we have the possibility of both the force main emptying out by gravity, and the check valve allowing sewage to seep back through the pump. If at all possible, the force main should be extended down into the wet well, and exit at an elevation so that the force main can run uphill from the station. Refer to the dotted line of Figure 4 which shows the recommended force main installation. Here again, if it is not possible to run the force main uphill from the station, an elbow can be installed at the end of the force main. This creates a water trap effect, and does not allow air to enter the force main. If air cannot enter the force main, the sewage cannot flow out by gravity. Once this has been done, we have the same condition that we have in Figure 2. A third check valve must now be installed in the horizontal run of force main in the wet well. This check valve gives a double checking action and prevents the contents of the force main from seeping back through the pump, causing a loss of prime.

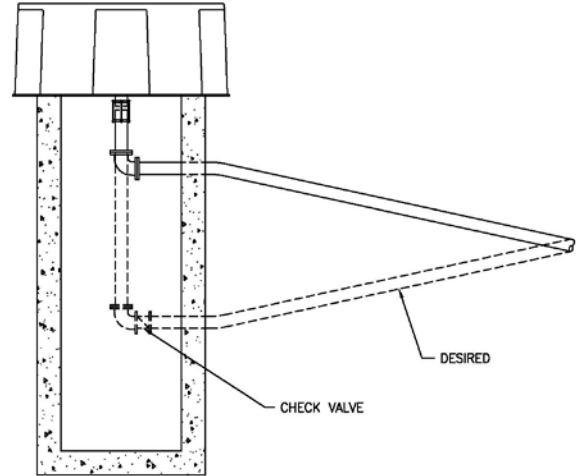


Figure 4

## THE FOLLOWING INFORMATION IS GIVEN FOR GENERAL GUIDELINES

The force main is considered to run uphill from the station if the invert of the outfall is at least two pipe diameters above the low point of the force main. This creates the air-trap effect, so that the sewage will not flow out of the force main by gravity.

The force main is considered to be a short force main, and requires a third check valve, if the volume of the force main is less than the volume of the wet well between the “On” and “Off” levels. Assuming a wet well “On” “Off” capacity of 100 gallons and the force main is four-inch with a capacity of approximately seven-tenths gallon per foot, the force main would have to be approximately 150 feet long to have a capacity of 100 gallons. The reasoning behind this particular design requirements is that if the check valve should seep and allow the sewage to run back through the pump and into the wet well, there will be enough contents in the force main to bring the wet well back up to the “On” position, and the pump will start before the force main empties. As a minimum, the elevation between the “Low-Level Off” float switch and the “Low-Level On” float switch is such that the volume between switches is equal to the pump capacity. If the switches are set farther apart, more capacity is required in the force main.

Of course, in all cases, the outfall must be at a higher elevation than the lowest water level in the wet well. Otherwise, siphoning the wet well dry will cause loss of prime through the suction lines.



The above examples should cover every installation for a wet well mounted pump station. If you have an unusual condition that is not covered by the examples given above, consult the factory, and we will give you a special recommendation for your application.

## PRIMING LOCK LOOP

Another solution that is suitable for any of the problem force mains described previously is a priming lock loop. The purpose here is to form a return loop in the force main, either inside or just outside the wet well. The bottom of the loop must be below the low level "Off" elevation (see Figure 5). This prevents the entire contents of the force main from returning by gravity to the wet well if the check valve does not seat. There will still be enough liquid in the pipe to prime the pump. On force mains that run horizontal or downhill from the station, the last few feet of the force main should run uphill to create a water trap effect in the force main.

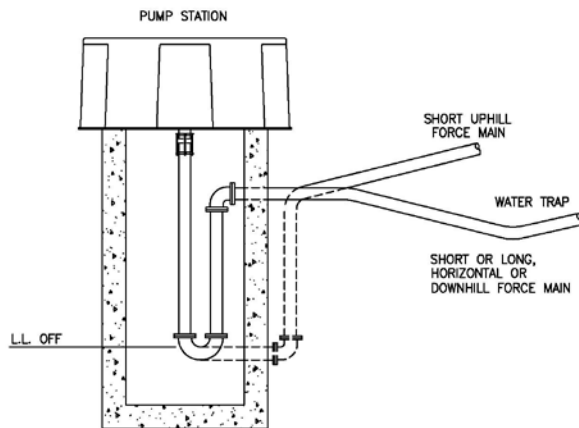


Figure 5



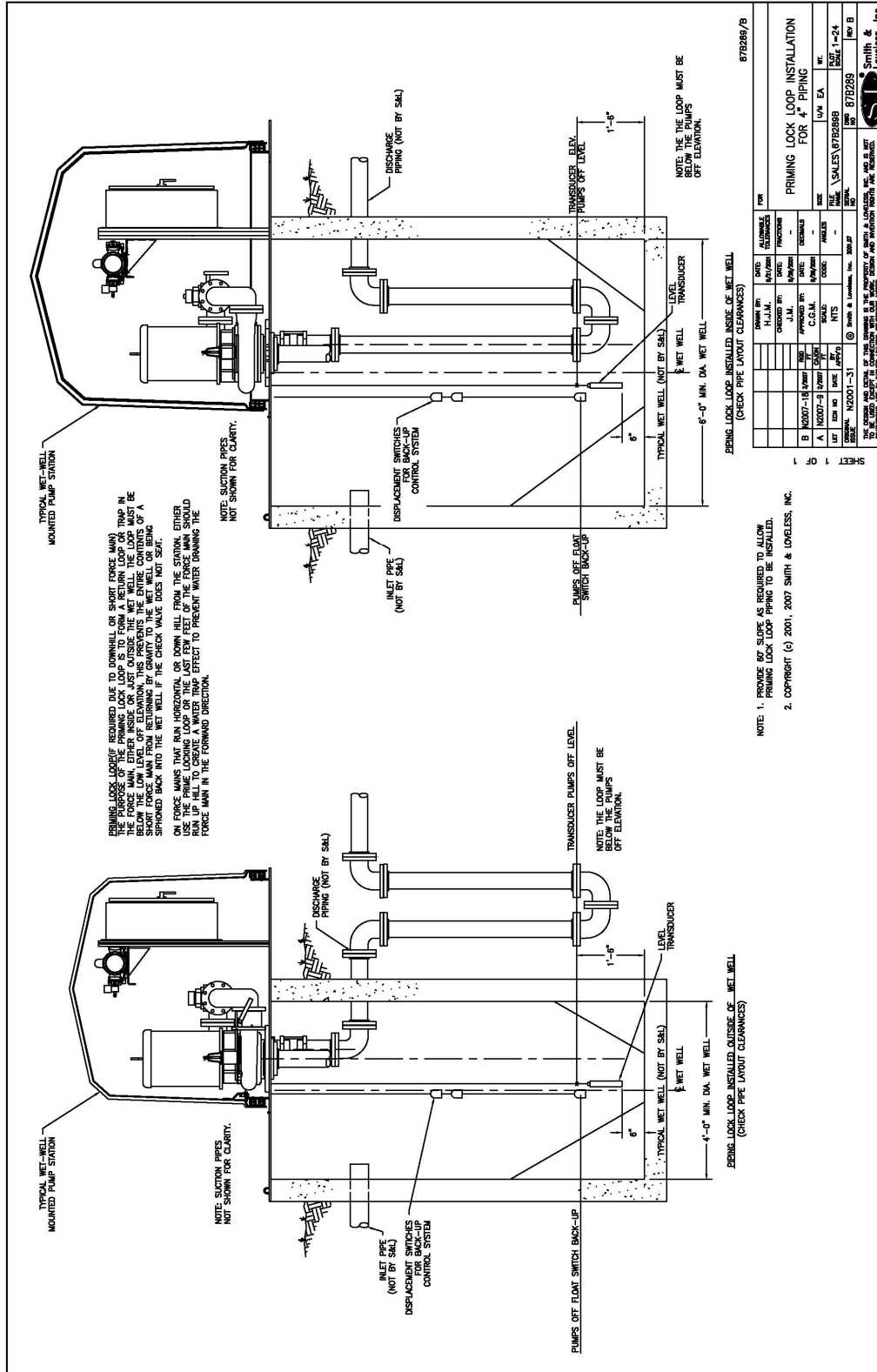
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Vacuum Primed Pump Stations  
Priming Lock Loop Installation  
Drawing 87B289 – 4" Piping  
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DATE	BY	REVISION
11/14/01	SM	ISSUED FOR CONSTRUCTION
07/20/12	SM	REVISED FOR 4" PIPING

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR CONSTRUCTION	11/14/01	SM
2	REVISED FOR 4" PIPING	07/20/12	SM

DATE	BY	REVISION
11/14/01	SM	ISSUED FOR CONSTRUCTION
07/20/12	SM	REVISED FOR 4" PIPING

NOTE: 1. PROVIDE 6% SLOPE AS REQUIRED TO ALLOW PRIMING LOCK LOOP PIPING TO BE INSTALLED.  
2. COPYRIGHT (c) 2001, 2007 SMITH & LOVELESS, INC.

87B289/B

PRIMING LOCK LOOP INSTALLATION FOR 4" PIPING

DATE: 07/20/12  
BY: SALES (87B289) / SM

SCALE: 1/2" = 1'-0"

REV B

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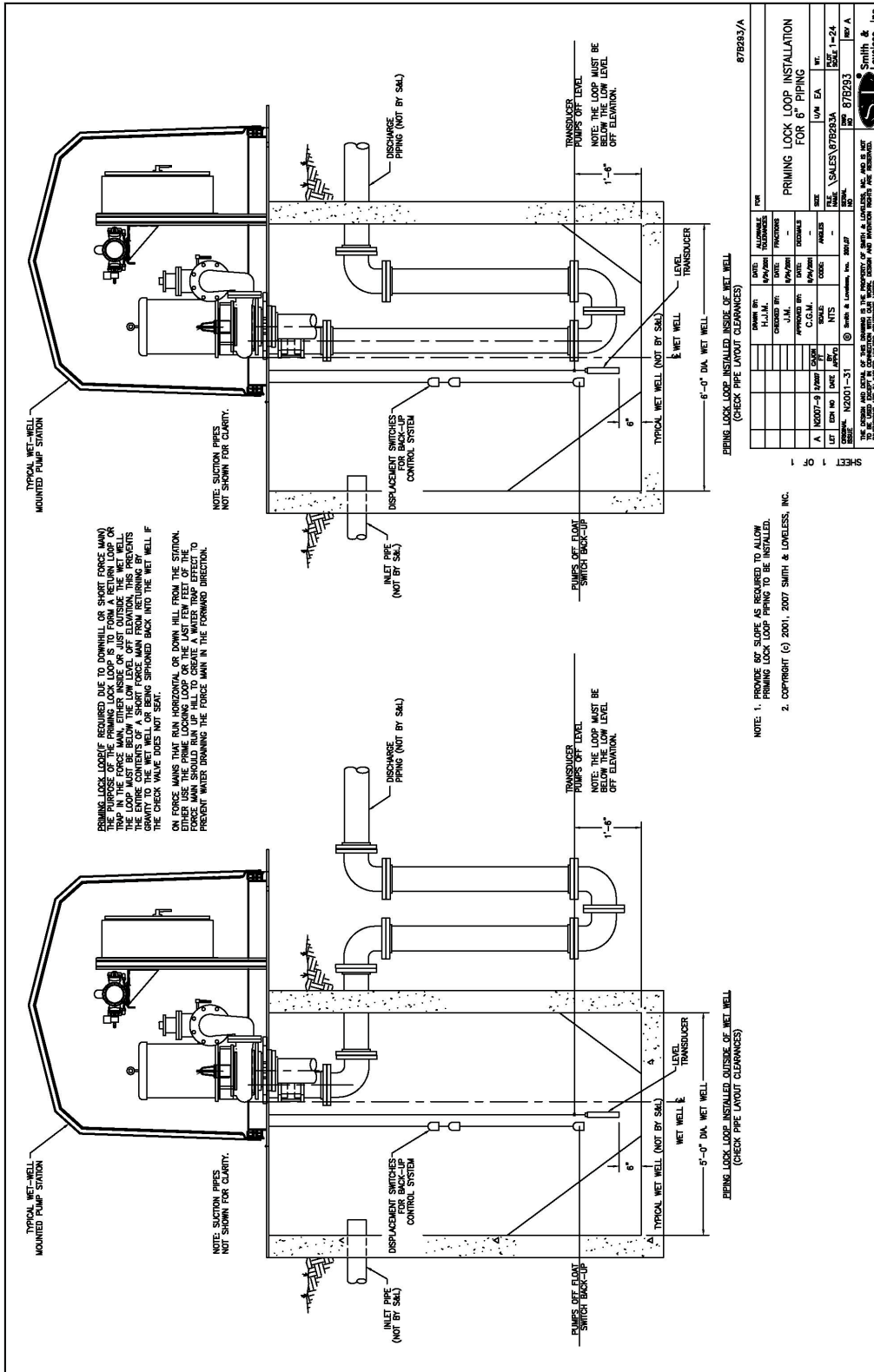
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Vacuum Primed Pump Stations  
Priming Lock Loop Installation  
Drawing 87B293 – 6" Piping  
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PRIMING LOCK LOOP (IF REQUIRED DUE TO DOWNHILL OR SHORT FORCE MAIN) IN THE FORCE MAIN EITHER AS IT JOINS THE FORCE MAIN OR AS IT JOINS THE LOOP MUST BE BELOW THE LOW LEVEL OFF ELEVATION. THIS PREVENTS AIR FROM BEING DRAWN INTO THE FORCE MAIN BY THE CHECK VALVE. THE CHECK VALVE DOES NOT SEAL.

ON FORCE MAINS THAT RUN HORIZONTAL OR DOWN HILL FROM THE STATION, EITHER USE THE PRIME LOCKING LOOP OR THE LAST FEW FEET OF THE FORCE MAIN SHOULD RISE UP HILL TO CREATE A WATER LOCK EFFECT TO PREVENT WATER FROM THE FORCE MAIN AT THE FORWARD STATION.

PRIMING LOCK LOOP INSTALLED INSIDE OF WET WELL (CHECK PIPE LAYOUT CLEARANCES)

PRIMING LOCK LOOP INSTALLED OUTSIDE OF WET WELL (CHECK PIPE LAYOUT CLEARANCES)

- NOTE: 1. PROVIDE 6% SLOPE AS REQUIRED TO ALLOW PRIMING LOCK LOOP PIPING TO BE INSTALLED.
- 2. COPYRIGHT (c) 2001, 2007 SMITH & LOVELESS, INC.

DATE	DATE	DATE	DATE	DATE	DATE
ISSUED BY	APPROVED BY	DESIGNED BY	CHECKED BY	DATE	DESCRIPTION

FOR  
 APPROVED BY: [Signature]  
 C.E.N.  
 DATE: 7/26/12  
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 SHEET NO.: 1-24  
 PROJECT: SALES 87B293A  
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 Smith & Loveless, Inc.

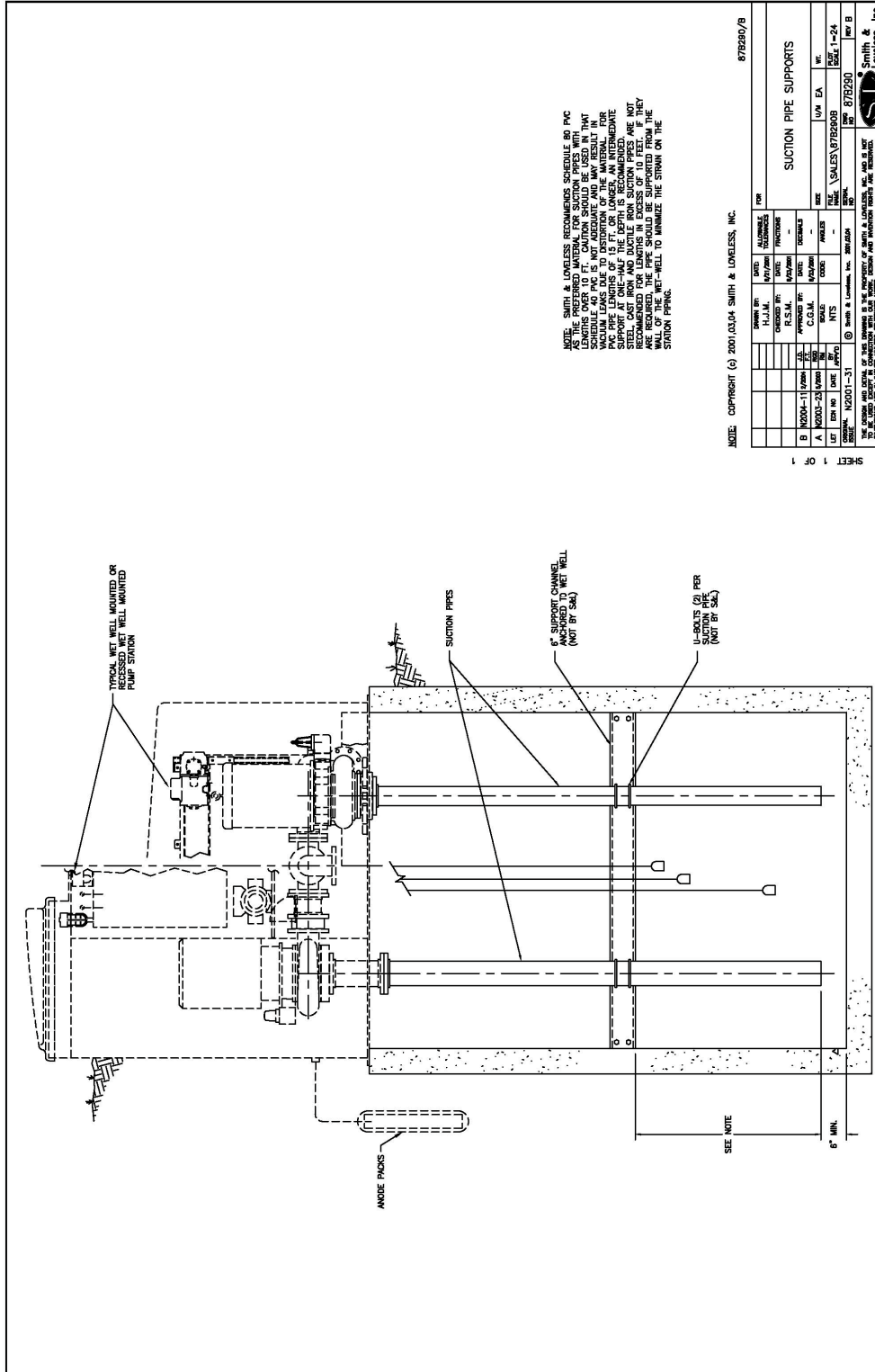
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Vacuum Primed Pump Stations  
Suction Pipe Supports  
Drawing 87B290  
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NOTE: SMITH & LOVELESS RECOMMENDS SCHEDULE 80 PVC SUPPORT CHANNELS TO BE USED IN ALL APPLICATIONS. SCHEDULE 40 PVC IS NOT ADEQUATE AND MAY RESULT IN PVC PIPE LENGTHS OF 15 FT. OR LONGER. AN INTERMEDIATE SUPPORT AT ONE-HALF THE DEPTH IS RECOMMENDED. SUPPORTS ARE NOT RECOMMENDED FOR LENGTHS IN EXCESS OF 10 FEET. IF THEY ARE REQUIRED, THE PIPE SHOULD BE SUPPORTED FROM THE BOTTOM OF THE WET WELL TO MINIMIZE THE STRESS ON THE STATION PIPING.

NOTE: COPYRIGHT (C) 2001, 2004, SMITH & LOVELESS, INC.

REV	DATE	DESCRIPTION
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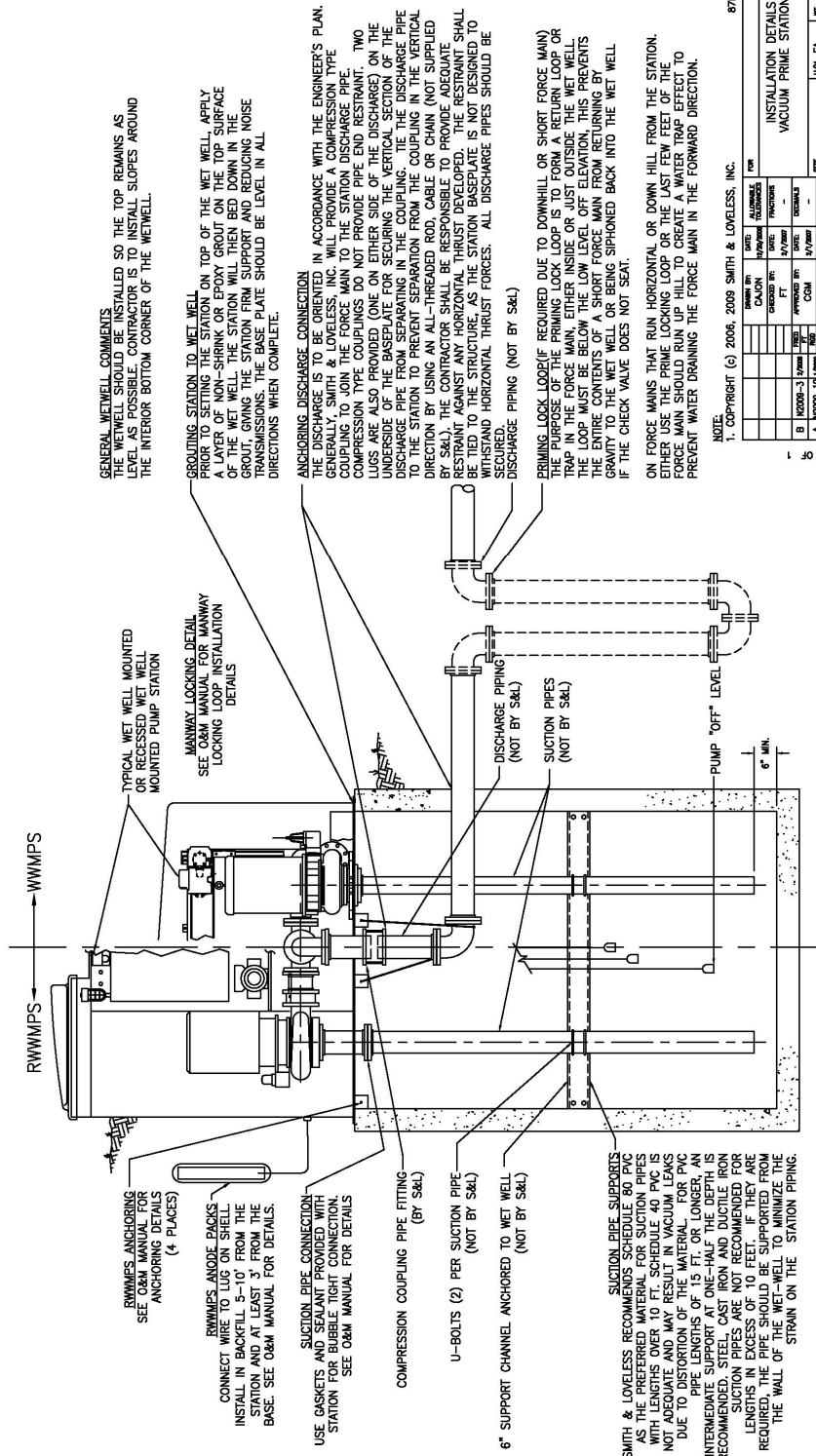


Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump Stations  
Installation Details  
Drawing 87B650  
July, 2012  
Page 1

## INSTALLATION DETAILS



**GENERAL WETWELL COMMENTS**  
THE WETWELL SHOULD BE INSTALLED SO THE TOP REMAINS AS LEVEL AS POSSIBLE. CONTRACTOR IS TO INSTALL SLOPES AROUND THE INTERIOR BOTTOM CORNER OF THE WETWELL.

**GROUTING STATION TO WET WELL**  
PRIOR TO SETTING THE STATION ON TOP OF THE WET WELL, APPLY A LAYER OF NON-SHRINK OR EPOXY GROUT ON THE TOP SURFACE OF THE WET WELL. THE STATION WILL THEN BED DOWN IN THE GROUT. THE STATION SHOULD BE INSTALLED WITH NO VIBRATING TRANSMISSIONS. THE BASE PLATE SHOULD BE LEVEL IN ALL DIRECTIONS WHEN COMPLETE.

**ANCHORING DISCHARGE CONNECTION**  
THE DISCHARGE IS TO BE ORIENTED IN ACCORDANCE WITH THE ENGINEER'S PLAN. GENERALLY, SMITH & LOVELESS, INC. WILL PROVIDE A COMPRESSION TYPE COUPLING TO JOIN THE FORCE MAIN TO THE STATION DISCHARGE PIPE. COMPRESSION TYPE COUPLINGS DO NOT PROVIDE PIPE END RESTRAINT. TWO LUGS ARE ALSO PROVIDED (ONE ON EITHER SIDE OF THE DISCHARGE) ON THE DISCHARGE PIPE FROM SEPARATING THE COUPLING. THE DISCHARGE PIPE TO THE STATION TO PREVENT SEPARATION OF THE COUPLING IN THE VERTICAL DIRECTION BY USING AN ALL-THREADED ROD, CABLE OR CHAIN (NOT SUPPLIED BY S&L). THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADEQUATE RESTRAINT AGAINST ANY HORIZONTAL THRUST DEVELOPED. THE RESTRAINT SHALL BE TIED TO THE STRUCTURE, AS THE STATION BASEPLATE IS NOT DESIGNED TO WITHSTAND HORIZONTAL THRUST FORCES. ALL DISCHARGE PIPES SHOULD BE SECURED.

**DISCHARGE PIPING (NOT BY S&L)**  
PRIMING LOCK LOOP(S) REQUIRED DUE TO DOWNHILL OR SHORT FORCE MAIN. THE PURPOSE OF THE PRIMING LOCK LOOP IS TO FORM A RETURN LOOP OR TRAP IN THE FORCE MAIN, EITHER INSIDE OR JUST OUTSIDE THE WET WELL. THE LOOP MUST BE BELOW THE LOW LEVEL OFF ELEVATION. THIS PREVENTS THE ENTIRE CONTENTS OF A SHORT FORCE MAIN FROM RETURNING BY GRAVITY TO THE WET WELL OR BEING SIPHONED BACK INTO THE WET WELL IF THE CHECK VALVE DOES NOT SEAT.

**ON FORCE MAINS THAT RUN HORIZONTAL OR DOWN HILL FROM THE STATION, EITHER USE THE PRIME LOCKING LOOP OR THE LAST FEW FEET OF THE FORCE MAIN SHOULD RUN UP HILL TO CREATE A WATER TRAP EFFECT TO PREVENT WATER DRAINING THE FORCE MAIN IN THE FORWARD DIRECTION.**

1. COPYRIGHT (c) 2006, 2009 SMITH & LOVELESS, INC. 87B650/79

DATE	DESCRIPTION	BY	CHKD

INSTALLATION DETAILS  
VACUUM PRIME STATIONS

NO.	DESCRIPTION	DATE	BY	CHKD
B				
A				

SCALE: 1"=30'

DATE: 7/12/12

BY: J. VALES

CHKD: J. VALES

PROJECT: 87B650

REV: B

SMITH & LOVELESS, INC.

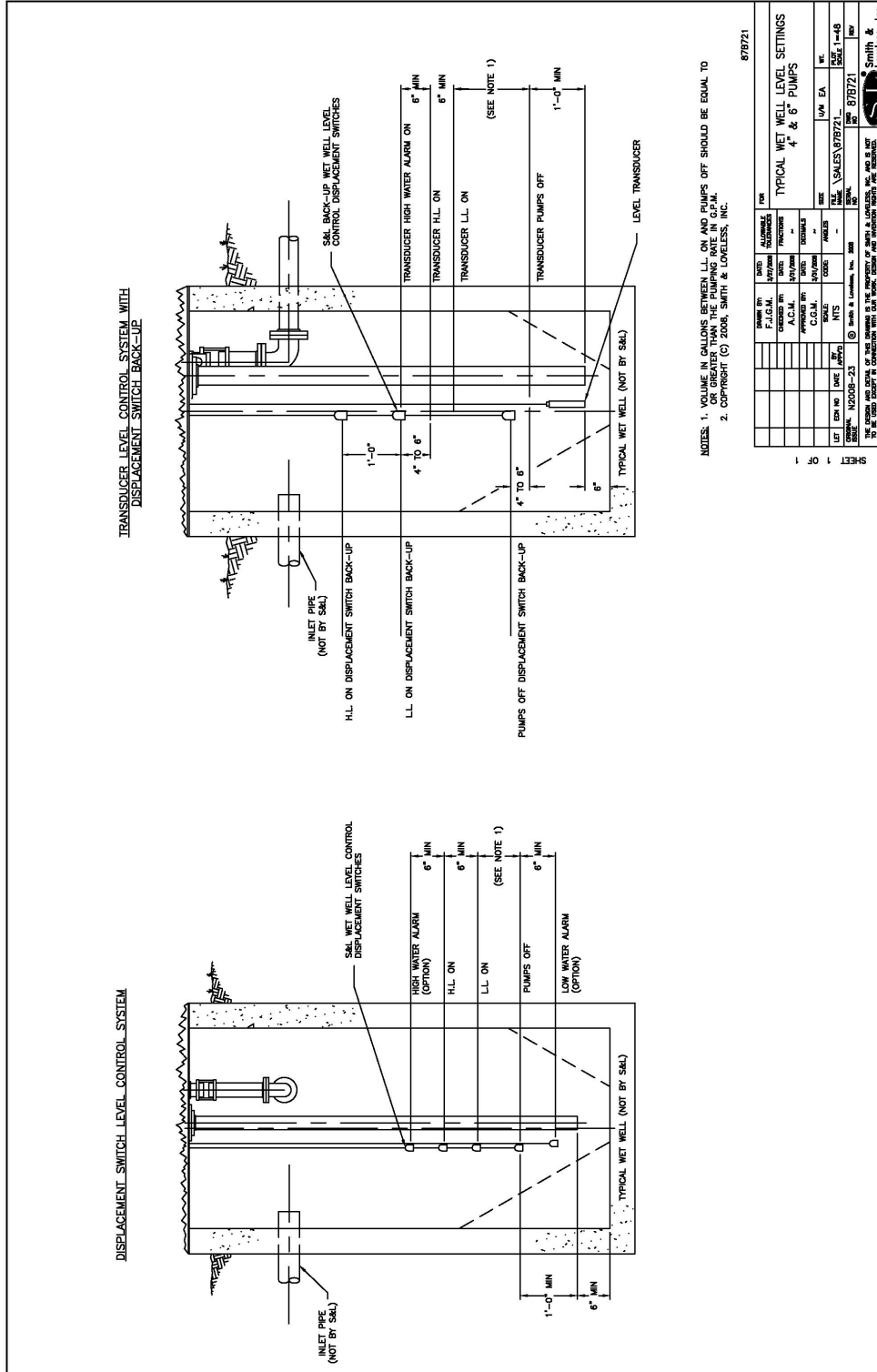
# ENGINEERING DATA



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14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump Stations  
Typical Wet Well Level Settings  
Drawing 87B721  
4" and 6" Pumps  
July, 2012  
Page 1



NOTES: 1. VOLUME IN GALLONS BETWEEN L.L. ON AND PUMPS OFF SHOULD BE EQUAL TO  
OR GREATER THAN THE PUMPING RATE IN G.P.M.  
2. COPYRIGHT (C) 2008, SMITH & LOVELESS, INC.

87B721

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TYPICAL WET WELL LEVEL SETTINGS  
4" & 6" PUMPS

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TYPICAL WET WELL LEVEL SETTINGS  
4" & 6" PUMPS

SALES 87B721

1-48

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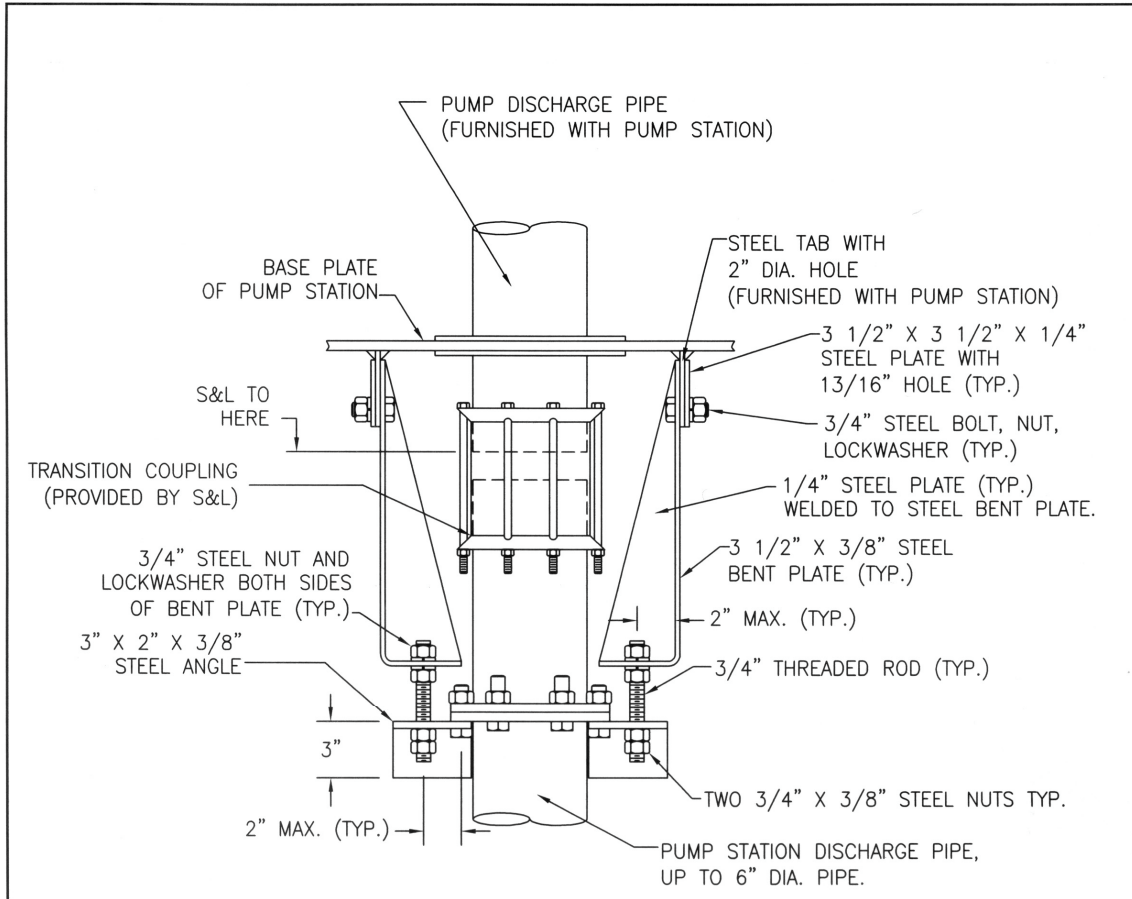
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Vacuum Primed Pump Stations  
Recommended Pipe Restraint  
Detail (Vertical Discharge Pipe)  
Drawing 87A622  
July, 2012  
Page 1



**NOTES:**

1. ALL COMPONENTS ARE PROVIDED BY OTHERS UNLESS NOTED ON DRAWING.
2. RESTRAINT IS INTENDED FOR USE WITH DISCHARGE PRESSURES LESS THAN 500 FT. (216.5 PSI) WITH MAXIMUM 6" DIAMETER VERTICAL DISCHARGE PIPE.
3. THIS DETAIL IS INTENDED FOR USE ONLY ON SMITH AND LOVELESS INC. WET WELL MOUNTED PUMP STATIONS.

SHEET 1 OF 1

87A622

DRAWN BY: CAJON		DATE: 3/23/2006	ALLOWABLE TOLERANCES	RECOMMENDED PIPE RESTRAINT DETAIL (FOR VERTICAL DISCHARGE PIPE)		
CHECKED BY: ACM		DATE: 3/23/2006	FRACTIONS	SIZE	U/M EA	WT.
APPROVED BY: FT		DATE: 3/24/2006	DECIMALS	FILE NAME \\FIELD\87A622_	PLOT SCALE 1=8	
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				SERIAL NO	DWG NO 87A622	REV
				ORIGINAL ISSUE	N2006-29	
				© Smith & Loveless, Inc. 2006		

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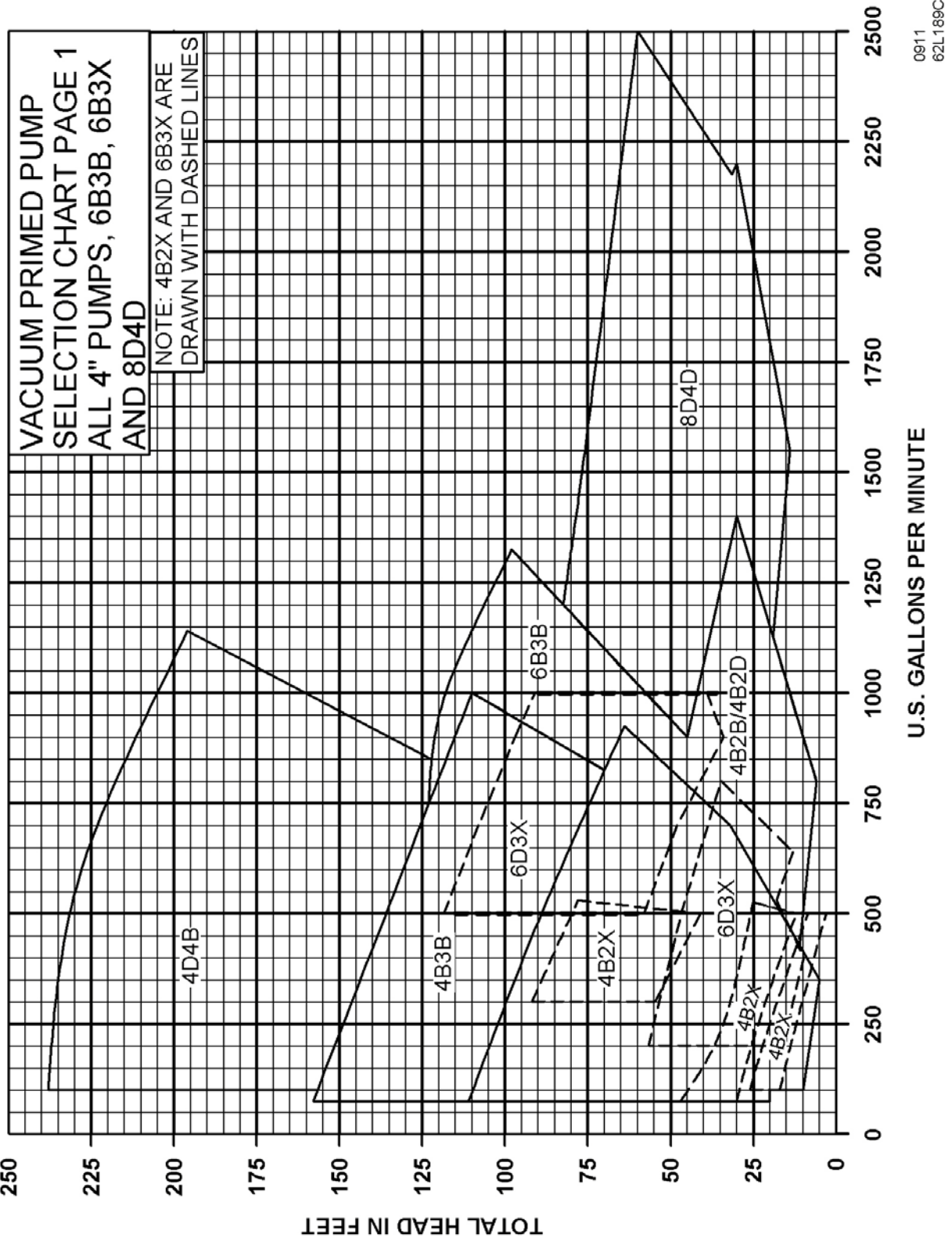
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Vacuum Primed Pump  
Selection Chart  
Drawing 62L189 – 4" Pumps  
6B3B / 6B3X / 8D4D  
July, 2012  
Page 1



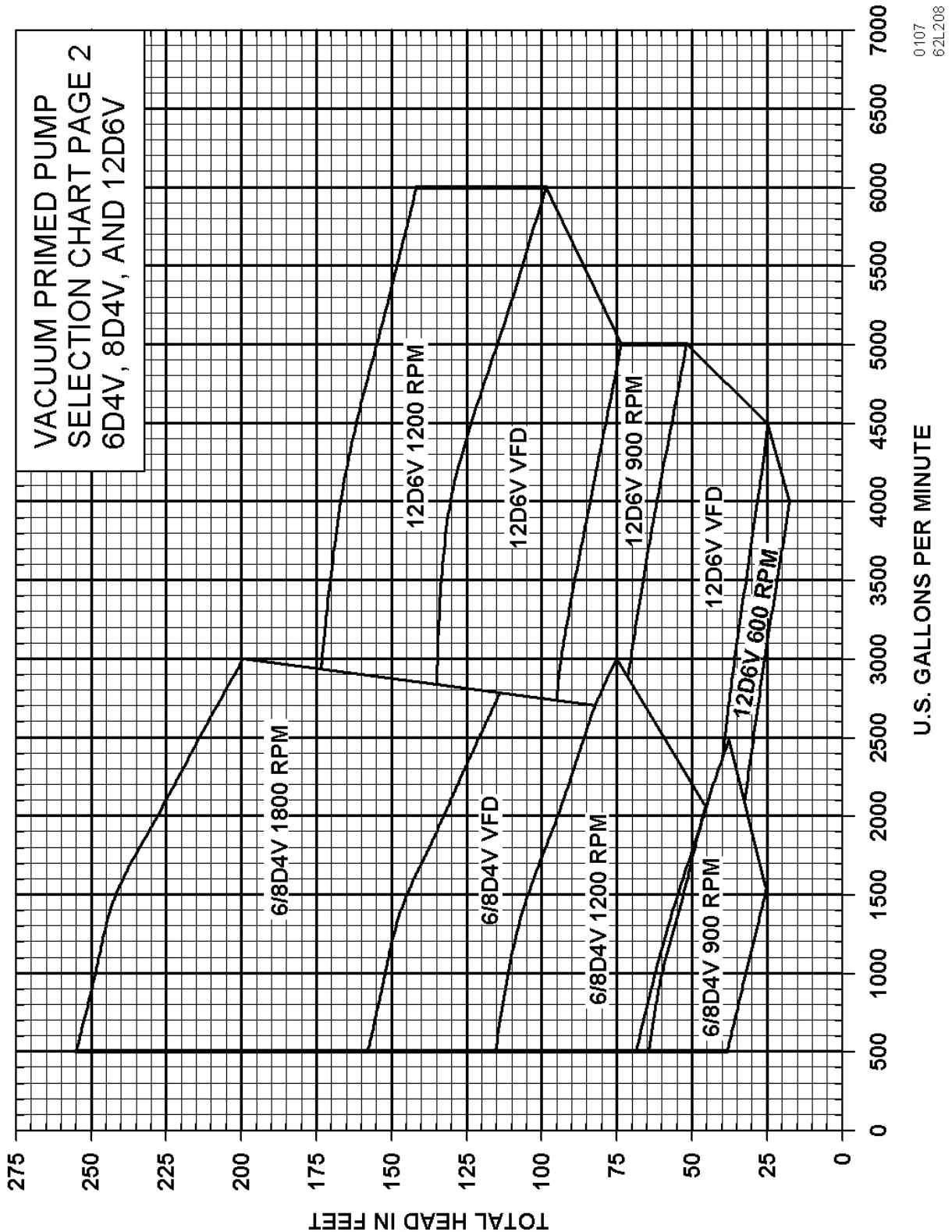
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Vacuum Primed Pump  
Selection Chart  
Drawing 62L208  
6D4V / 8D4V / 12D6V  
March, 2011  
Page 2







## SUCTION LINE CONSIDERATIONS 8D4V & 12D6V PUMPS

### MAXIMIZING SUCTION LIFT CAPABILITY

In addition to providing well supported and braced, leak-tight suction lines for vacuum primed pumps (reference Drawing 87B290 or 87B650), it is equally important to provide good hydraulic conditions to insure the optimum suction lift performance.

Suction lines should be as large in diameter as practical without reducing the velocity below the minimum for carrying solids, usually 2.0 fps. Refer to the recommended ranges on the Smith & Loveless pump curves as a guideline. Avoid unnecessary bends or ells, and horizontal runs of pipe, to minimize friction losses. Friction from any piping other than the straight downward run shown in the catalog drawings must be deducted from the allowable suction lift.

For 4" and 6" pumps, the bottom of the suction pipe should be approximately 6" above the floor of the wet well and a minimum of 12" below the "Off" level setting of the controls. For 8" and 12" pumps, refer to the following section, addressing them specifically. When using these distances, a bell or flare inlet is not necessary. A foot valve is not recommended for normal applications of vacuum primed pumps.

Liquid temperatures above about 85 degrees F. will cause a reduction in allowable suction lift due to the increase in vapor pressure. Consult the Factory in these cases.

### DERATING FOR ALTITUDE

Most Smith & Loveless vacuum primed pump curves show the maximum allowable static suction lift, either as a note (Maximum Suction Lift at M.S.L. - 20') or as a family of curves delineating the maximum, if below 20'.

These values are based atmospheric pressure at Mean Sea Level and on the vertical distance measured from the "Off" control level setting in the wet well up to the station baseplate or top of the wet well where the station sits.

The maximum allowable static suction lift must be derated for altitude at higher elevations. For every 1000' of altitude, it is necessary to derate the allowable static suction lift by 1.0', to account for the decrease in atmospheric pressure. Therefore, a pump that is capable

of 20' of static suction lift at sea level is only good for 15' at 5000' elevation.

### 8D4V / 12D6V PUMPS

The suction pipe sizing and suction lift ratings of the 8D4V and 12D6V pumps are determined differently than for other Smith & Loveless vacuum primed pumps. In addition, some of the suction piping dimensions are different, all due to the high flows involved with these bigger pumps.

The chart with Max and Min flows on Page 3 will assist in selection of possible suction pipe sizes, based on the design flow rate of the pump (or the single pump run-out flow rate for multiple pump installations). It would be good to consider something larger than the absolute minimum allowable size, to keep losses down and suction lift up. This chart also will give the proper clearance distance from the bottom of the suction pipe to the bottom of the wet well ("C") to provide good solids collection, and the minimum submergence of the suction inlet ("S") to avoid vortexing and drawing in air. These numbers are based on Hydraulic Institute recommendations.

To determine the maximum static suction lift (the distance from the top of the wet well or baseplate of the station down to the "Low Level Off" elevation), use the appropriate chart on Page 4. The bottom chart is only for the 1760 RPM 8D4V pump, which has a flow conditioner. The top chart is for the other 8D4V pump speeds and all of the 12D6V pumps. These charts take into account the suction line friction, velocity and entry losses.

Find the intersection between the plotted line for the suction size selected and the vertical line for the maximum flow rate expected through the pump. From this intersection, read the maximum static suction lift horizontally from the scale on the left. Note that large suction lines allow more suction lift. Adjust your suction pipe selection if necessary.

The maximum static suction lift is based on using Schedule 80 PVC suction lines and atmospheric pressure at sea level. For higher altitudes, derate the maximum static suction lift by 1.0' per 1000 feet above sea level.

# ENGINEERING DATA



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Suction Line Considerations  
8D4V / 12D6V Pumps  
July, 2012  
Page 2

**EXAMPLE:** For 3000 GPM, using the 8D4V pump at 1170 RPM, at 2050' elevation, the chart on Page 2 allows 14" and larger suction lines. Try the 14" first. From the top chart on Page 3, a 14" suction at 3000 GPM is good for 16.3' SSL. Derating that by 1'/1000 ft. altitude, we get 14.3' Max. If we go to 16", the chart allows 17.4', which, after derating, leaves 15.4'. Doing the same with 18" pipe results in 18.0' - 2' = 16.0' Max. and 20" gives us 18.4' - 2' = 16.4'. We see that larger suctions allow more suction lift, but at a diminishing rate. Do not skimp on suction size. Select a suction pipe size that gives more than the required SSL, but is still economical.

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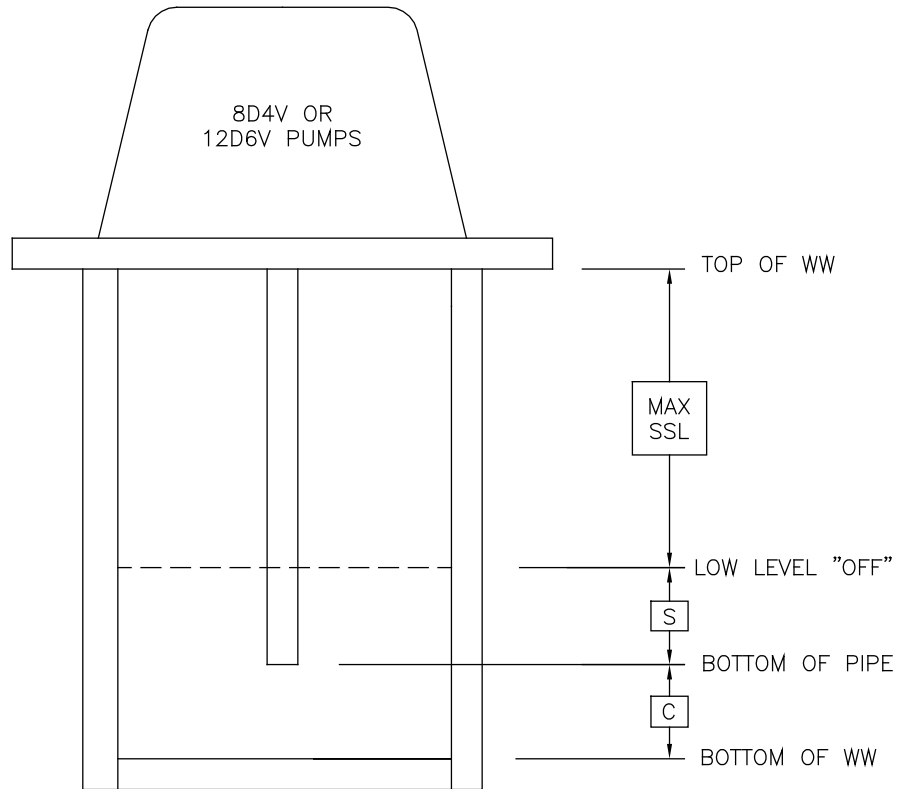


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Suction Line Considerations  
8D4V & 12D6V Pumps  
January, 2011  
Page 3

## SUCTION LINE CONSIDERATIONS – 8D4V & 12D6V PUMPS



SUCTION PIPE DIA (in)	MAX FLOW (gpm)	MIN FLOW (gpm)	CLEARANCE "C" (in)	SUBMERGENCE "S" (in)
8	1200	315	6	16
10	1800	500	7	19
12	2400	700	8	22
14	3200	960	8	25
16	4100	1250	9	29
18	5000	1600	10	32
20	6200	2000	11	36

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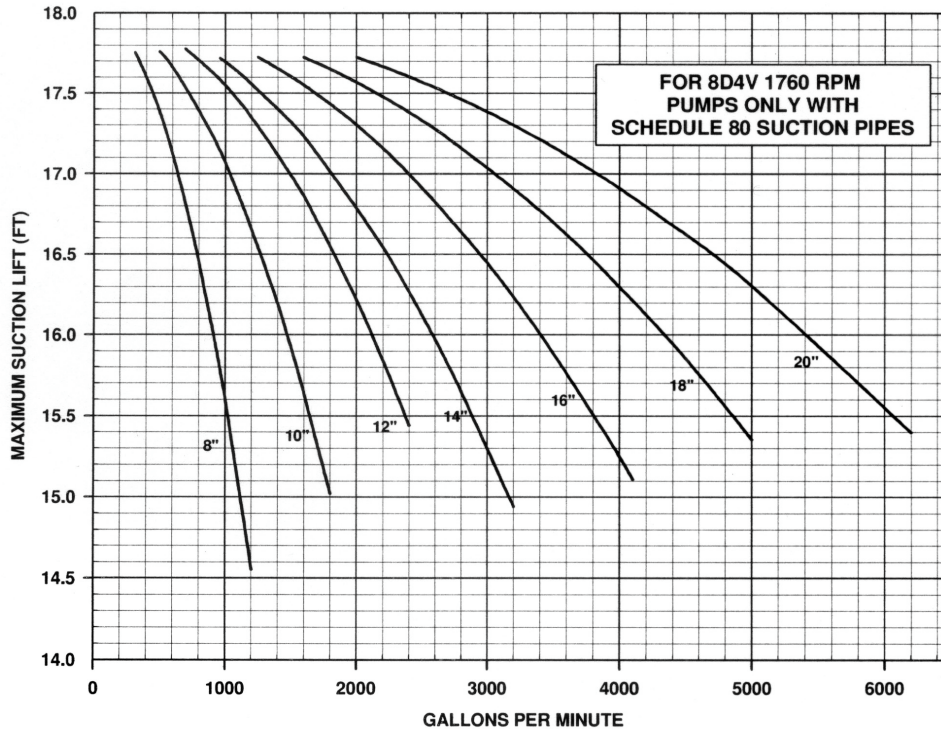
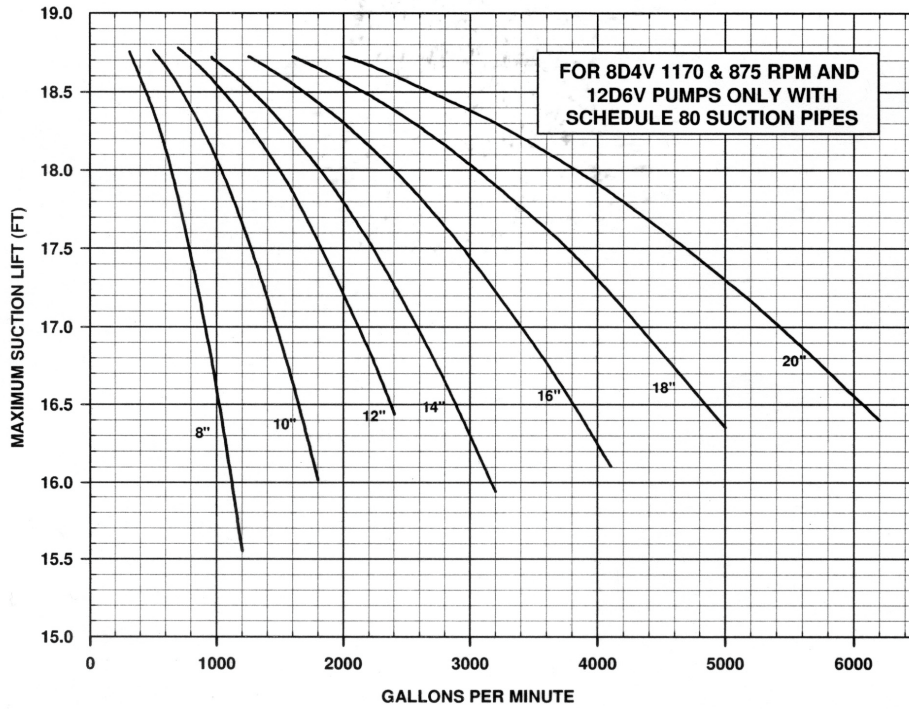


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Suction Lift Limits  
8D4V & 12D6V Pumps  
January, 2011  
Page 3

## SUCTION LIFT LIMITS - 8D4V & 12D6V PUMPS



# ENGINEERING DATA



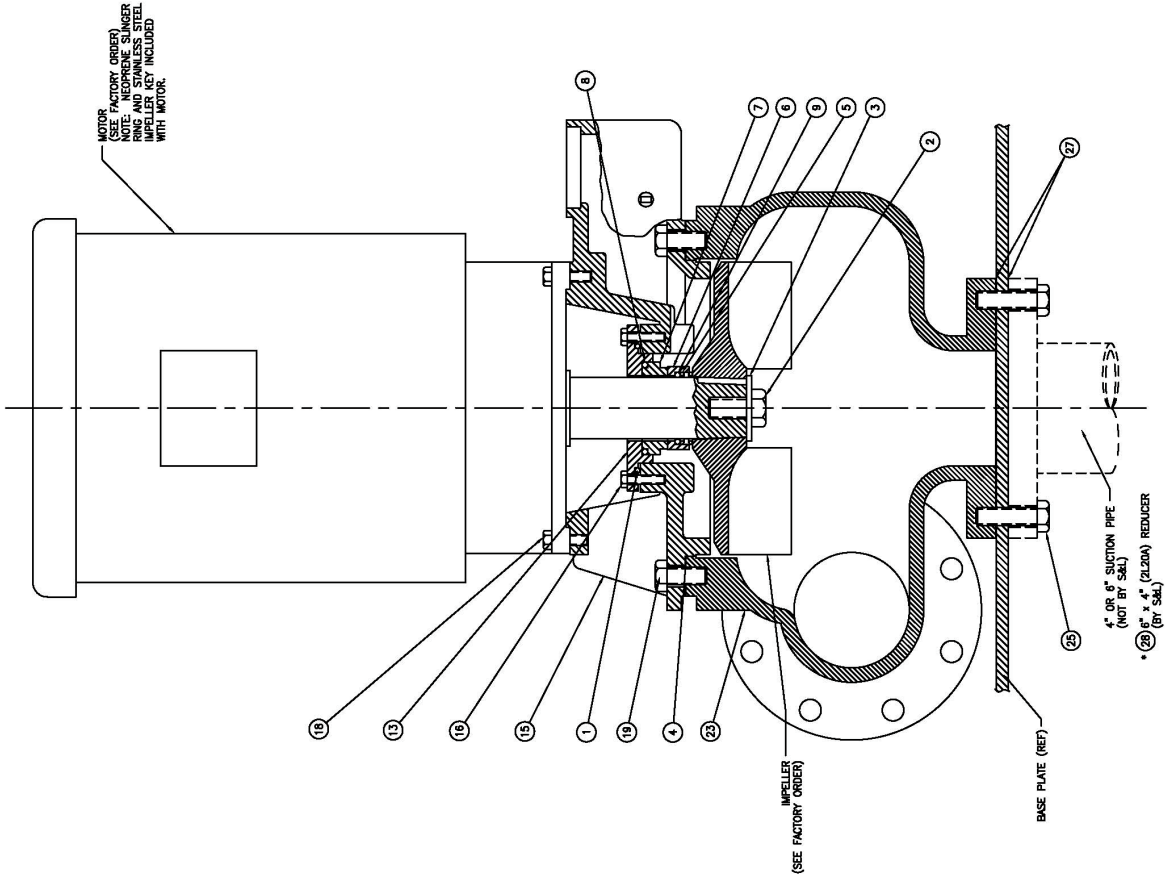
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Pump Assembly Drawing  
4B2C Turbo Pump  
Drawing 87B455  
July, 2012

BILL OF MATERIAL					Wk. Ed.
Item Qty	UM	Part Number	Rev. Matd	Description	Size
1	EA	60A10		SEAL HOLDER GASKET QUAD RING	
1	EA	60A12		IMPELLER BOLT	
3	EA	60A20		IMPELLER WASHER	
4	EA	60A26		VOLUTE GASKET	
5	EA	60A30		SPRING	
6	EA	60A32		ROTATING CERAMIC SEAL	
7	EA	60A36		STATIONARY CARBON SEAL	
8	EA	60A38		QUAD RING	
9	EA	60A39		7" RING	
13	EA	67B2		SEAL HOLDER	
15	EA	60B16SA		MOTOR ADAPTER MODIFICATION	4B2C
16	EA	6L38BC		CAPSCREW, SS	5/16"-18 X 1"
18	EA	6L20DE		CAPSCREW	3/8"-16 X 1 1/2"
19	EA	6L20HD		CAPSCREW	5/8"-11 X 1 1/4"
25	EA	6L26HJ		CAPSCREW	5/8"-11 X 2 1/2"
27	EA	11L1A		FLANGE GASKET	4"
28	EA	ZL20A		REDUCER	8" X 4"

CW ASSY	
Item Qty	Description
23	EA 60D230 VOLUTE - STANDARD
23	EA 60D231 VOLUTE - STANDARD
23	EA 60D231 CCW ASSY
23	EA 60D231 VOLUTE - STANDARD



NOTE:  
 1. NEOPRENE SLINGER RING AND STAINLESS STEEL IMPELLER KEY INCLUDED WITH MOTOR.  
 \*2. FURNISHED ON 6" SUCTIONS ONLY.  
 3. COPYRIGHT (C) 2004, 2006, 2007 SMITH & LOVELESS, INC.

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LET FOR INFO DATE: 6/1/04 ISSUE: N2004-28 REV: 2	SCALE: 1=2.887	SHEET 1 OF 1
SMITH & LOVELESS, INC. 2890 W. 31st St. Lenexa, KS 66215-1284	87B455	REV C

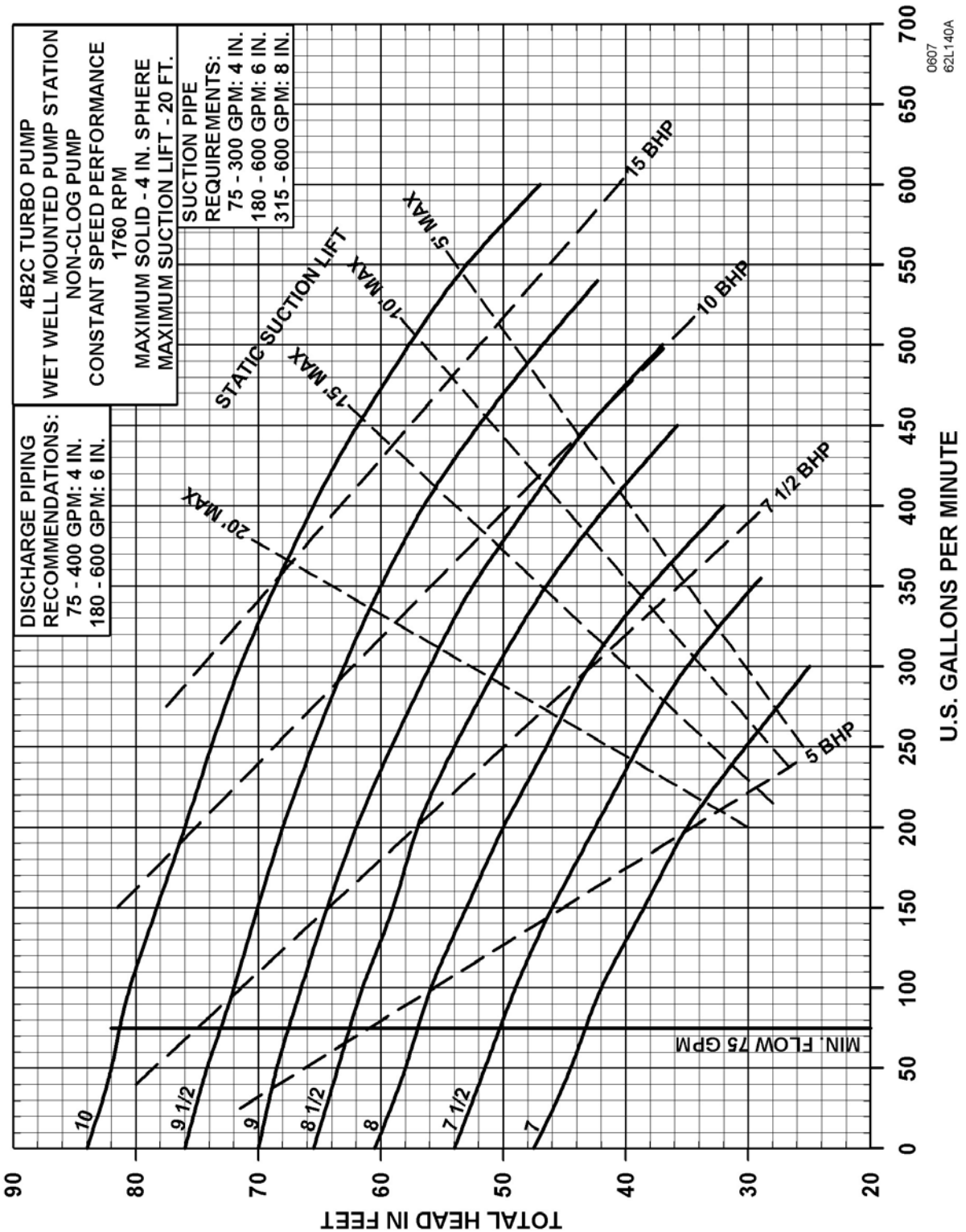
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Vacuum Primed Pump  
Performance Curve 62L140  
Constant Speed  
Non-Clog Pump  
4B2C Turbo Pump  
1760 RPM  
July, 2012



0607  
62L140A

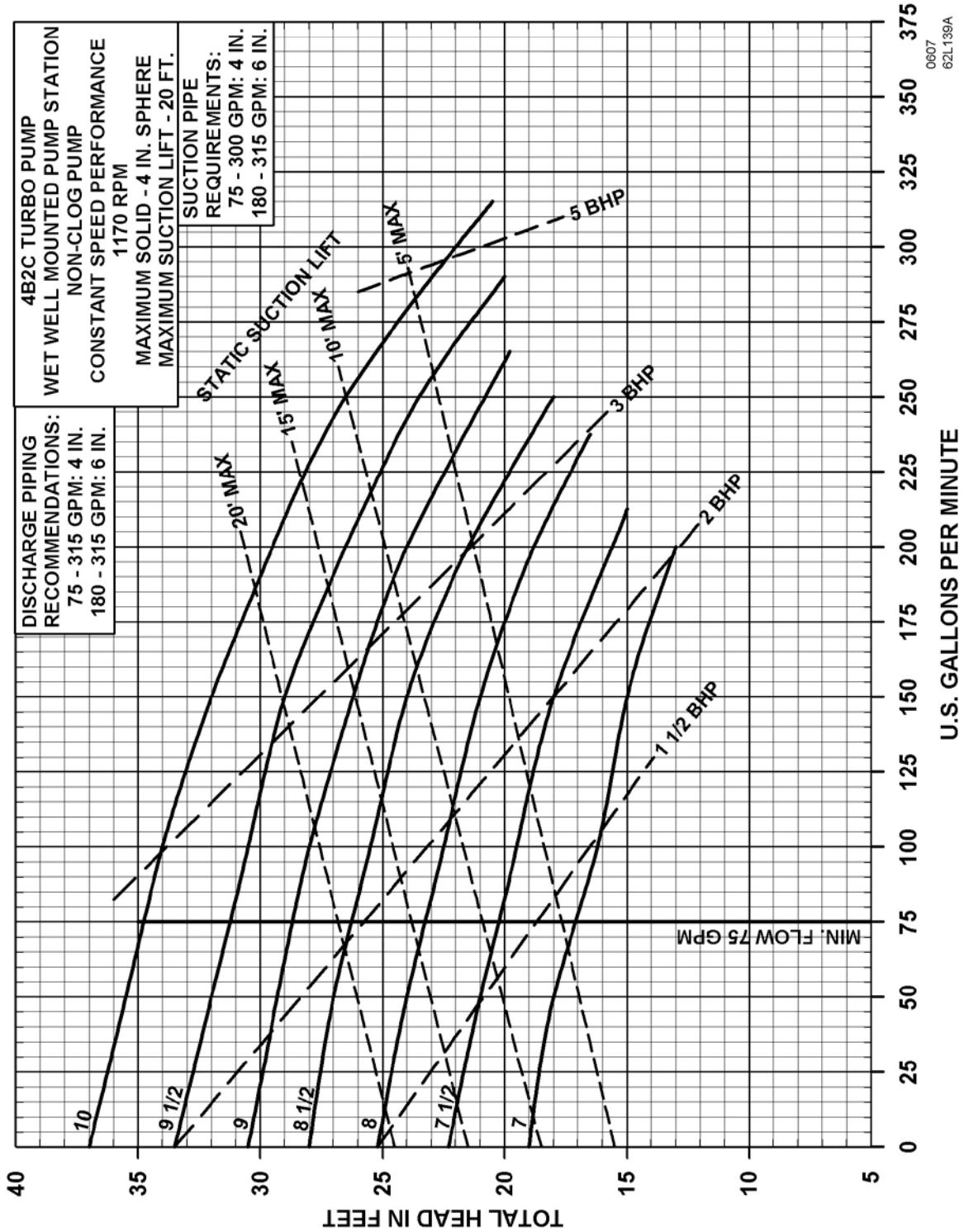
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L139  
Constant Speed  
4B2C Turbo Pump  
1170 RPM  
July, 2012



# ENGINEERING DATA



Smith & Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

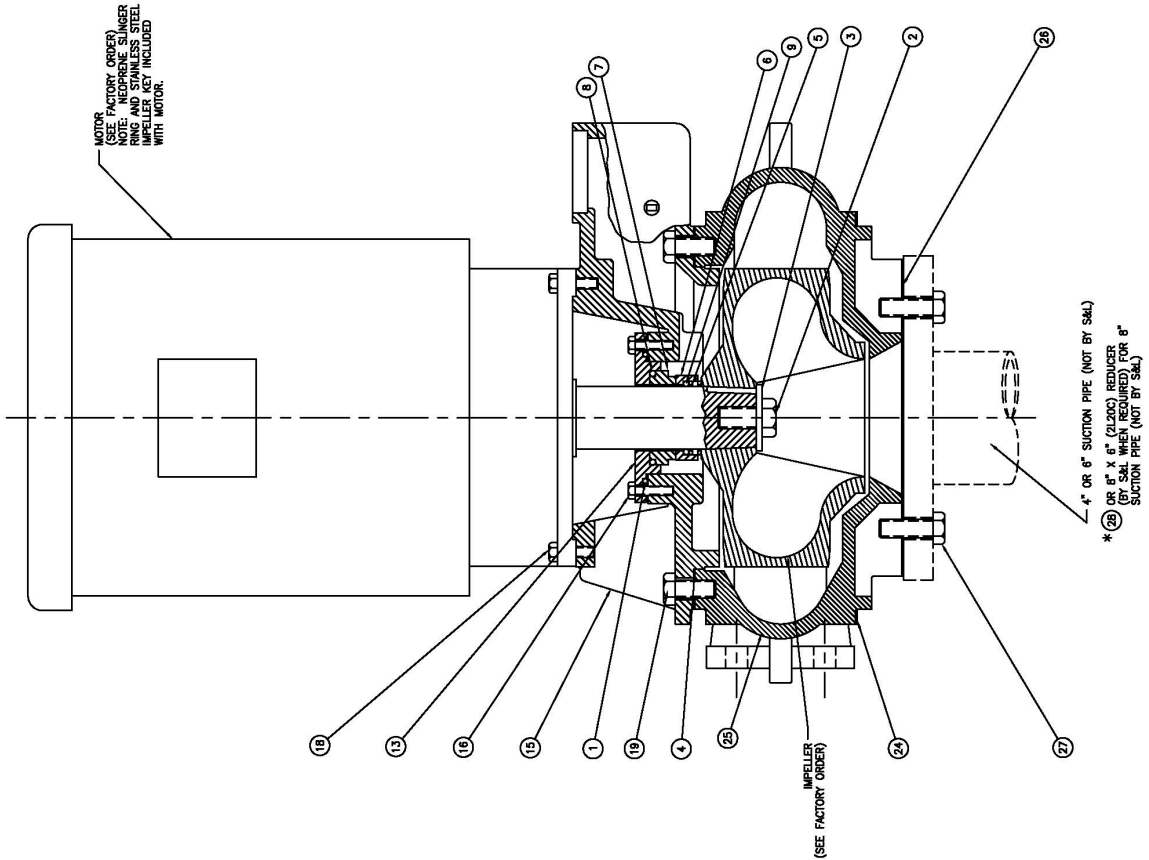
Pump Assembly Drawing  
4B2B / 4B2D / 4B2X  
Drawing 87B453  
July, 2012

Item	Qty	UM	Part Number	Raw Matl	Description	Size	Wt. Ea
1	1	EA	80A110		SEAL HOLDER GASKET QUAD RING		
2	1	EA	80A12		IMPELLER BOLT		
3	1	EA	80A20		IMPELLER WASHER		
4	1	EA	80A26		VOLUTE GASKET		
5	1	EA	80A30		SPRING		
6	1	EA	80A32		ROTATING CERAMIC SEAL		
7	1	EA	80A38		STATIONARY CARBON SEAL		
8	1	EA	80A38		QUAD RING		
9	1	EA	80A39		"O" RING		
13	1	EA	87B2		SEAL HOLDER		
15	1	EA	60E185A		MOTOR ADAPTER MODIFICATION		
16	6	EA	6L598C		CAPSCREW, SS	5/16"-18 X 1"	
18	4	EA	6L200C		CAPSCREW	3/8"-16 X 1"	
19	4	EA	6L20HD		CAPSCREW	5/8"-11 X 1 1/4"	
24	1	EA	80A108		BASE SEAL GASKET		

4" SUCTION PUMP							
25A	1	EA	87D308A		INTEGRAL VOLUTE---COW	4"	
25B	1	EA	87D308B		INTEGRAL VOLUTE---COW	4"	
26	1	EA	11L1A		GASKET	4"	
27	8	EA	6L20HF		CAPSCREW	5/8"-11 X 1 3/4"	

6" SUCTION PUMP							
25A	1	EA	87D308A		INTEGRAL VOLUTE---COW	6"	
25B	1	EA	87D308B		INTEGRAL VOLUTE---COW	6"	
26	1	EA	11L1C		GASKET	6"	
27	8	EA	6L20G		CAPSCREW	3/4"-10 X 2"	

8" SUCTION PUMP							
25A	1	EA	87D308A		INTEGRAL VOLUTE---COW	6"	
25B	1	EA	87D308B		INTEGRAL VOLUTE---COW	6"	
26	1	EA	11L1C		GASKET	6"	
27	8	EA	6L20JF		CAPSCREW	3/4"-10 X 1 3/4"	
28	1	EA	2L20C		REDUCER	8" X 6"	



NOTES:  
1. COPYRIGHT (C) 2004, 2006, 2007 SMITH & LOVELESS, INC.  
2. SPECIFY CW OR CCW ON INTEGRAL VOLUTE.

DATE:	1/27/04	FOR:	87B453/C
DESIGNED BY:	JRB	ALLOWABLE TOLERANCES:	
CHECKED BY:	ROD	FUNCTIONS:	
APPROVED BY:	MS	REVISIONS:	
DATE:	1/27/04	SIZE:	U/A EA
FILE NO.:	87B453	SCALE:	1=2.687
DATE:	1/27/04	NO.:	089 87B453
DATE:	1/27/04	REV.:	001

SMITH & LOVELESS, INC. 14040 WEST SANTA FE TRAIL DRIVE, LENEXA, KANSAS 66215-1284



# ENGINEERING DATA



Smith & Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

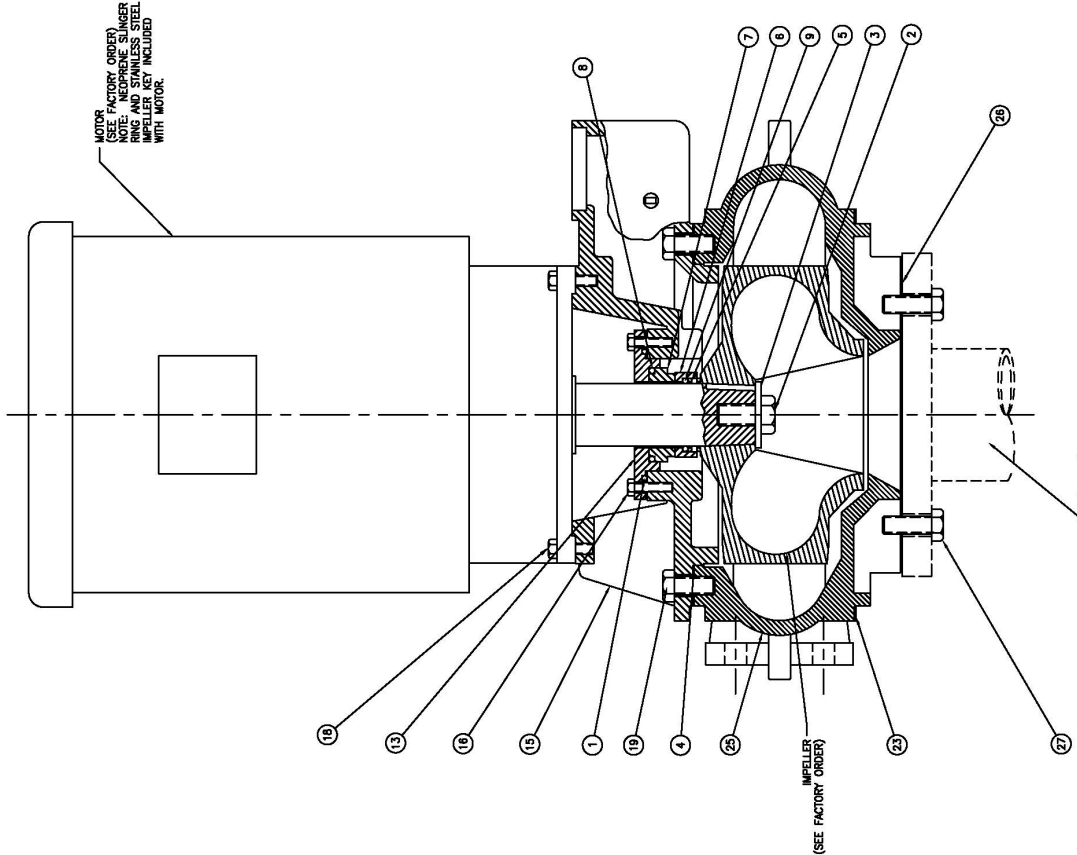
Pump Assembly Drawing  
4C2B / 4C2D / 4C2X  
Drawing 87B454  
July, 2012

BILL OF MATERIAL			
Item Qty	UM	Part Number	Description
1	EA	60A111	SEAL HOLDER GASKET QUAD RING
2	EA	60A12	IMPELLER BOLT
3	EA	60A20	IMPELLER WASHER
4	EA	60A28	VOLUTE GASKET
5	EA	60A31	SPRING
6	EA	60A33	ROTATING CERAMIC SEAL
7	EA	60A37	STATIONARY CARBON SEAL
8	EA	60A40	QUAD RING
9	EA	60A41	"O" RING
13	EA	67F19	SEAL HOLDER
15	EA	60R165B	MOTOR ADAPTER MODIFICATION
16	EA	6L598C	CAPSCREW SS
18	EA	6L200C	CAPSCREW
19	EA	6L20HD	CAPSCREW
23	EA	60A108	BASE SEAL GASKET

4" SUCTION PUMP			
25A	EA	67D309A	INTERNAL VOLUTE--CCW
25B	EA	67D309B	INTERNAL VOLUTE--CW
26	EA	1111A	GASKET
27	EA	6L20HF	CAPSCREW

6" SUCTION PUMP			
25A	EA	67D309A	INTERNAL VOLUTE--CCW
25B	EA	67D309B	INTERNAL VOLUTE--CW
26	EA	1111C	GASKET
27	EA	6L20G	CAPSCREW

8" SUCTION PUMP			
25A	EA	67D309A	INTERNAL VOLUTE--CCW
25B	EA	67D309B	INTERNAL VOLUTE--CW
26	EA	1111C	GASKET
27	EA	6L20JF	CAPSCREW
28	EA	2L20C	REDUCER
29	EA	1111D	GASKET
30	EA	6L20JN	CAPSCREW
31	EA	6L20M	NUT



NOTES:  
1. 4C2B/4C2D/4C2X PUMPS ARE ONLY USED WITH 20 AND 25 HP, 1750 RPM, "C" SHFT MOTORS  
2. COPYRIGHT (C) 2004, 2006, 2007 SMITH & LOVELESS, INC.  
3. SPECIFY CW OR CCW ON INTERNAL VOLUTE.

1/2" OR 6" SUCTION PIPE (NOT BY S&L)  
\*28 29 30 31 REDUCER (BY S&L) (200) (NOT BY S&L)  
SUCTION PIPE (NOT BY S&L)

DATE	BY	DESCRIPTION
10/20/07	JW	DESIGN
10/20/07	JW	ISSUED FOR FABRICATION
10/20/07	JW	ISSUED FOR TESTING
10/20/07	JW	ISSUED FOR SHIPMENT

DESIGNED BY	JW	CHECKED BY	JW
DRAWN BY	JW	APPROVED BY	JW
SCALE	AS SHOWN	DATE	10/20/07
SIZE	A	WORKSHEET NO.	1
QUANTITY	1	REV.	1
DESCRIPTION	PUMP ASSEMBLY 4C2B/4C2D/4C2X		
DATE	10/20/07	BY	JW
SCALE	AS SHOWN	WORKSHEET NO.	1
QUANTITY	1	REV.	1
DESCRIPTION	PUMP ASSEMBLY 4C2B/4C2D/4C2X		
DATE	10/20/07	BY	JW
SCALE	AS SHOWN	WORKSHEET NO.	1
QUANTITY	1	REV.	1
DESCRIPTION	PUMP ASSEMBLY 4C2B/4C2D/4C2X		

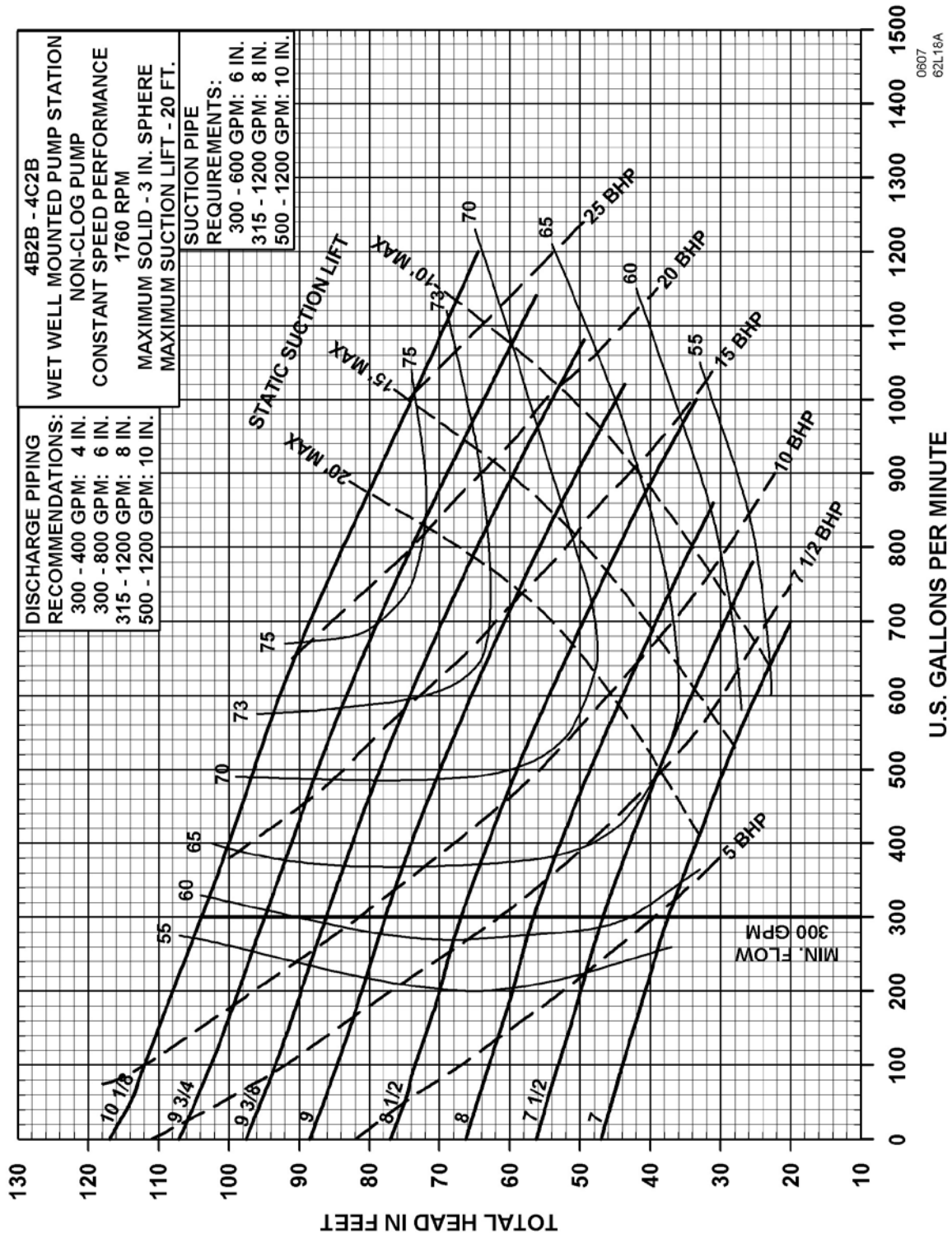
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L18  
Constant Speed  
Non-Clog Pump  
4B2B / 4C2B - 1760 RPM  
July, 2012



0607  
62L18A

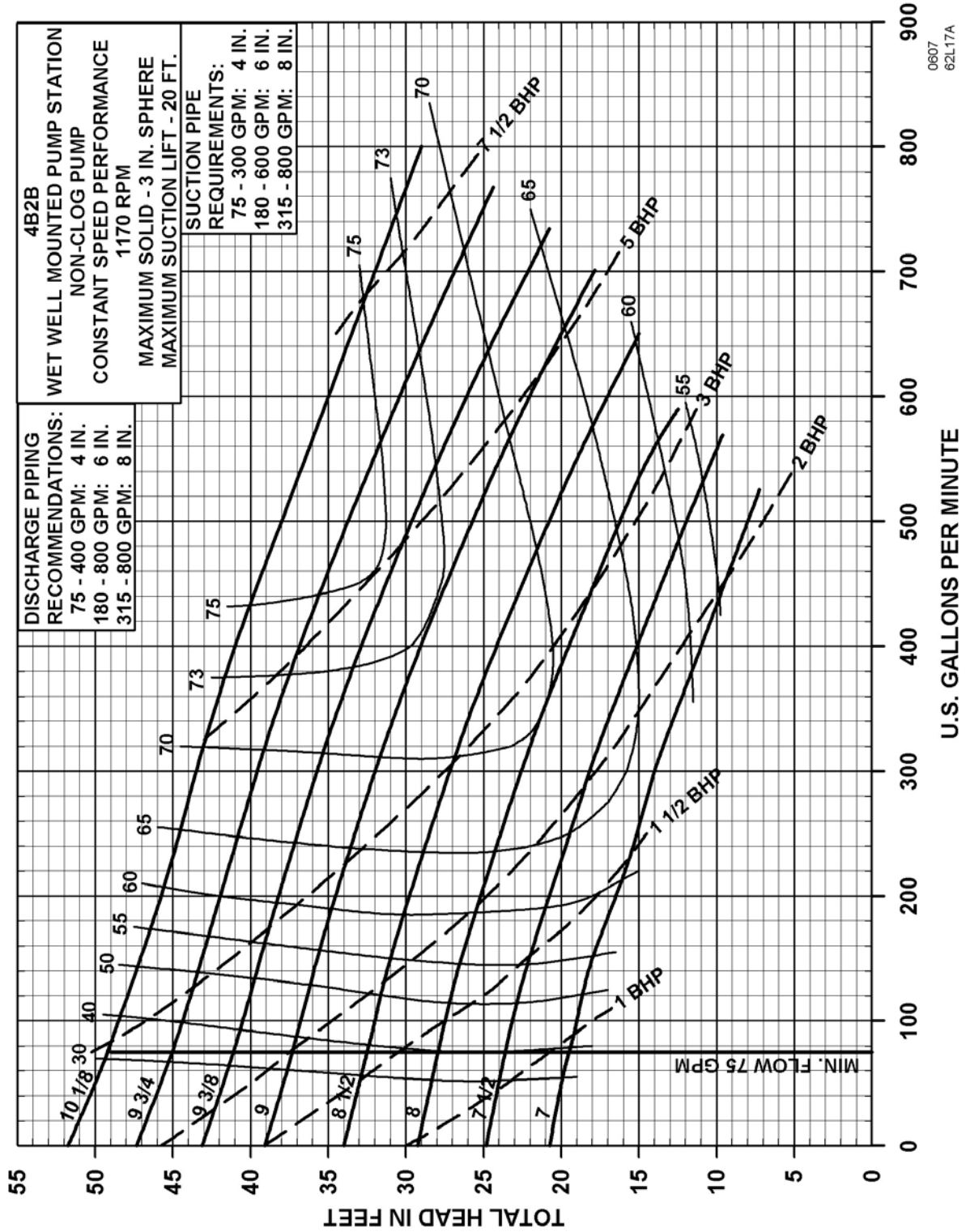
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L17  
Constant Speed  
Non-Clog Pump  
4B2B - 1170 RPM  
July, 2012



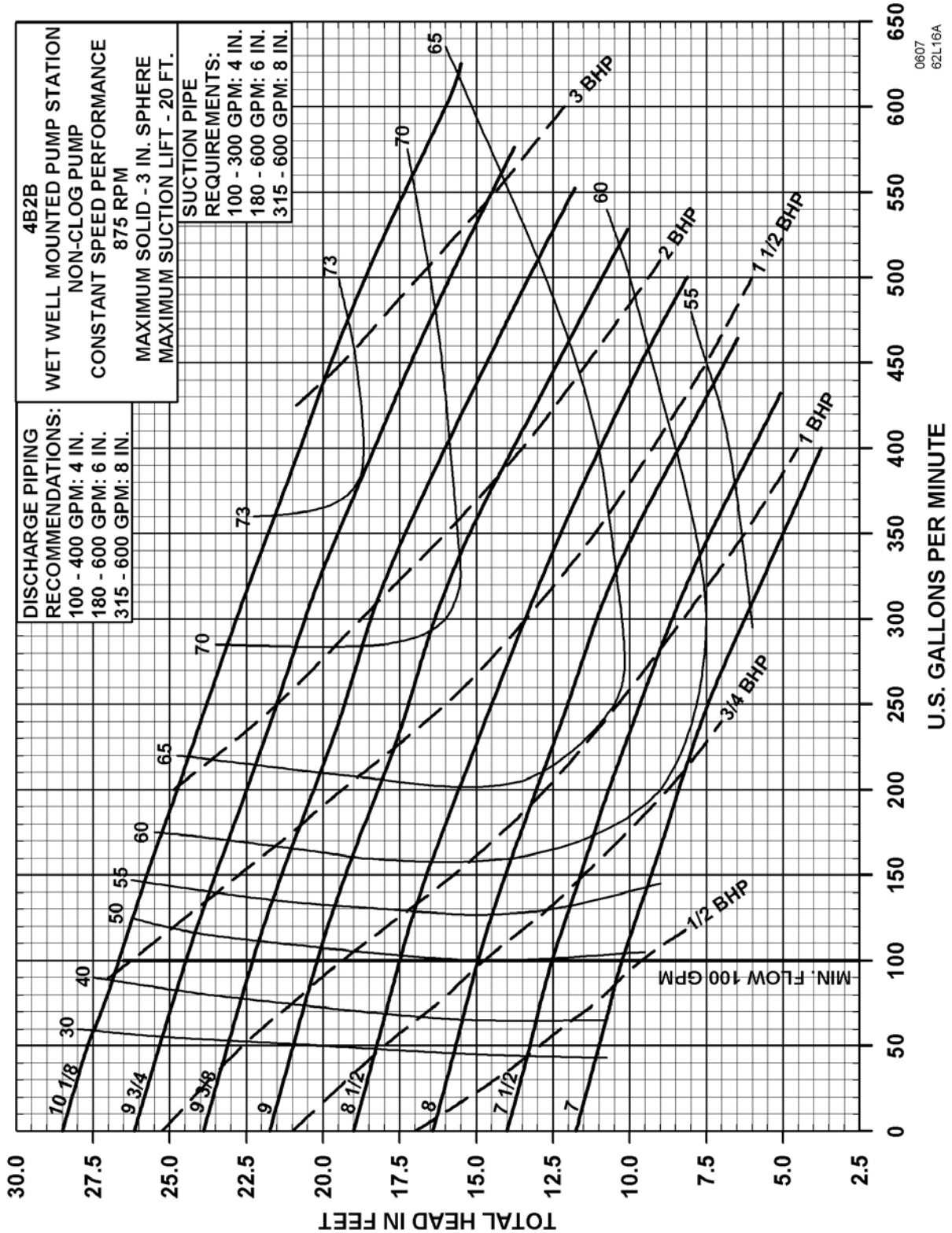
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L16  
Constant Speed  
Non-Clog Pump  
4B2B – 875 RPM  
July, 2012



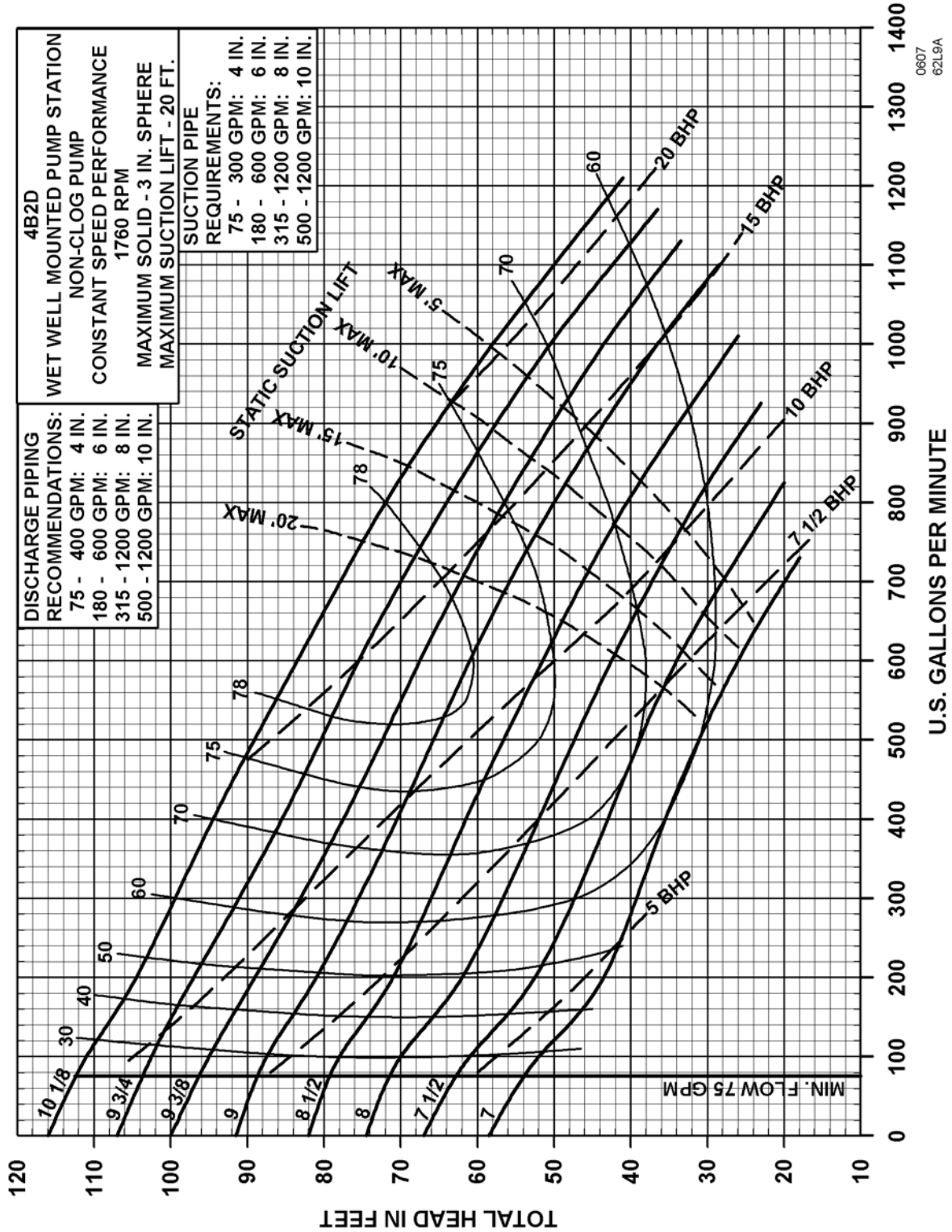
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L9  
Constant Speed  
Non-Clog Pump  
4B2D – 1760 RPM  
July, 2012



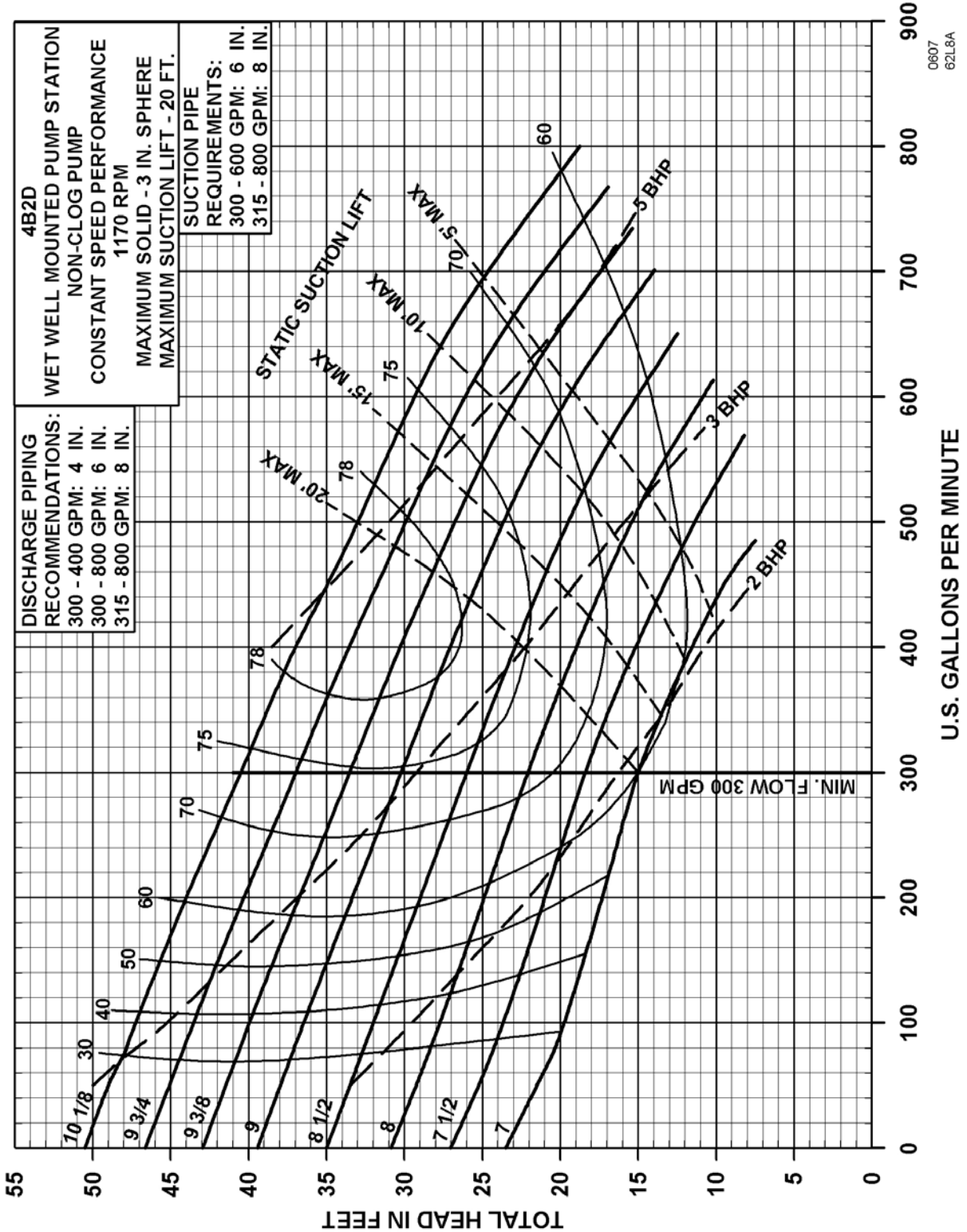
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L8  
Constant Speed  
Non-Clog Pump  
4B2D - 1170 RPM  
July, 2012



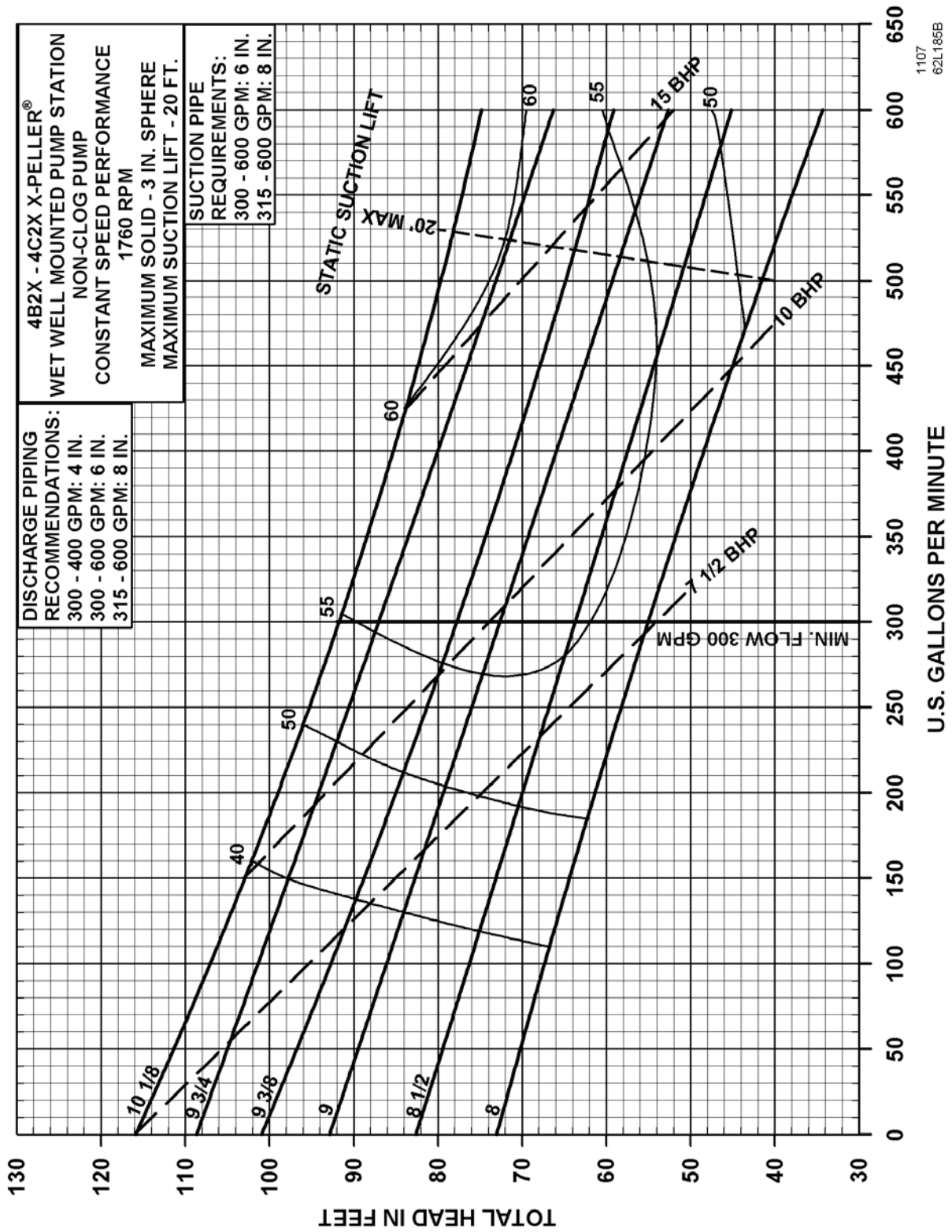
# ENGINEERING DATA



Smith & Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Wet Well Mounted Pump Station  
Performance Curve 62L185  
Constant Speed  
Non-Clog Pump  
X-PELLER® Impeller  
4B2X / 4C2X – 1760 RPM  
July, 2012



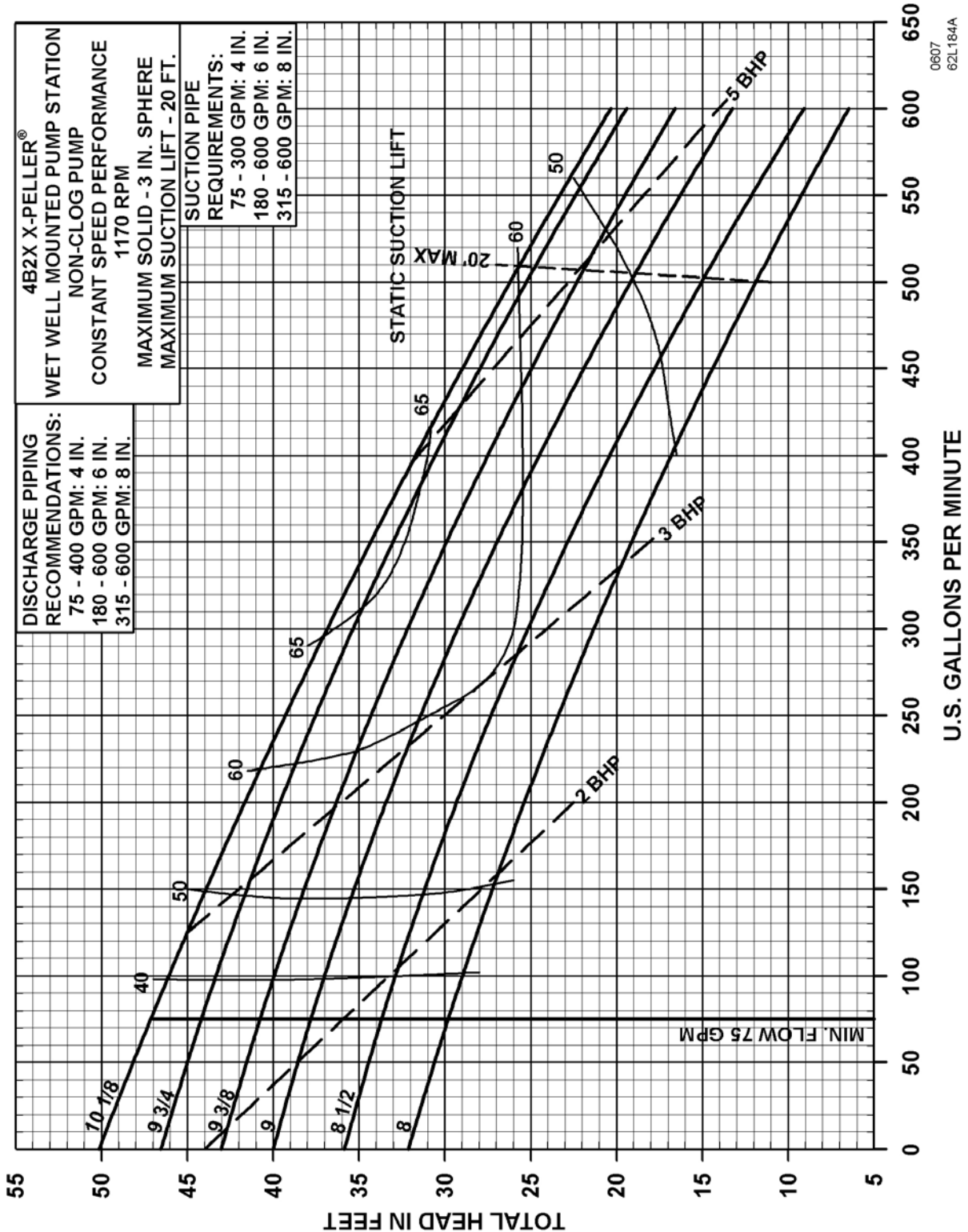
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Wet Well Mounted Pump Station  
Performance Curve 62L184  
Constant Speed  
Non-Clog Pump  
X-PELLER® Impeller  
4B2X - 1170 RPM  
July, 2012



0607  
62L184A



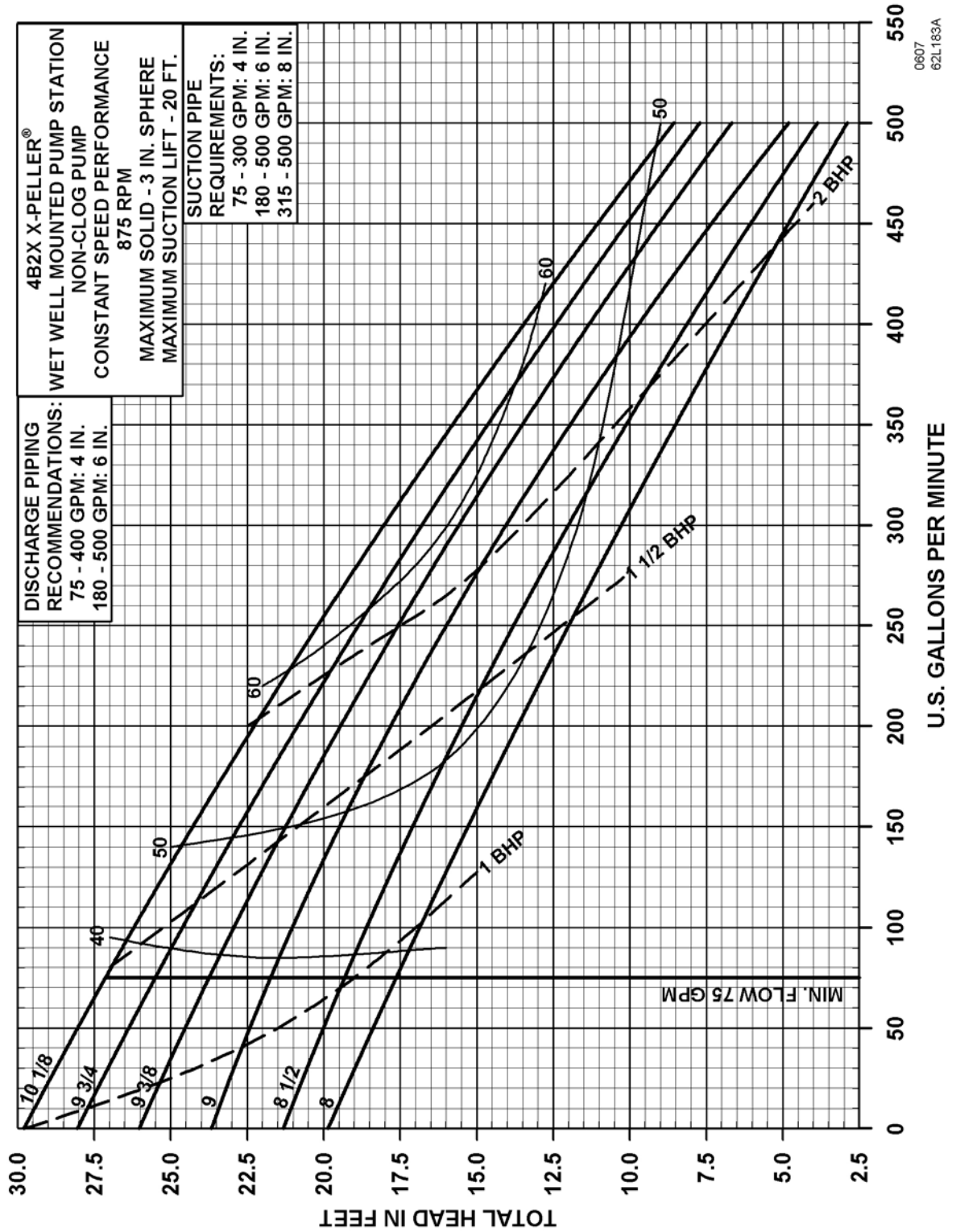
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Wet Well Mounted Pump Station  
Performance Curve 62L183  
Constant Speed  
Non-Clog Pump  
X-PELLER® Impeller  
4B2X – 875 RPM  
July, 2012



# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Pump Assembly Drawing  
4B3B  
Drawing 87B456  
July, 2012

COMMON BILL OF MATERIAL						
Item Qty	UM	Part Number	Row Matl	Description	Size	Wt. Eo
1	EA	60A110		SEAL HOLDER GASKET QUAD RING		
2	1	EA 60A12		IMPELLER BOLT		
3	1	EA 60A20		IMPELLER WASHER		
4	1	EA 60A28		VOLUTE GASKET		
5	1	EA 60A30		SPRING		
6	1	EA 60A32		ROTATING CERAMIC SEAL		
7	1	EA 60A36		STATIONARY CARBON SEAL		
8	1	EA 60A38		QUAD RING		
9	1	EA 60A39		"O" RING		
13	1	EA 60A52		SEAL HOLDER		
15	1	EA 60B16SD		MOTOR ADAPTER MODIFICATION		
16	6	EA 6L56BC		CAPSCREW - SS	5/16"-18 X 1"	
18	4	EA 6L20DC		CAPSCREW	3/8"-16 X 1"	
19	2	EA 1L66B		PIPE PLUG	1/4"	
33	8	EA 6L20HD		CAPSCREW	5/8"-11 X 1 1/4"	
34	8	EA 6L29BL		WASHER, FLAT - REDUCED O.D.	5/8"	
4" SUCTION						
14	1	EA 67B23B		ADAPTER		
25A	1	EA 67D310A		INTERNAL FRONTHEAD VOLUTE - COW	4"	
25B	1	EA 67D310B		INTERNAL FRONTHEAD VOLUTE - CW	4"	
26	2	EA 1L11A		GASKET	4"	
28	8	EA 6L20HF		CAPSCREW	5/8"-11 X 1 3/4"	
29	8	EA 6L178B		CAPSCREW, SOCKET HEAD	5/8"-11 X 2 3/4"	
6" SUCTION						
14	1	EA 67B241		ADAPTER		
25A	1	EA 67D311A		INTERNAL FRONTHEAD VOLUME - COW	6"	
25B	1	EA 67D311B		INTERNAL FRONTHEAD VOLUME - CW	6"	
26	2	EA 1L11CA		GASKET	6"	
28	8	EA 6L20HF		CAPSCREW	3/4"-10 X 2 1/4"	
29	8	EA 6L178F		CAPSCREW, SOCKET HEAD	3/4"-10 X 2 3/4"	
8" SUCTION						
14	1	EA 67B241		ADAPTER		
25A	1	EA 67D311A		INTERNAL FRONTHEAD VOLUME - COW	8"	
25B	1	EA 67D311B		INTERNAL FRONTHEAD VOLUME - CW	8"	
26	2	EA 1L11CA		GASKET	8"	
28	8	EA 6L20HF		CAPSCREW	3/4"-10 X 2 1/4"	
29	8	EA 6L178F		CAPSCREW, SOCKET HEAD	3/4"-10 X 2 3/4"	
30	1	EA 6L20C		REDUCER	8" X 6"	

MOTOR (FACTORY ORDER)  
NOTE: IMPPELLER WASHER RING AND STAINLESS STEEL IMPELLER KEY INCLUDED WITH MOTOR.

IMPELLER (SEE FACTORY ORDER)

NOTES:  
1. COPYRIGHT (C) 2004, 2006, 2007, 2008 SMITH & LOVELESS, INC.  
2. SPECIFY CW OR COW ON INTERNAL FRONTHEAD VOLUME.

4" OR 6" SUCTION PIPE (NOT BY S&L)  
OR 6" X 6" (L20C) REDUCER  
SUCTION PIPE (NOT BY S&L)

DESIGN	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD
D	10/07-7/11/06	JTB	WJ	10/07-7/11/06	JTB	WJ	10/07-7/11/06	JTB	WJ
C	10/07-7/11/06	RGD	WJ	10/07-7/11/06	RGD	WJ	10/07-7/11/06	RGD	WJ
B	10/07-6/14/07	FT	WJ	10/07-6/14/07	FT	WJ	10/07-6/14/07	FT	WJ
A	10/06-6/14/06	WJ	WJ	10/06-6/14/06	WJ	WJ	10/06-6/14/06	WJ	WJ
LET	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD

FORM NO.	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD

SCALE	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD
1/4" = 1"									

FILE	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD

ITEM NO.	DESCRIPTION	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD
1	REV D									

# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

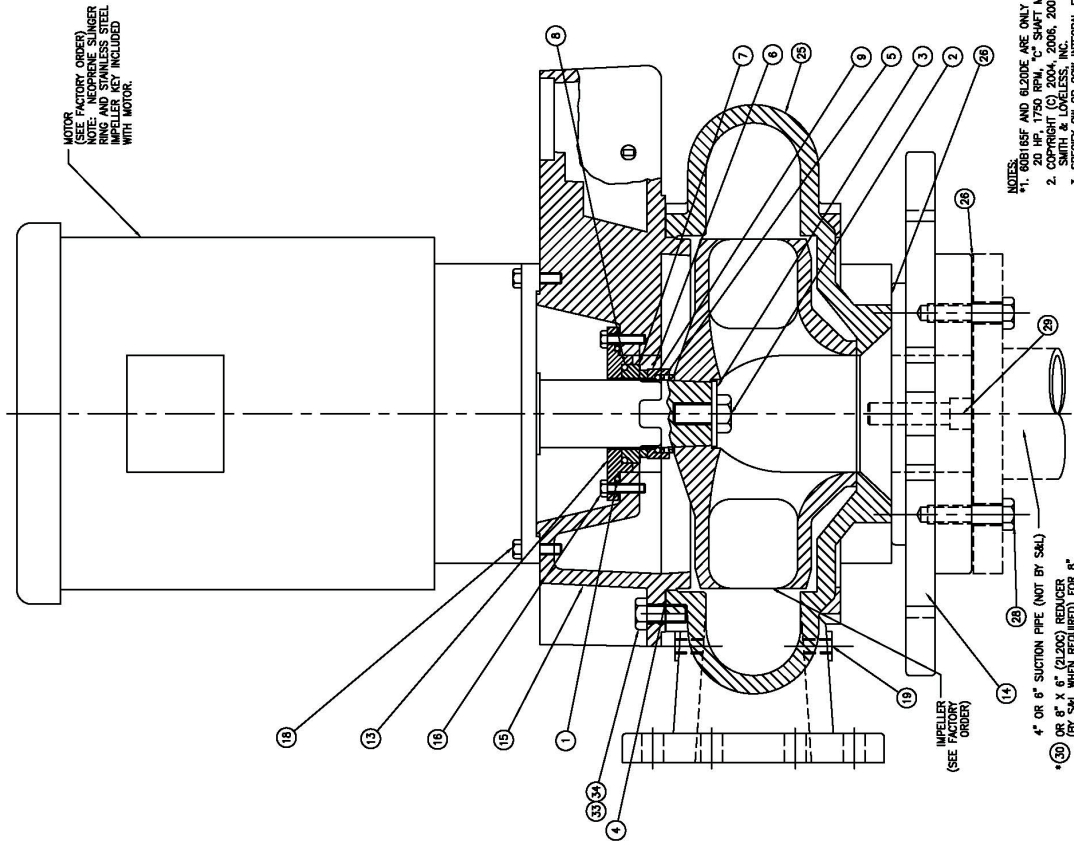
Pump Assembly Drawing  
4C3B  
Drawing 87B457  
July, 2012

COMMON BILL OF MATERIAL				
Item	Qty	UM	Part Number	Description
1	1	EA	80A111	SEAL HOLDER GASKET QUAD RING
2	1	EA	80A12	IMPELLER BOLT
3	1	EA	80A20	IMPELLER WASHER
4	1	EA	80A28	VOLUTE GASKET
5	1	EA	80A31	SPRING
6	1	EA	80A33	ROTATING CERAMIC SEAL
7	1	EA	80A37	STATIONARY CARBON SEAL
8	1	EA	80A40	QUAD RING
9	1	EA	80A41	"O" RING
13	1	EA	87B19	SEAL HOLDER
15	1	EA	80B16SE	MOTOR ADAPTER MODIFICATION
15	1	EA	80B16SF	MOTOR ADAPTER MODIFICATION
16	6	EA	8L59BC	CAPSCREW - SS
18	4	EA	8L20DE	CAPSCREW
18	4	EA	8L20HE	CAPSCREW
19	2	EA	1L68B	PIPE PLUG
33	8	EA	8L20HD	CAPSCREW
34	8	EA	8L29BL	WASHER, FLAT - REDUCED O.D.

4" SUCTION				
14	1	EA	87B239	ADAPTER
25A	1	EA	87D310A	INTEGRAL FRONTHEAD VOLUME - COW
25B	1	EA	87D310B	INTEGRAL FRONTHEAD VOLUME - CW
26	2	EA	1L11AA	GASKET
26	8	EA	8L20HF	CAPSCREW
29	8	EA	8L178B	CAPSCREW, SOCKET HEAD

6" SUCTION				
14	1	EA	87B241	ADAPTER
25A	1	EA	87D311A	INTEGRAL FRONTHEAD VOLUME - COW
25B	1	EA	87D311B	INTEGRAL FRONTHEAD VOLUME - CW
26	2	EA	1L11CA	GASKET
26	8	EA	8L20JH	CAPSCREW
29	8	EA	8L178F	CAPSCREW, SOCKET HEAD

8" SUCTION				
14	1	EA	87B241	ADAPTER
25A	1	EA	87D311A	INTEGRAL FRONTHEAD VOLUME - COW
25B	1	EA	87D311B	INTEGRAL FRONTHEAD VOLUME - CW
26	2	EA	1L11CA	GASKET
26	8	EA	8L20JH	CAPSCREW
29	8	EA	8L178F	CAPSCREW, SOCKET HEAD
30	1	EA	2L20C	REDUCER



- NOTES:
1. 80B16SF AND 8L20DE ARE ONLY USED WITH IMPELLER (SEE CAPTION) WASHER IMPELLER KEY INCLUDED WITH MOTOR.
  2. COPYRIGHT © 2004, 2006, 2007, 2008 SMITH & LOVELESS, INC.
  3. SPECIFY CW OR COW INTEGRAL FRONTHEAD VOLUME.

DATE	BY	DESCRIPTION
D	12/07/11	REV D
C	12/07/10	REV C
B	12/07/09	REV B
A	12/06/08	REV A

DRAWN BY: JFB  
 CHECKED BY: RGD  
 APPROVED BY: FT  
 SCALE: NTS  
 DATE: 8/7/10

PUMP ASSEMBLY  
 4C3B  
 SUB 87B457D  
 87B457/D

# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

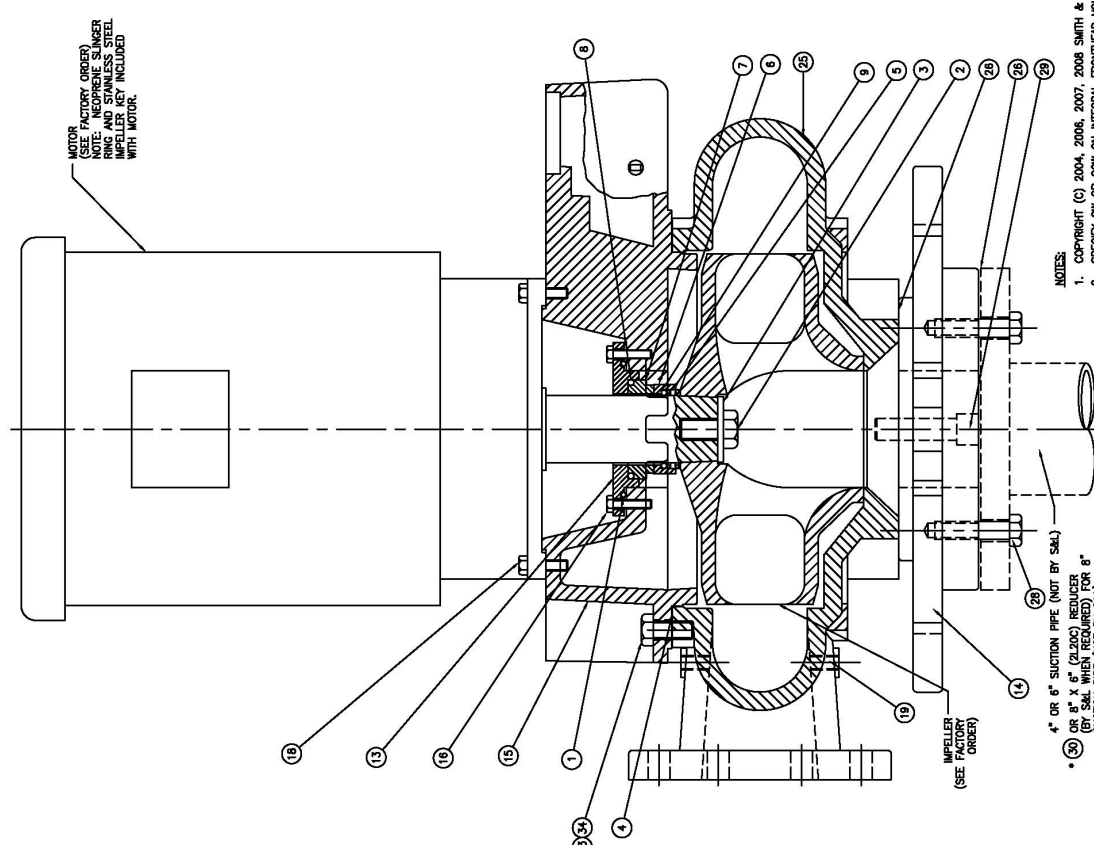
Pump Assembly Drawing  
4D3B  
Drawing 87B458  
July, 2012

COMMON BILL OF MATERIAL				Wt. Ea		
Item	Qty	UM	Part Number	Description	Row Matl	Size
1	EA	EA	80A461	SEAL HOLDER GASKET QUAD RING		
2	EA	EA	80A47	IMPELLER BOLT		
3	EA	EA	80A56	IMPELLER WASHER		
4	EA	EA	80A28	VOLUTE GASKET		
5	EA	EA	80A55	SPRING		
6	EA	EA	80A85	ROTATING CERAMIC SEAL		
7	EA	EA	80A52	STATIONARY CARBON SEAL		
8	EA	EA	80A54	QUAD RING		
9	EA	EA	80A53	7" RING		
13	EA	EA	87B73	SEAL HOLDER		
15	EA	EA	80B165M	MOTOR ADAPTER MODIFICATION		
16	EA	EA	8L59EC	CAPSCREW - SS		1/2"-13 X 1"
18	EA	EA	8L20HE	CAPSCREW		5/8"-11 X 1 1/2"
19	EA	EA	1L69B	PIPE PLUG		1/4"
33	EA	EA	8L20HD	CAPSCREW		5/8"-11 X 1 1/4"
34	EA	EA	8L229L	WASHER, FLAT - REDUCED O.D.		5/8"

4" SUCTION						
14	EA	EA	87B241	ADAPTER		
25A	EA	EA	87D310A	INTEGRAL FRONTHEAD VOLUTE - CCW		4"
25B	EA	EA	87D310B	INTEGRAL FRONTHEAD VOLUTE - CW		4"
28	EA	EA	11L1MA	GASKET		4"
28	EA	EA	8L20HF	CAPSCREW		5/8"-11 X 1 3/4"
29	EA	EA	8L178B	CAPSCREW, SOCKET HEAD		5/8"-11 X 2 3/4"

6" SUCTION						
14	EA	EA	87B241	ADAPTER		
25A	EA	EA	87D311A	INTEGRAL FRONTHEAD VOLUTE - CCW		6"
25B	EA	EA	87D311B	INTEGRAL FRONTHEAD VOLUME - CW		6"
28	EA	EA	11L1CA	GASKET		6"
28	EA	EA	8L20H	CAPSCREW		3/4"-10 X 2 1/4"
29	EA	EA	8L178F	CAPSCREW, SOCKET HEAD		3/4"-10 X 2 3/4"

8" SUCTION						
14	EA	EA	87B241	ADAPTER		
25A	EA	EA	87D311A	INTEGRAL FRONTHEAD VOLUME - CCW		6"
25B	EA	EA	87D311B	INTEGRAL FRONTHEAD VOLUME - CW		6"
28	EA	EA	11L1CA	GASKET		6"
28	EA	EA	8L20H	CAPSCREW		3/4"-10 X 2 1/4"
29	EA	EA	8L178F	CAPSCREW, SOCKET HEAD		3/4"-10 X 2 3/4"
30	EA	EA	2L20C	REDUCER		8" X 6"



MOTOR  
(SEE FACTORY ORDER)  
NOTE: IMPELLER, SEALER  
IMPELLER WASHER,  
IMPELLER BOLT,  
IMPELLER ARE INCLUDED  
WITH MOTOR.

- NOTES:  
1. COPYRIGHT (C) 2004, 2006, 2007, 2008 SMITH & LOVELESS, INC.  
2. SPECIFY CW OR CCW ON INTEGRAL FRONTHEAD VOLUME.

\* (30) 4" OR 6" SUCTION PIPE (NOT BY SEAL)  
OR 8" X 6" (2L20C) REDUCER  
(BY SEAL WHEN REQUIRED) FOR 8"  
SUCTION PIPE (NOT BY SEAL)

DATE		BY	FOR
D	10/20/07-7/11	WMS	ALUMINUM
C	10/20/07-7/2	WMS	FRONTHEAD
B	10/20/07-6/12/2007	WMS	FRONTHEAD
A	10/20/07-6/1	WMS	FRONTHEAD

DATE	BY	DESCRIPTION
10/20/07-7/11	WMS	REVISED
10/20/07-7/2	WMS	REVISED
10/20/07-6/12/2007	WMS	REVISED
10/20/07-6/1	WMS	REVISED

DATE	BY	DESCRIPTION
10/20/07-7/11	WMS	REVISED
10/20/07-7/2	WMS	REVISED
10/20/07-6/12/2007	WMS	REVISED
10/20/07-6/1	WMS	REVISED

DATE	BY	DESCRIPTION
10/20/07-7/11	WMS	REVISED
10/20/07-7/2	WMS	REVISED
10/20/07-6/12/2007	WMS	REVISED
10/20/07-6/1	WMS	REVISED

DATE	BY	DESCRIPTION
10/20/07-7/11	WMS	REVISED
10/20/07-7/2	WMS	REVISED
10/20/07-6/12/2007	WMS	REVISED
10/20/07-6/1	WMS	REVISED

DATE	BY	DESCRIPTION
10/20/07-7/11	WMS	REVISED
10/20/07-7/2	WMS	REVISED
10/20/07-6/12/2007	WMS	REVISED
10/20/07-6/1	WMS	REVISED

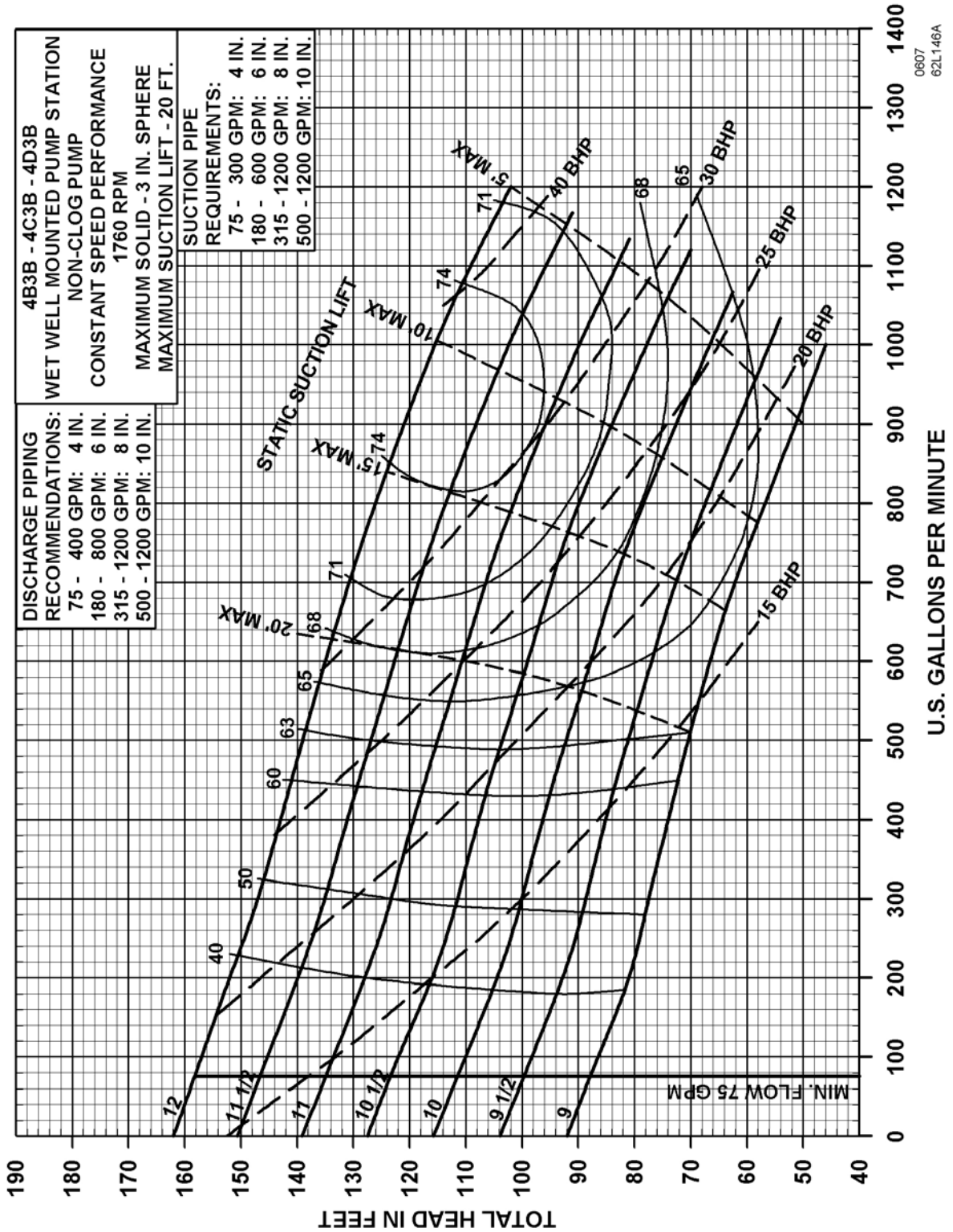
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L146  
Constant Speed  
Non-Clog Pump  
4B3B / 4C3B / 4D3B – 1760 RPM  
July, 2012



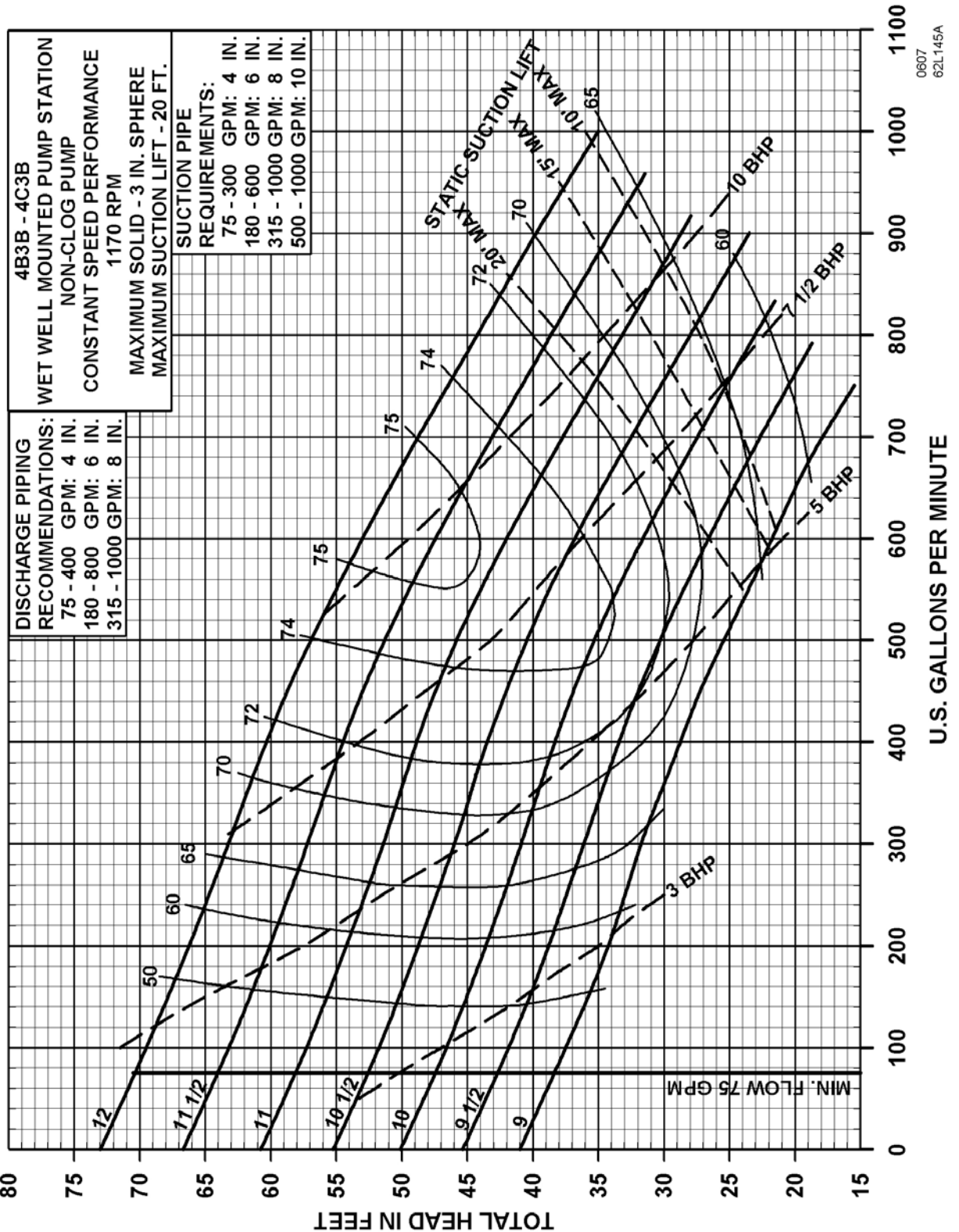
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L145  
Constant Speed  
Non-Clog Pump  
4B3B / 4C3B – 1170 RPM  
July, 2012



# ENGINEERING DATA

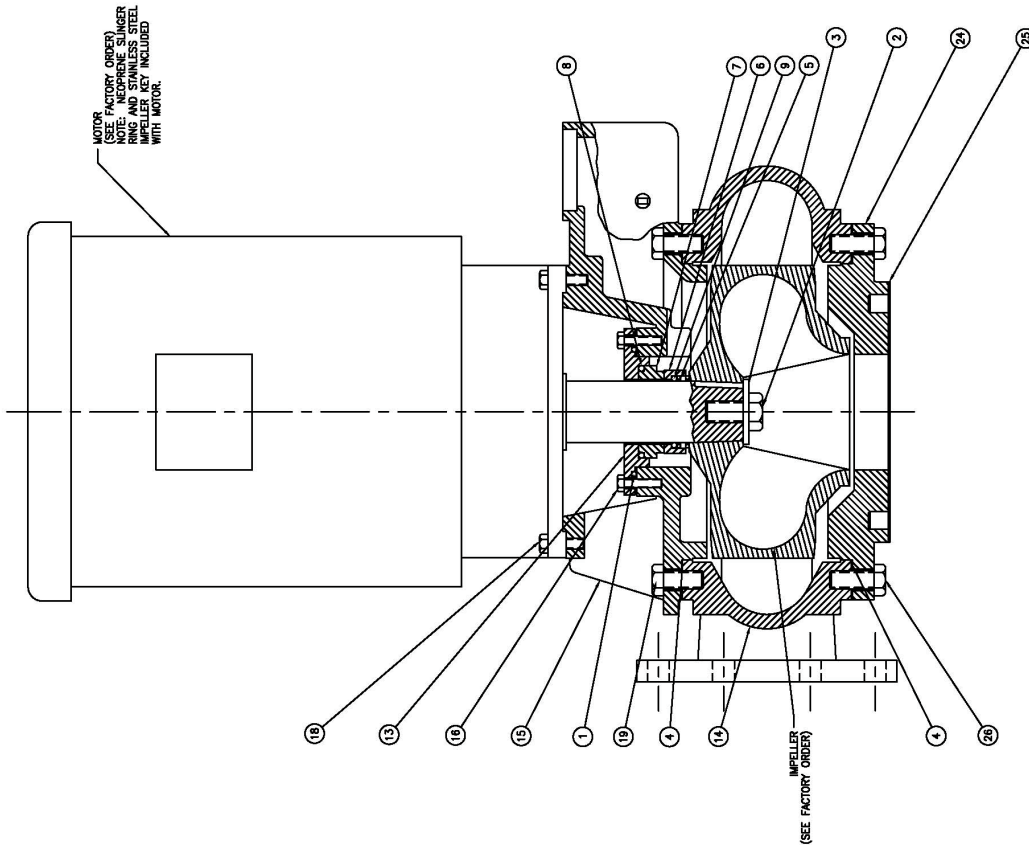


Smith & Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Pump Assembly Drawing  
4D4B  
Drawing 87B646  
July, 2012

Item Qty	UM	Part Number	Raw Matl	Description	Size	Wt Ea
1	EA	60A112		SEAL HOLDER GASKET QUAD RING		
1	EA	60A97		IMPELLER BOLT		
1	EA	60A86		IMPELLER WASHER		
2	EA	60A106B		VOLUTE GASKET		
5	EA	60A45		SPRING		
6	EA	60A85		ROTATING CERAMIC SEAL		
7	EA	60A92		STATIONARY CARBON SEAL		
8	EA	60A44		QUAD RING		
9	EA	60A53		7" RING		
13	EA	67B105		SEAL HOLDER		
14	EA	60D252		VOLUTE		
15	EA	60B165Q		MOTOR ADAPTER MODIFICATION		
16	EA	629EC		CAPSCREW, SS	1/2"-13 x 1"	
18	EA	620HE		CAPSCREW	5/8"-11 x 1 1/2"	
19	EA	620HD		CAPSCREW	5/8"-11 x 1 1/4"	
24	EA	60B124		FRONTHEAD	6"	
25	EA	11LIC		GASKET		
26	EA	620HF		CAPSCREW	5/8"-11 x 1 3/4"	



**NOTES:**

1. COPYRIGHT (C) 2008, 2009 SMITH & LOVELESS, INC.

DESIGNED BY: R. DIEHM	DATE: 1/1/08	ALLOWABLE TOLERANCES	FOR	PUMP ASSEMBLY 4D4B	87B646/A
CHECKED BY: BFO	DATE: 1/1/08	FRACTIONS			
APPROVED BY: P.T.	DATE: 1/1/08	DECIMALS			
DATE: 1/1/08	SCALE: 1"=2.000"				
LET: EA	DATE: 1/1/08	CODE: 1	SIZE: 1/2"	U/M: EA	W.C.
DATE: 1/1/08	DATE: 1/1/08	DATE: 1/1/08	DATE: 1/1/08	FILE: \SUB\87B646A	DATE: 1/1/08
SHEET 1 OF 1				SMITH & LOVELESS, INC.	

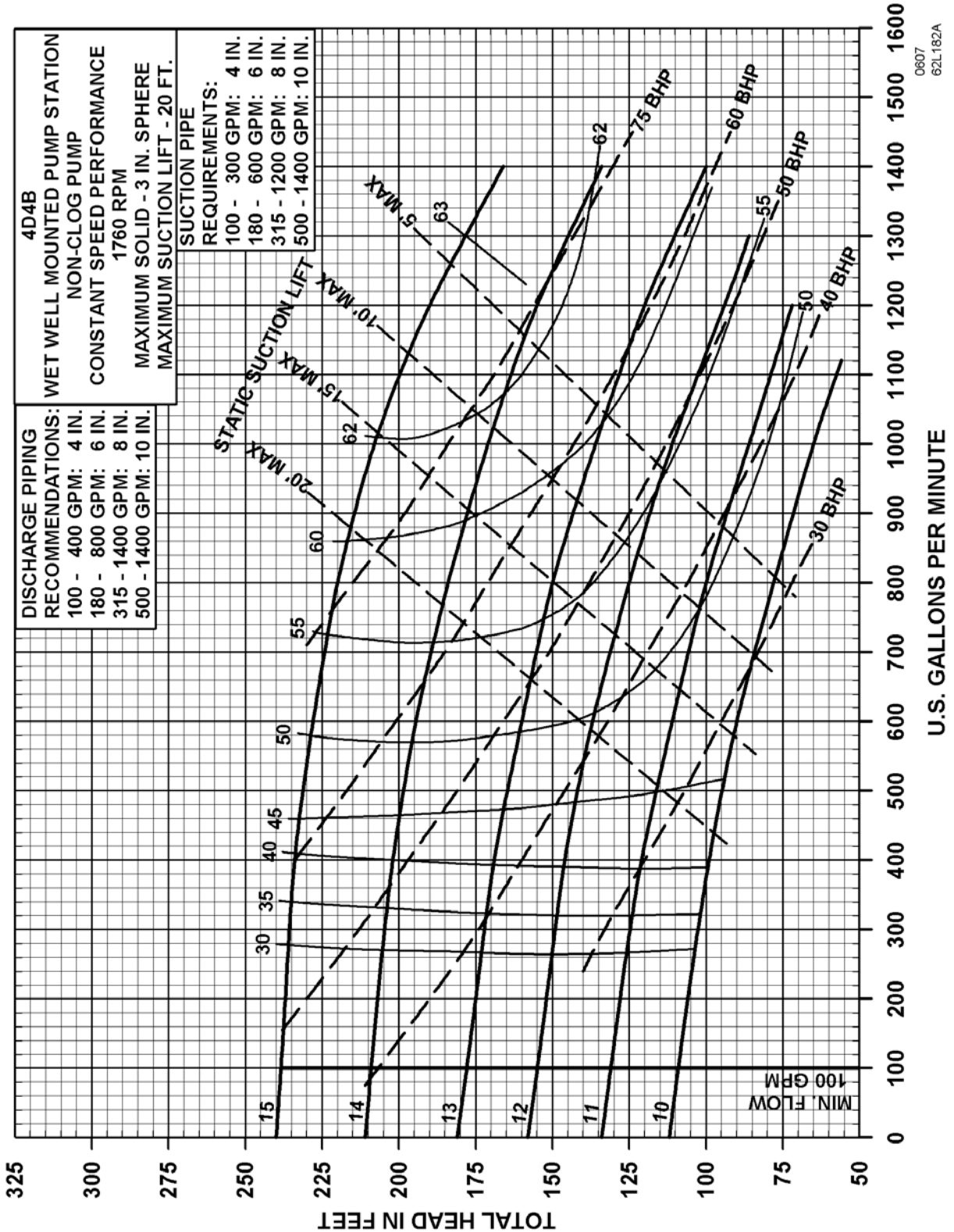
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L182  
Constant Speed  
Non-Clog Pump  
4D4B - 1760 RPM  
July, 2012





# ENGINEERING DATA



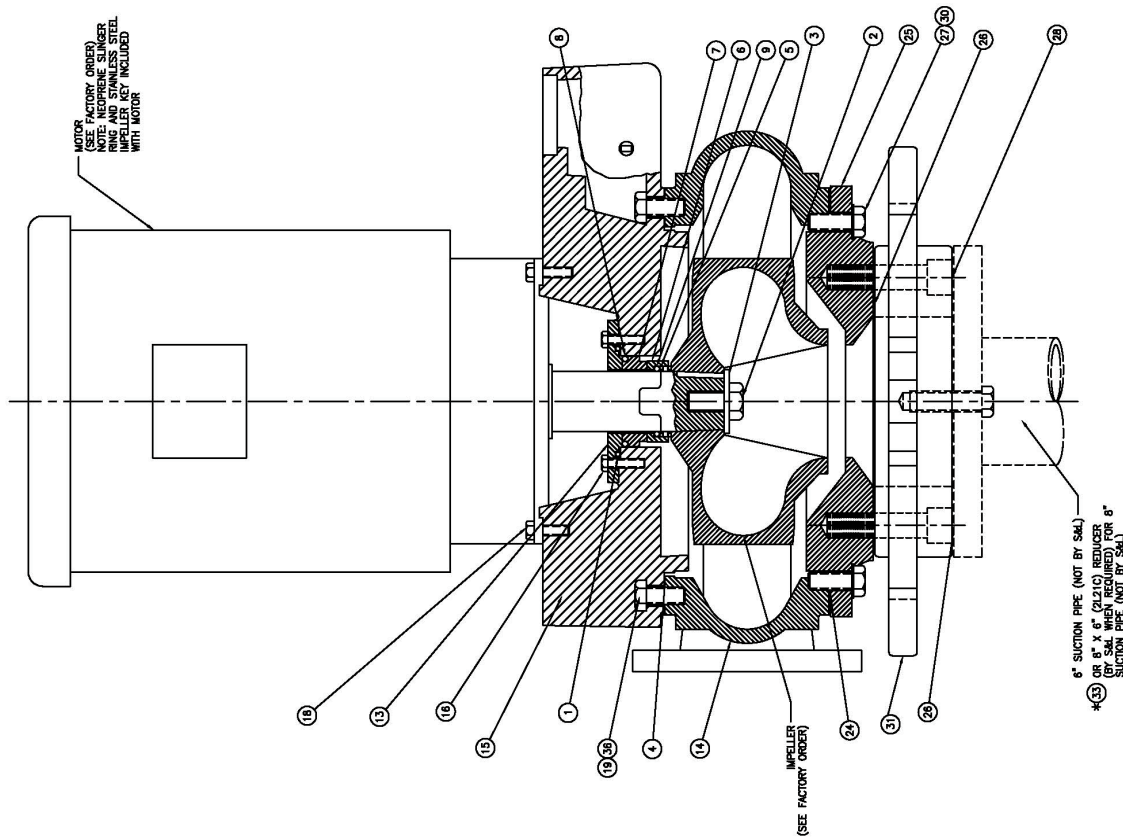
Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Pump Assembly Drawing  
6B3\_  
Drawing 87B467  
July, 2012

Item Qty	UM	Part Number	Rev	Matl	Description	Size	Wt Ea
1	EA	60A110			SEAL HOLDER GASKET QUAD RING		
2	1	EA	60A12		IMPELLER BOLT		
3	1	EA	60A20		IMPELLER WASHER		
4	1	EA	60A28		VOLUTE GASKET		
5	1	EA	60A30		SPRING		
6	1	EA	60A32		ROTATING CERAMIC SEAL		
7	1	EA	60A36		STATIONARY CARBON SEAL		
8	1	EA	60A38		QUAD RING		
9	1	EA	60A39		Y" RING		
13	1	EA	6792		SEAL HOLDER		
14	1	EA	60D35		VOLUTE		
15	1	EA	60B160D		MOTOR ADAPTER MODIFICATION		
16	6	EA	6L598C		CAPSCREW - SS	5/16"-18 X 1"	
18	4	EA	6L200C		CAPSCREW	3/8"-18 X 1"	
19	8	EA	6L204D		CAPSCREW	5/8"-11 X 1 1/4"	
24	2	EA	60A09		VOLUTE GASKET		
25	1	EA	60C88		FRONTHEAD	6"	
26	2	EA	11L1CA		GASKET	6"	
27	8	EA	6L208E		CAPSCREW	5/8"-11 X 1 1/2"	
28	8	EA	6L178F		CAPSCREW SOCKET HEAD	3/4"-10 X 2 3/4"	
30	8	EA	6L61L		WASHER, FLAT	5/8"	
31	1	EA	6792A1		MOUNTING ADAPTER	8" X 6"	
33	1	EA	2L21C		REDUCER	8" X 6"	
36	8	EA	6L228L		WASHER, FLAT - REDUCED O.D.	5/8"	

\* \*



NOTE:  
1. COPYRIGHT (C) 2004, 06, 07, 08, 12 SMITH & LOVELESS, INC.

REV	DATE	BY	CHKD	DESCRIPTION
E	06/01/11	WJM		ISSUE FOR PRODUCTION
D	02/07/11	WJM		ISSUE FOR PRODUCTION
C	02/07/11	WJM		ISSUE FOR PRODUCTION
B	02/07/11	WJM		ISSUE FOR PRODUCTION
A	02/07/11	WJM		ISSUE FOR PRODUCTION

DESIGNER	DATE	SCALE	FILE
WJM	07/2012	1:1	87B467E.dwg

DRWING NO.	DATE	SCALE	FILE
87B467	07/2012	1:1	87B467E.dwg

REV	DATE	DESCRIPTION
1	07/2012	ISSUE FOR PRODUCTION

REV	DATE	DESCRIPTION
1	07/2012	ISSUE FOR PRODUCTION

# ENGINEERING DATA

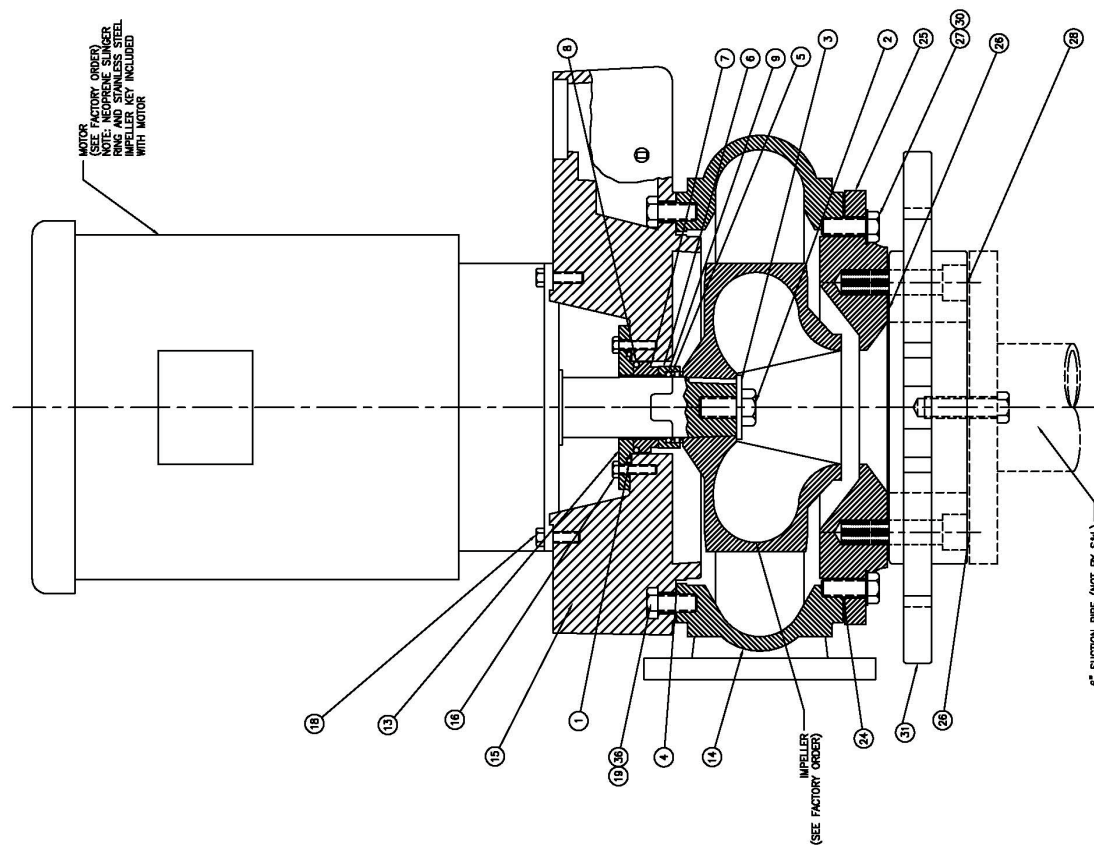


Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Pump Assembly Drawing  
6C3\_  
Drawing 87B468  
July, 2012

Item	Qty	UM	Part Number	Rev	Matl	Description	Size	Wk Ex
1	EA		60A11			SEAL HOLDER GASKET QUAD RING		
2	1	EA	60A12			IMPELLER BOLT		
3	1	EA	60A20			IMPELLER WASHER		
4	1	EA	60A28			VOLUTE GASKET		
5	1	EA	60A31			SPRING		
6	1	EA	60A33			ROTATING CERAMIC SEAL		
7	1	EA	60A37			STATIONARY CARBON SEAL		
8	1	EA	60A40			QUAD RING		
9	1	EA	60A41			"O" RING		
13	1	EA	87B19			SEAL HOLDER		
14	1	EA	60D35			VOLUTE		
15	1	EA	60B15E			MOTOR ADAPTER MODIFICATION		
16	6	EA	60B15F			MOTOR ADAPTER MODIFICATION		
18	4	EA	6L200E			CAPSCREW - SS	5/16"-18 X 1"	
18	4	EA	6L204E			CAPSCREW	3/8"-11 X 1 1/2"	
19	8	EA	6L204D			CAPSCREW	5/8"-11 X 1 1/2"	
24	2	EA	60A28			VOLUTE GASKET		
25	1	EA	60C88			FRONTHEAD	6"	
26	2	EA	11L1CA			GASKET	6"	
27	8	EA	6L204E			CAPSCREW	5/8"-11 X 1 1/2"	
28	8	EA	6L178E			CAPSCREW, SOCKET HEAD	3/4"-10 X 2 3/4"	
30	8	EA	6L61L			WASHER, FLAT	5/8"	
31	1	EA	87B441			MOUNTING ADAPTER		
33	1	EA	2L21C			REDUCER	8" X 6"	
36	8	EA	6L229L			WASHER, FLAT - REDUCED O.D.	5/8"	



NOTE:  
\* 1. 60B15F AND 6L200E ARE ONLY USED WITH 20 HP, 1750 RPM, "C" SHMT MOTORS.  
2. COPYRIGHT (C) 2004, 05, 07, 08, 12 SMITH & LOVELESS, INC.

Rev	By	Date	Description
1			
2			
3			
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35			
36			

6" SUCTION PIPE (NOT BY SAL)  
8" X 6" (2.5:1) REDUCER (BY SAL WHEN REQUIRED FOR 8" SUCTION PIPE (NOT BY SAL))

# ENGINEERING DATA



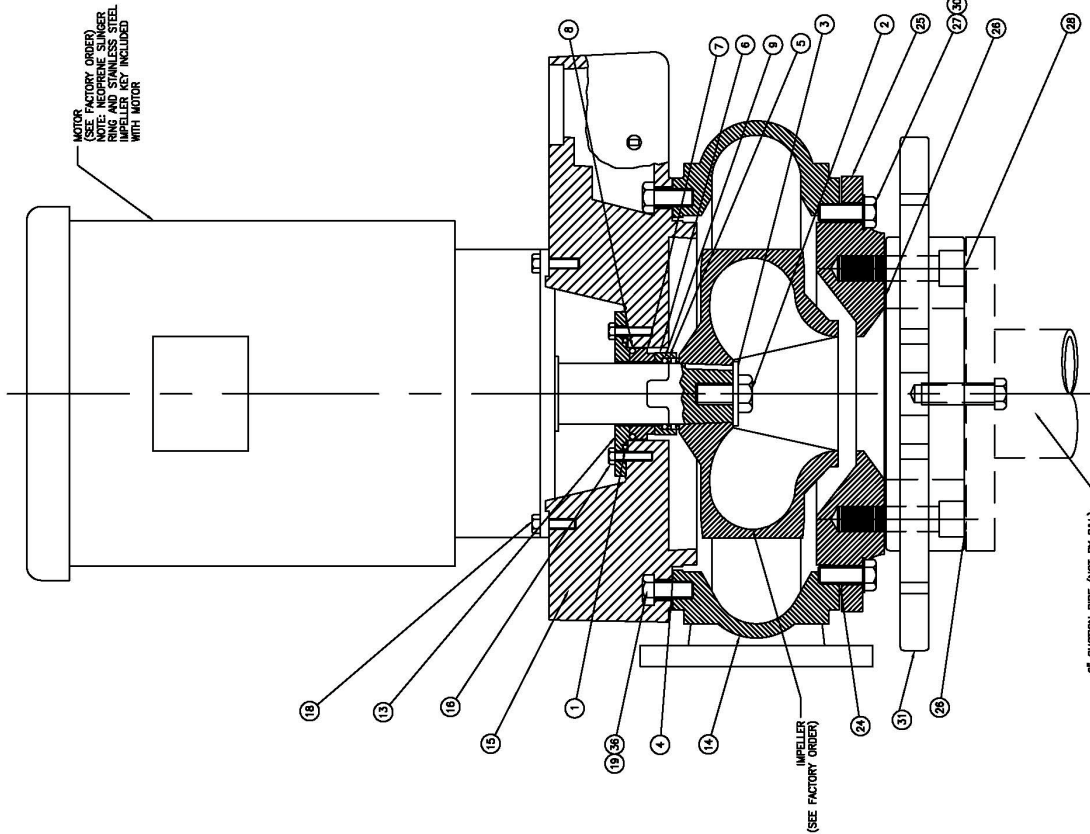
Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Pump Assembly Drawing  
6D3\_  
Drawing 87B469  
July, 2012

Item Qty	UM	Part Number	Row Matl	Description	Size	Wt Ea
1	EA	60A146		SEAL HOLDER GASKET QUAD RING		
2	1	EA 60A97		IMPELLER BOLT		
3	1	EA 60A96		IMPELLER WASHER		
4	1	EA 60A98		VOLUTE GASKET		
5	1	EA 60A95		SPRING		
6	1	EA 60A95		ROTATING CERAMIC SEAL		
7	1	EA 60A92		STATIONARY CARBON SEAL		
8	1	EA 60A54		QUAD RING		
9	1	EA 60A53		YOT RING		
13	1	EA 87B73		SEAL HOLDER		
14	1	EA 60D35		VOLUTE		
15	1	EA 60B16M		MOTOR ADAPTER MODIFICATION		
16	6	EA 6L56C		CAPSCREW - SS	1/2" - 13 X 1"	
18	4	EA 6L20HE		CAPSCREW	5/8" - 11 X 1 1/2"	
19	8	EA 6L20HD		CAPSCREW	5/8" - 11 X 1 1/4"	
24	2	EA 60A99		VOLUTE GASKET		
25	1	EA 60C8B		FRONTHEAD	6"	
26	2	EA 11L1CA		GASKET	6"	
27	6	EA 6L20HE		CAPSCREW	5/8" - 11 X 1 1/2"	
28	6	EA 6L178F		CAPSCREW, SOCKET HEAD	3/4" - 10 X 2 3/4"	
30	8	EA 6L61L		WASHER, FLAT	5/8"	
31	1	EA 87B241		MOUNTING ADAPTER		
33	1	EA 2L21C		REDUCER	8" X 6"	
36	6	EA 6L229L		WASHER, FLAT - REDUCED O.D.	5/8"	

\* \*



NOTE:

1. COPYRIGHT (C) 2004, 05, 06, 07, 08, 12 SMITH & LOVELESS, INC.

ITEM NO.	REV	DATE	BY	CHKD	DESCRIPTION
E	1	10/07	JM		ISSUE FOR
D	1	10/07	JM		ISSUE FOR
C	1	10/07	JM		ISSUE FOR
B	1	10/07	JM		ISSUE FOR
A	1	10/07	JM		ISSUE FOR

DATE	BY	CHKD	DESCRIPTION
10/07	JM		ISSUE FOR
10/07	JM		ISSUE FOR
10/07	JM		ISSUE FOR
10/07	JM		ISSUE FOR
10/07	JM		ISSUE FOR

DATE	BY	CHKD	DESCRIPTION
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10/07	JM		ISSUE FOR
10/07	JM		ISSUE FOR
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10/07	JM		ISSUE FOR

DATE	BY	CHKD	DESCRIPTION
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10/07	JM		ISSUE FOR

DATE	BY	CHKD	DESCRIPTION
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DATE	BY	CHKD	DESCRIPTION
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10/07	JM		ISSUE FOR

DATE	BY	CHKD	DESCRIPTION
10/07	JM		ISSUE FOR
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DATE	BY	CHKD	DESCRIPTION
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10/07	JM		ISSUE FOR
10/07	JM		ISSUE FOR
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10/07	JM		ISSUE FOR

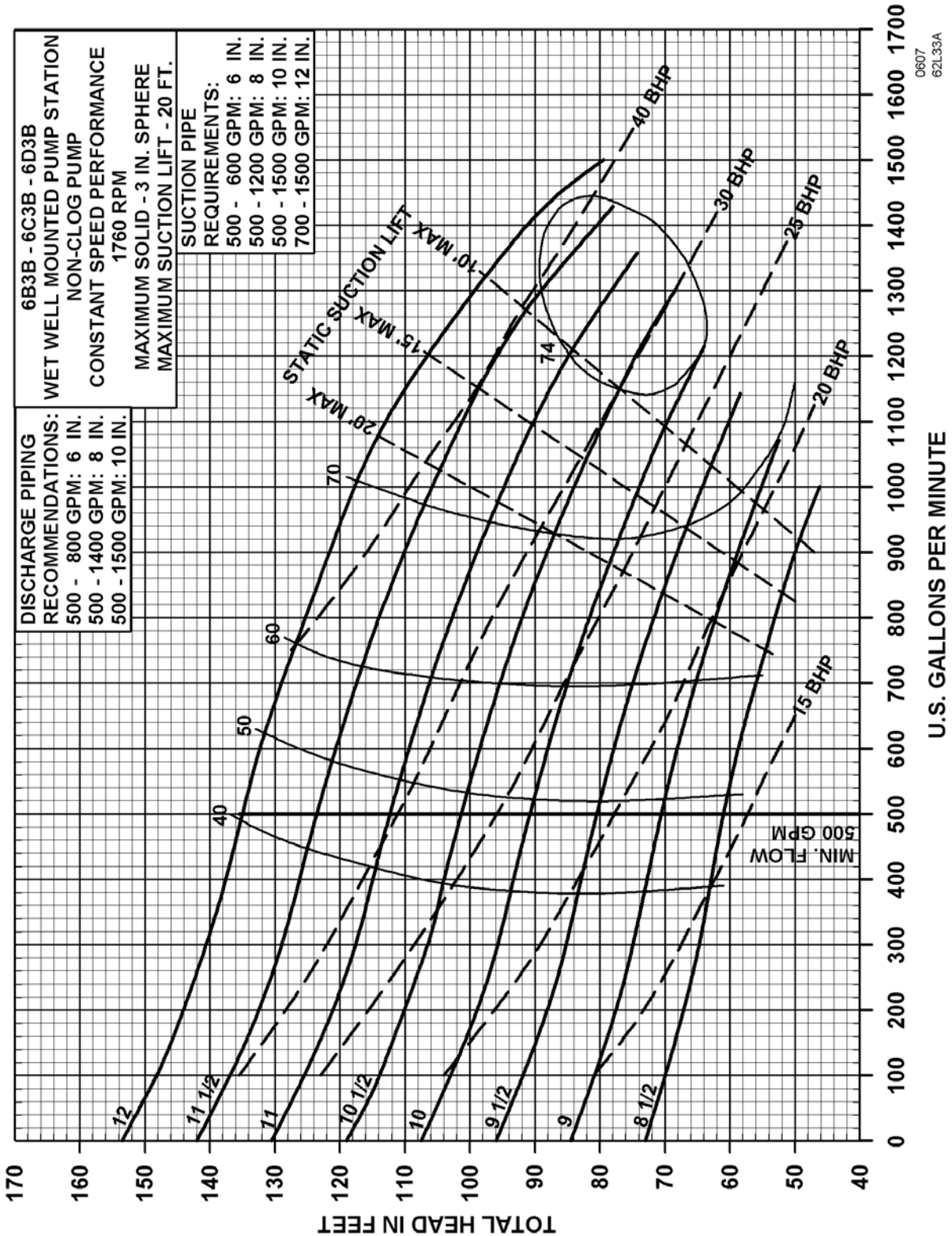
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L33  
Constant Speed  
Non-Clog Pump  
6B3B / 6C3B / 6D3B – 1760 RPM  
July, 2012



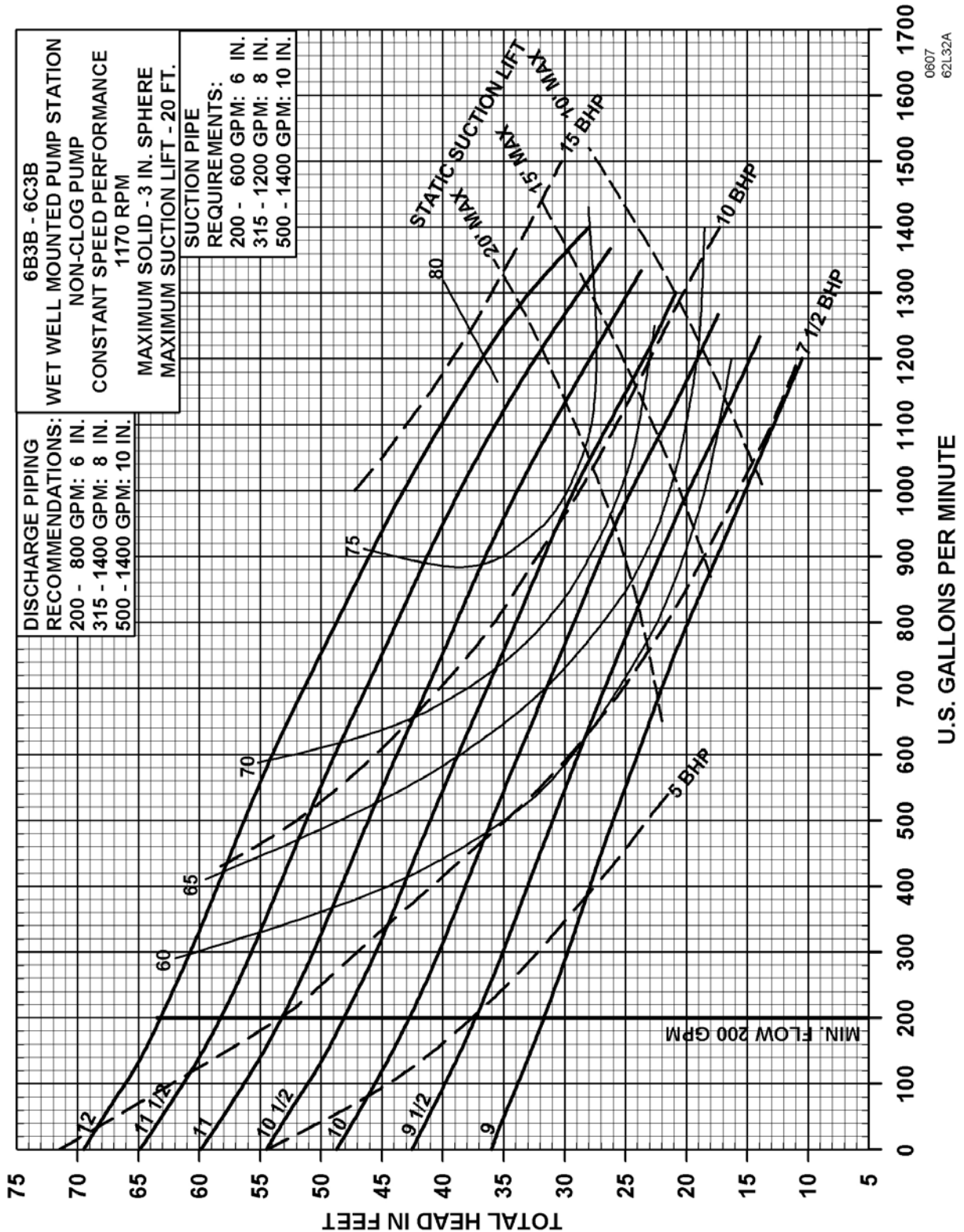
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L32  
Constant Speed  
Non-Clog Pump  
6B3B / 6C3B – 1170 RPM  
July, 2012



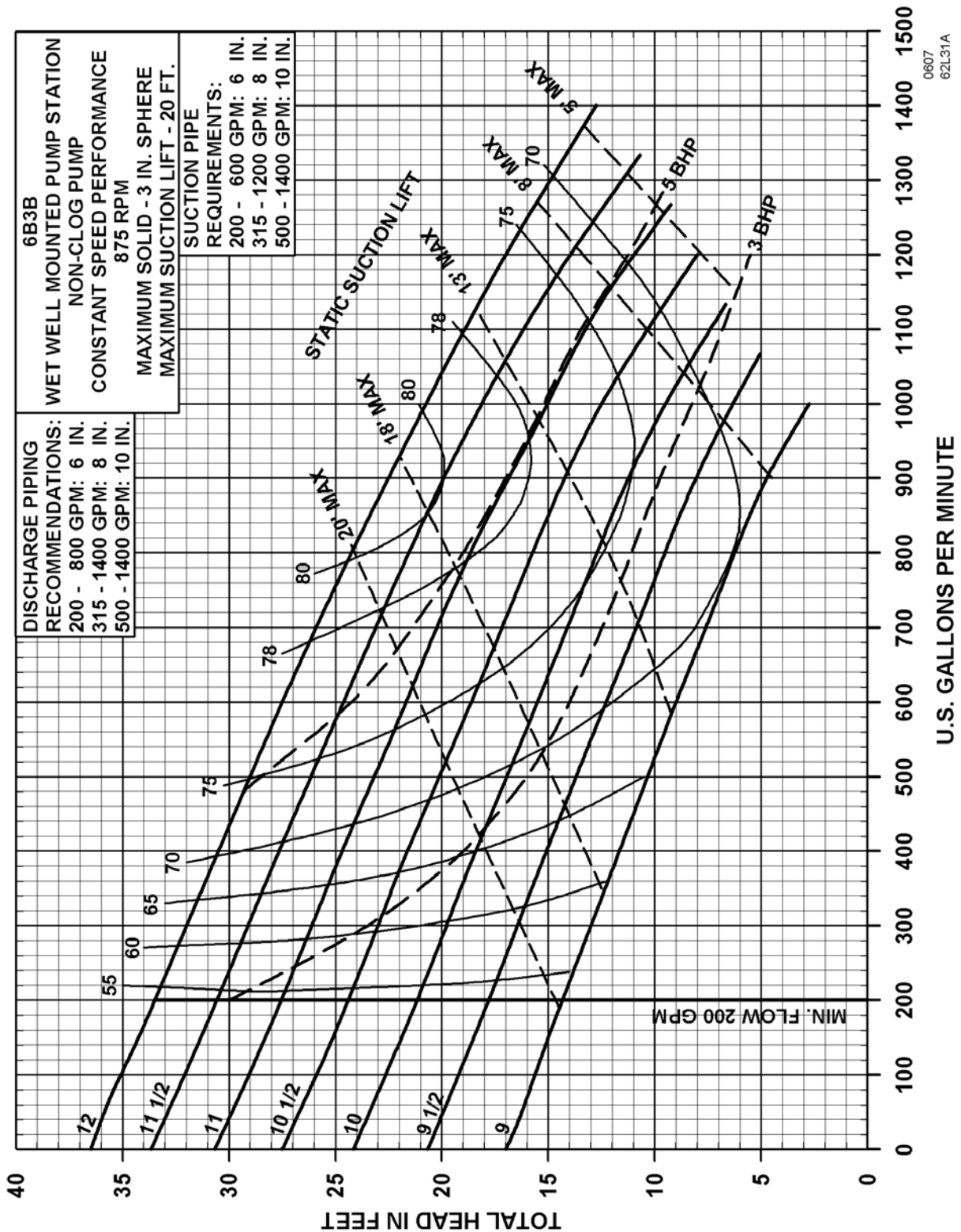
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L31  
Constant Speed  
Non-Clog Pump  
6B3B – 875 RPM  
July, 2012



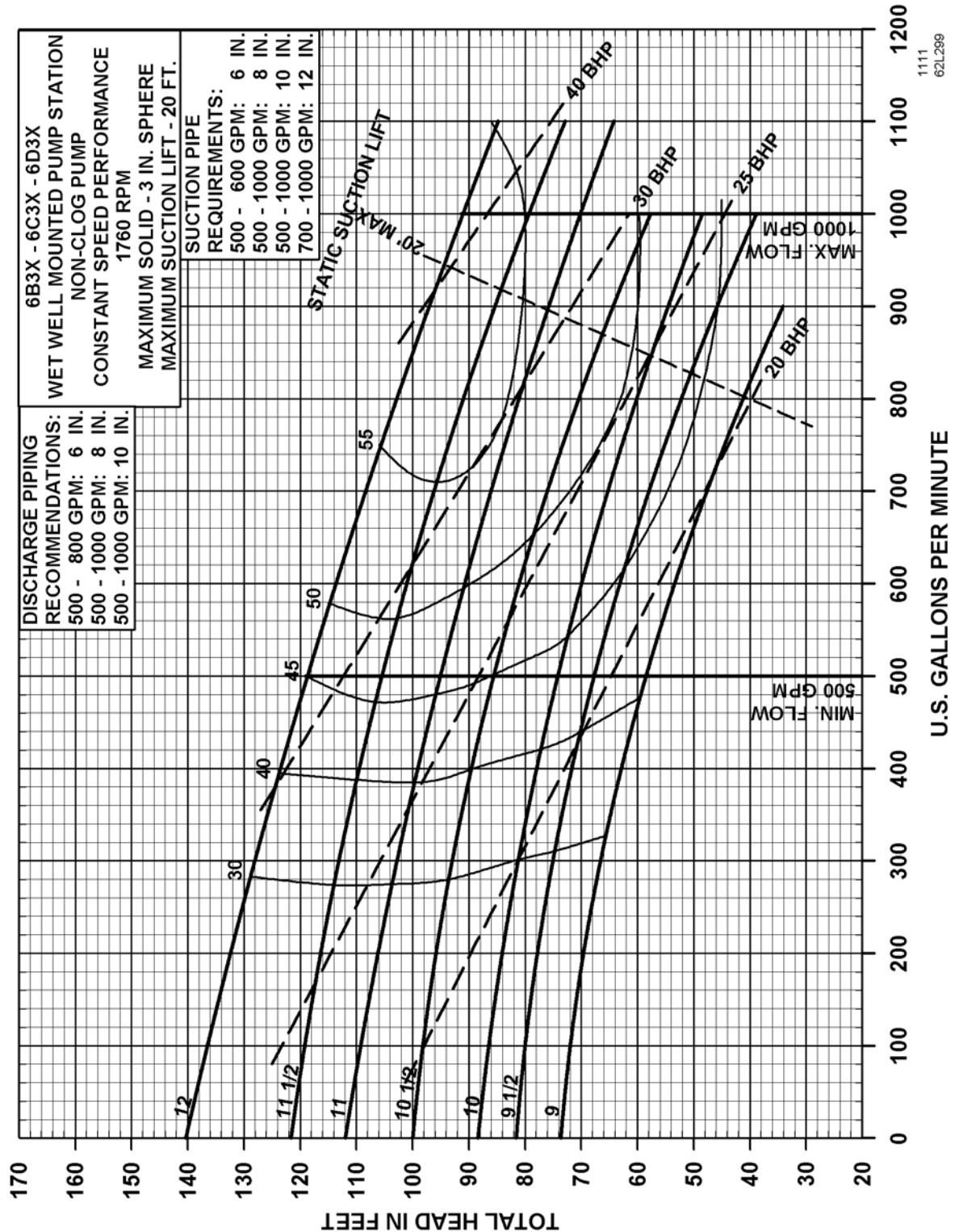
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L299  
Constant Speed  
Non-Clog Pump  
6B3X / 6C3X / 6D3X – 1760 RPM  
July, 2012



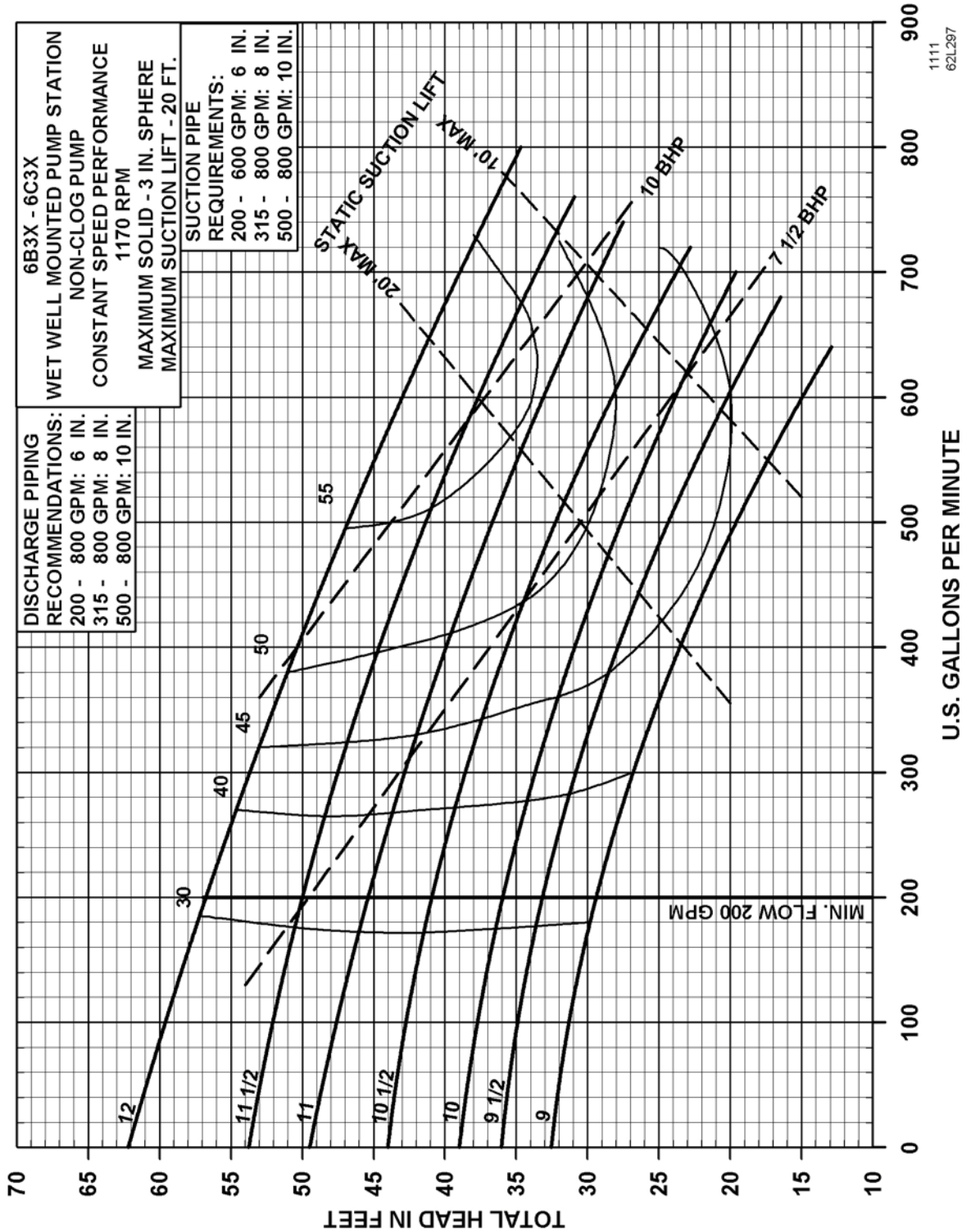
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L297  
Constant Speed  
Non-Clog Pump  
6B3X / 6C3X – 1170 RPM  
July, 2012





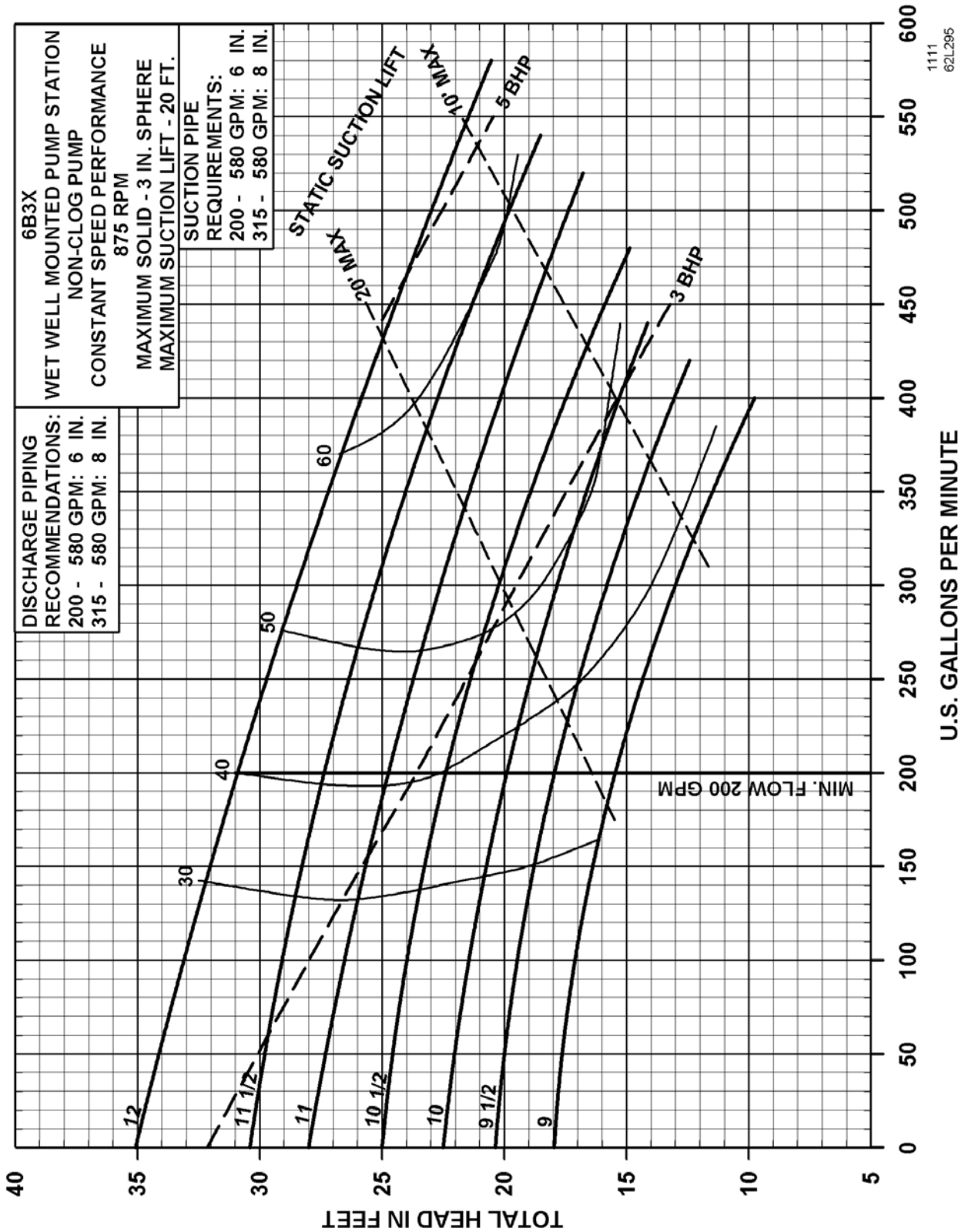
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L295  
Constant Speed  
Non-Clog Pump  
6B3X – 875 RPM  
July, 2012



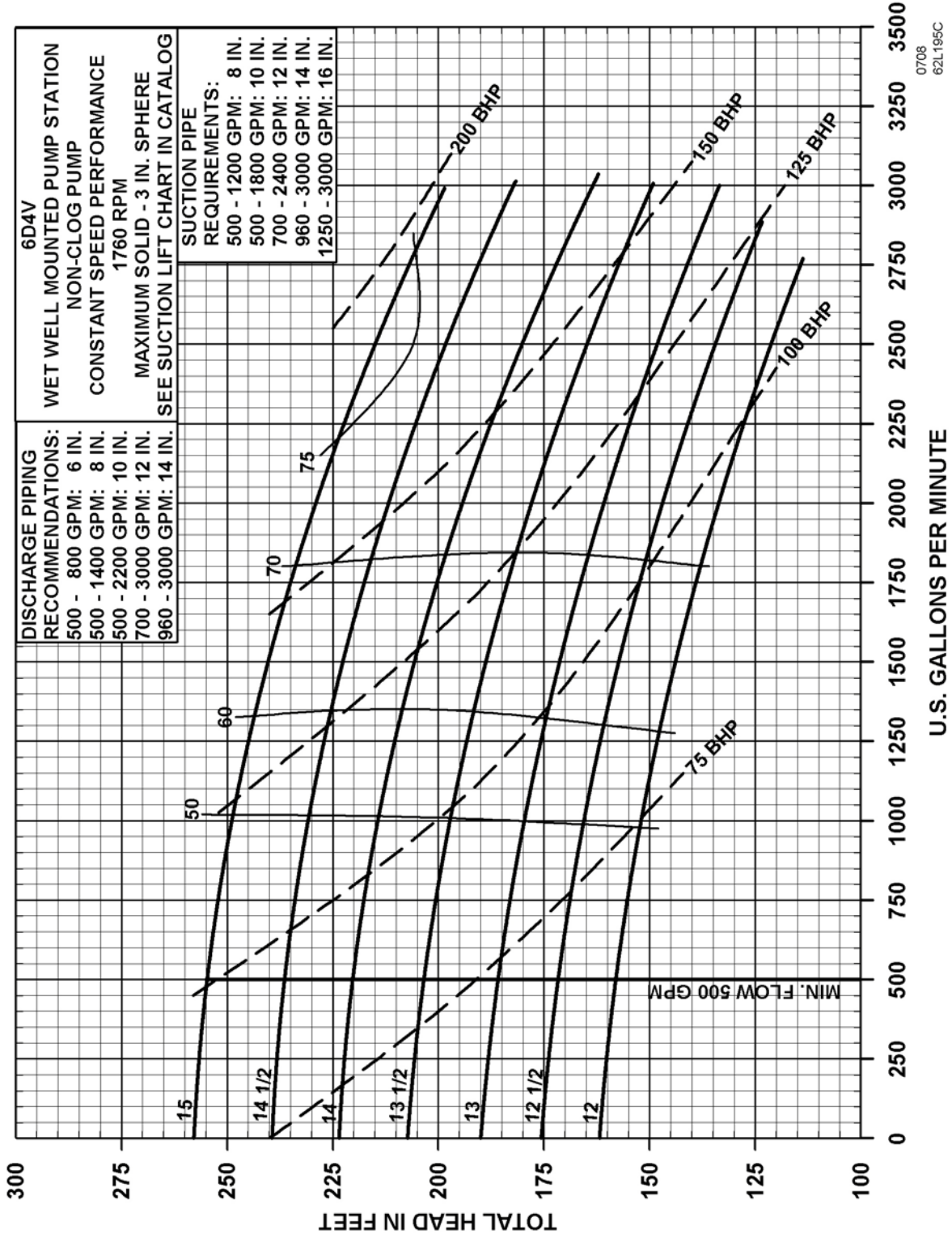
# ENGINEERING DATA



Smith & Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L195  
Constant Speed  
Non-Clog Pump  
6D4V – 1760 RPM  
July, 2012



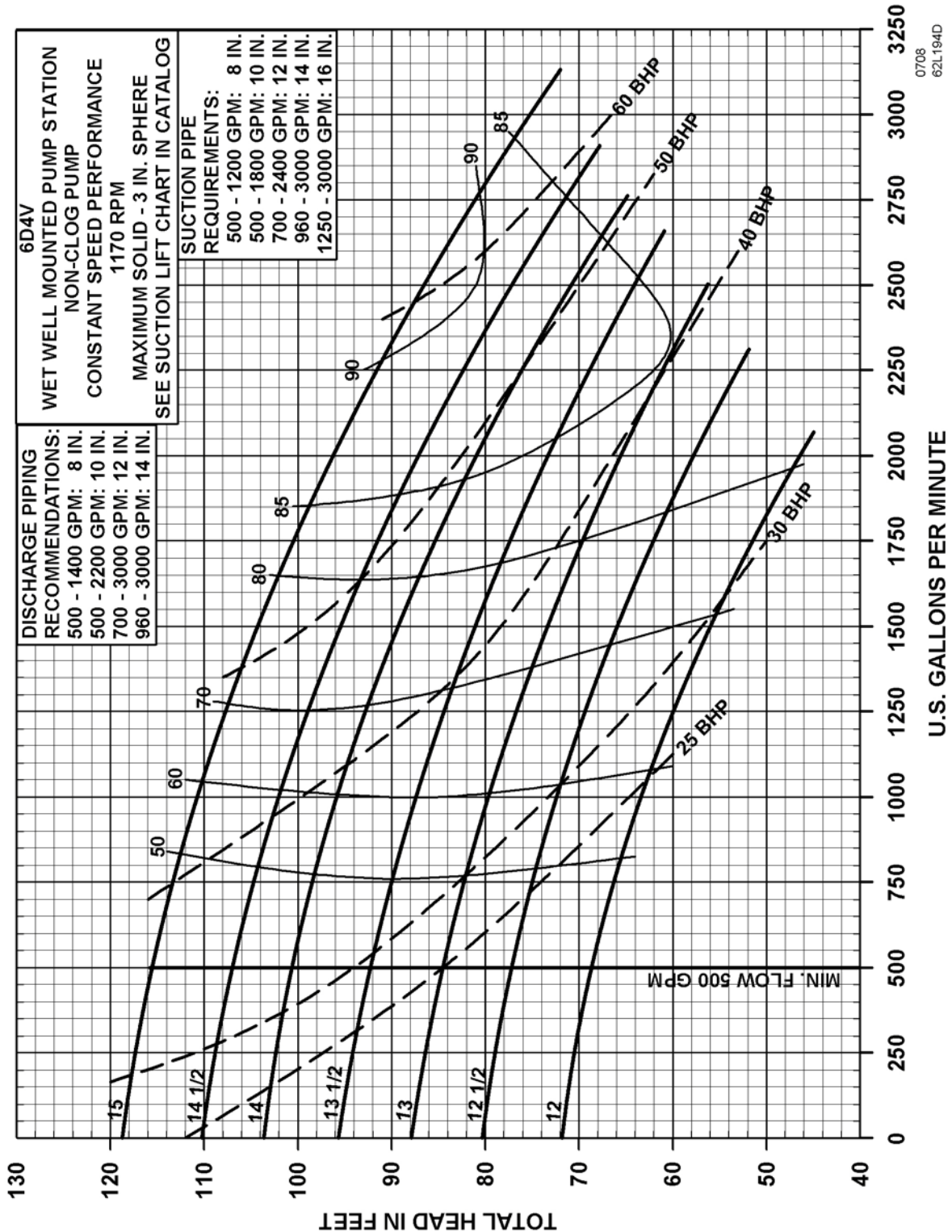
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L194  
Constant Speed  
Non-Clog Pump  
6D4V – 1170 RPM  
July, 2012



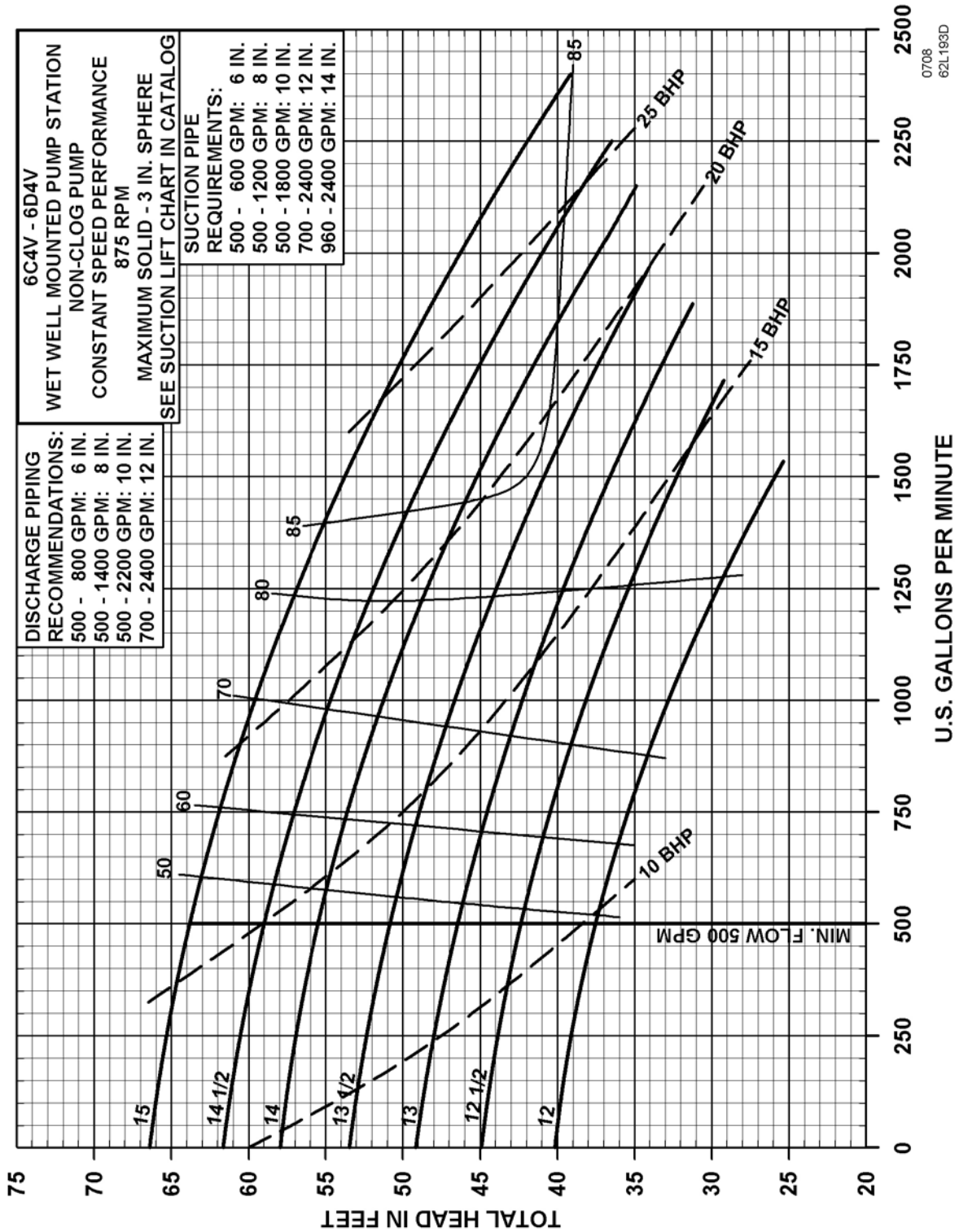
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L193  
Constant Speed  
Non-Clog Pump  
6C4V / 6D4V – 875 RPM  
July, 2012



# ENGINEERING DATA

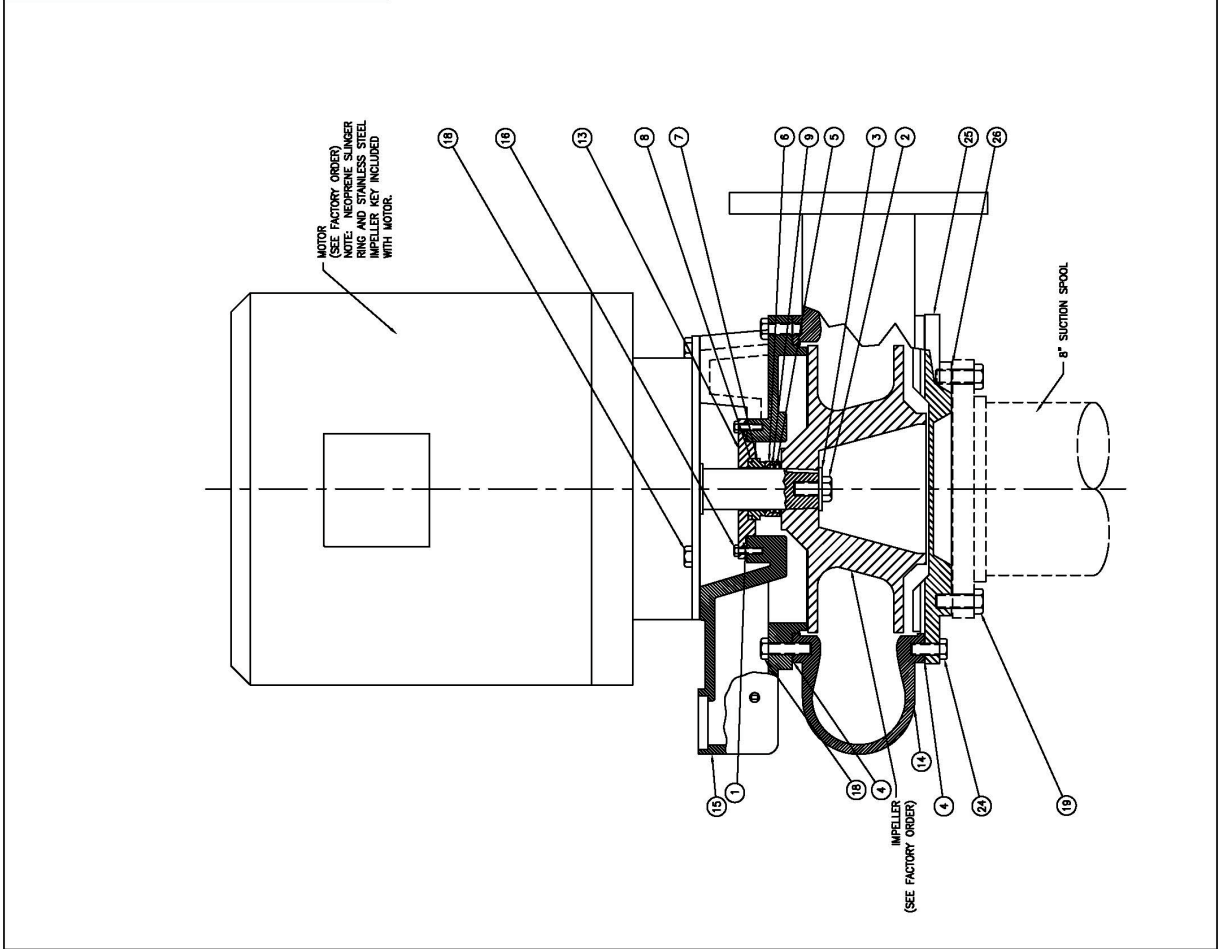


Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Pump Assembly Drawing  
8D4D  
Drawing 87B463  
July, 2012

Item Qty	U/I	Part Number	Rev	Description	Size	Wt. Ea
1	EA	80A146		SEAL HOLDER GASKET QUAD RING		
2	EA	80A87		IMPELLER BOLT		
3	EA	80A85		IMPELLER WASHER		
4	EA	80A88		VALUTE GASKET		
5	EA	80A85		SPRING		
6	EA	80A85		ROTATING CERAMIC SEAL		
7	EA	80A82		STATIONARY CARBON SEAL		
8	EA	80A54		QUAD RING		
9	EA	80A63		7/8" RING		
13	EA	87B105		SEAL HOLDER		
14	EA	80D211		VALUTE		
15	EA	80B185P		MOTOR ADAPTER MODIFICATION		
16	EA	8L58ED		CAPSCREW, SS	1/2"-13 x 1 1/4"	
18	EA	8L20HF		CAPSCREW	5/8"-11 x 1 3/4"	
19	EA	8L20AG		CAPSCREW	3/4"-10 x 2"	
24	EA	8L20HE		CAPSCREW	5/8"-11 x 1 1/2"	
25	EA	80C155		FRONTHEAD		
26	EA	11L1D		GASKET		



NOTE:  
1. COPYRIGHT (C) 2004, 2005, 2006, 2007, 2008 SMITH & LOVELESS, INC. 87B463/D

DATE	BY	DESCRIPTION
10/07-7/10/08	JRB	ISSUED FOR PRODUCTION
10/07-6/12/07	RSD	REVISED
10/05-6/1/05	RSD	REVISED
10/05-5/17/05	NTS	REVISED

DATE	BY	DESCRIPTION
10/07-7/10/08	JRB	ISSUED FOR PRODUCTION
10/07-6/12/07	RSD	REVISED
10/05-6/1/05	RSD	REVISED
10/05-5/17/05	NTS	REVISED

DATE: 10/07-7/10/08  
BY: JRB  
DESCRIPTION: ISSUED FOR PRODUCTION

DATE: 10/07-6/12/07  
BY: RSD  
DESCRIPTION: REVISED

DATE: 10/05-6/1/05  
BY: RSD  
DESCRIPTION: REVISED

DATE: 10/05-5/17/05  
BY: NTS  
DESCRIPTION: REVISED

FILE: \SUN\87B463.D  
SCALE: AS SHOWN  
REV: D

PUMP ASSEMBLY  
8D4D

SMITH & LOVELESS, INC.

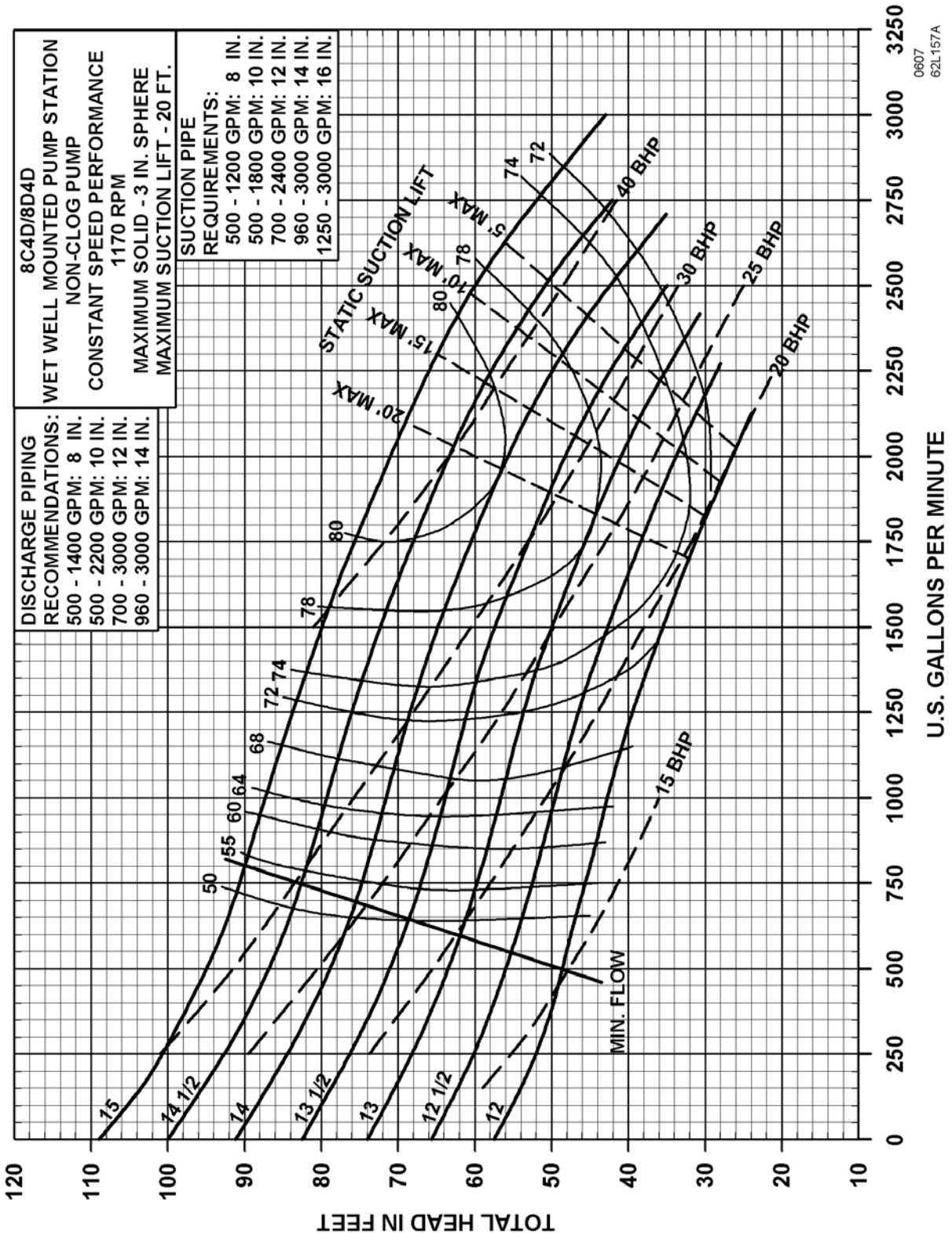
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L157  
Constant Speed  
Non-Clog Pump  
8C4D / 8D4D – 1170 RPM  
July, 2012



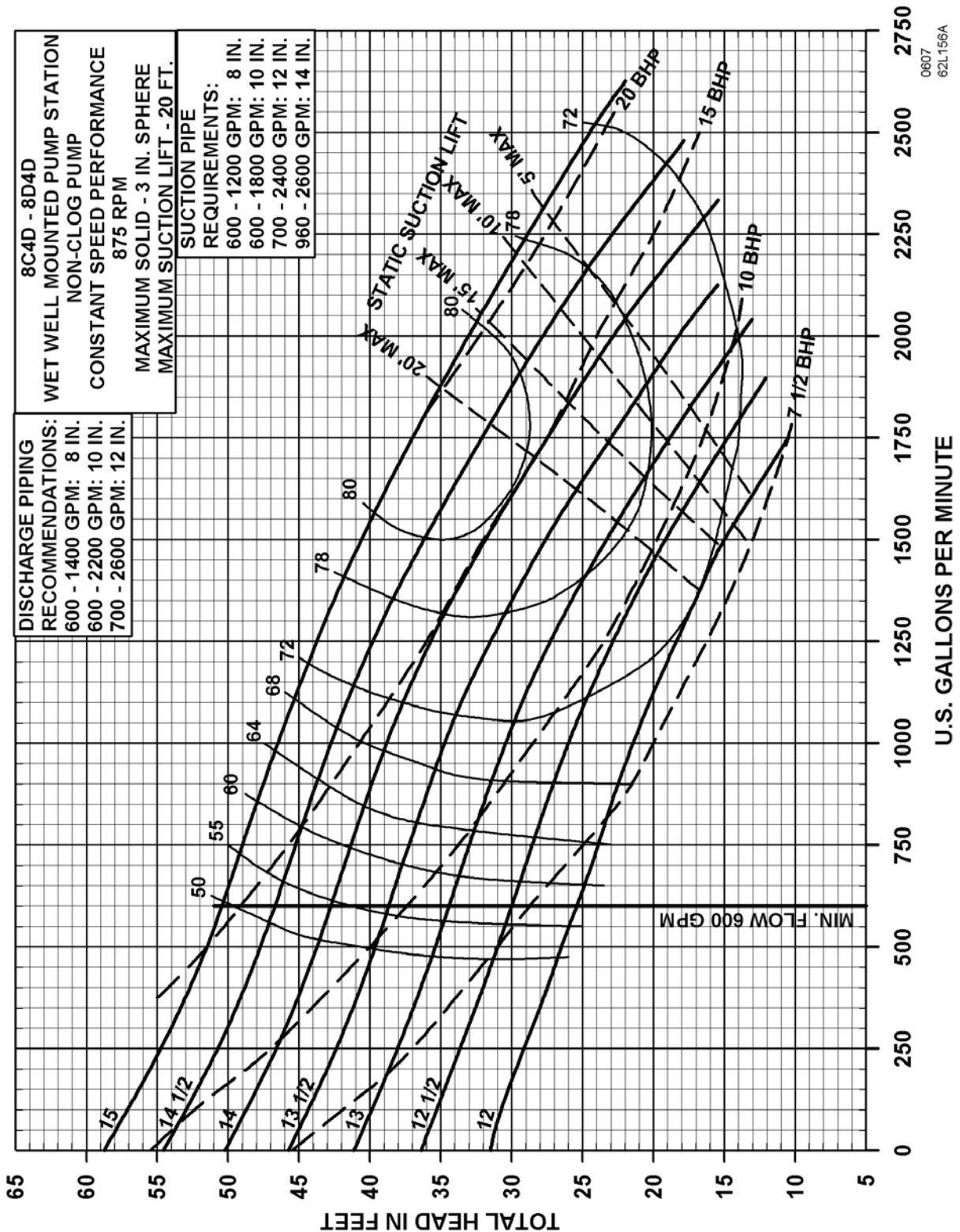
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L156  
Constant Speed  
Non-Clog Pump  
8C4D / 8D4D – 875 RPM  
July, 2012



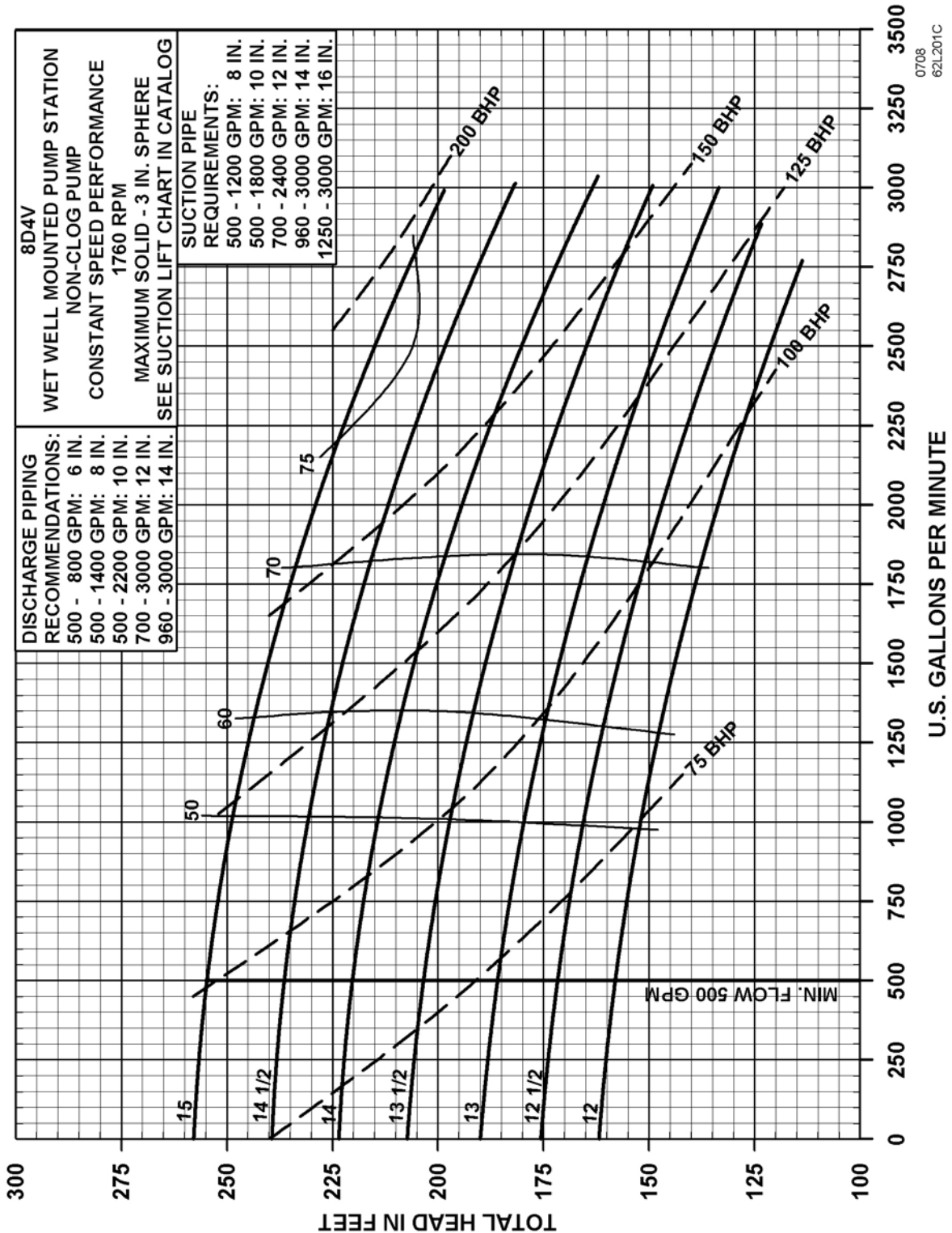
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L201  
Constant Speed  
Non-Clog Pump  
8D4V – 1760 RPM  
July, 2012



0708  
62L201C



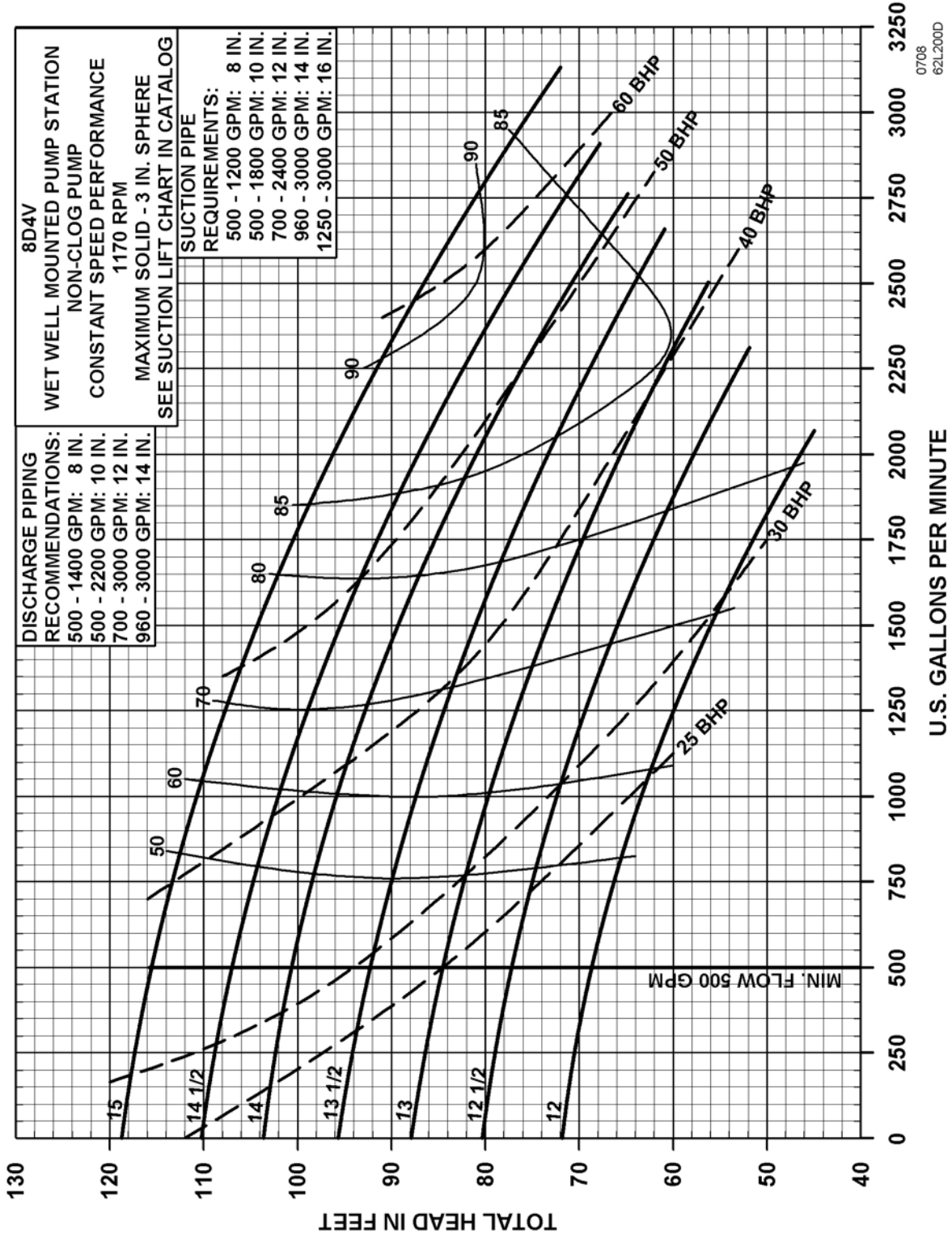
# ENGINEERING DATA



Smith & Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L200  
Constant Speed  
Non-Clog Pump  
8D4V – 1170 RPM  
July, 2012



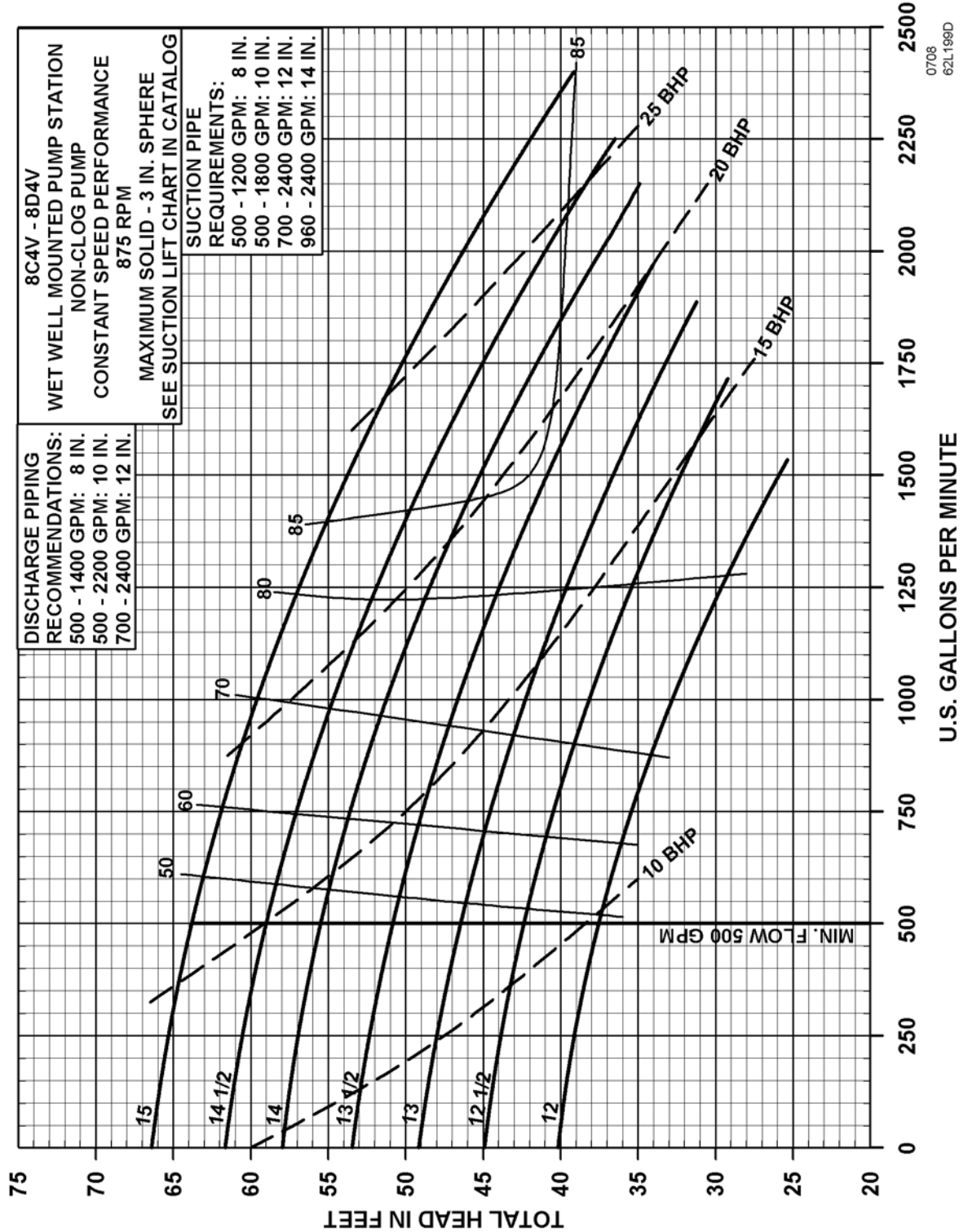
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Prime Pump  
Performance Curve 62L199  
Constant Speed  
Non-Clog Pump  
8C4V / 8D4V – 875 RPM  
July, 2012



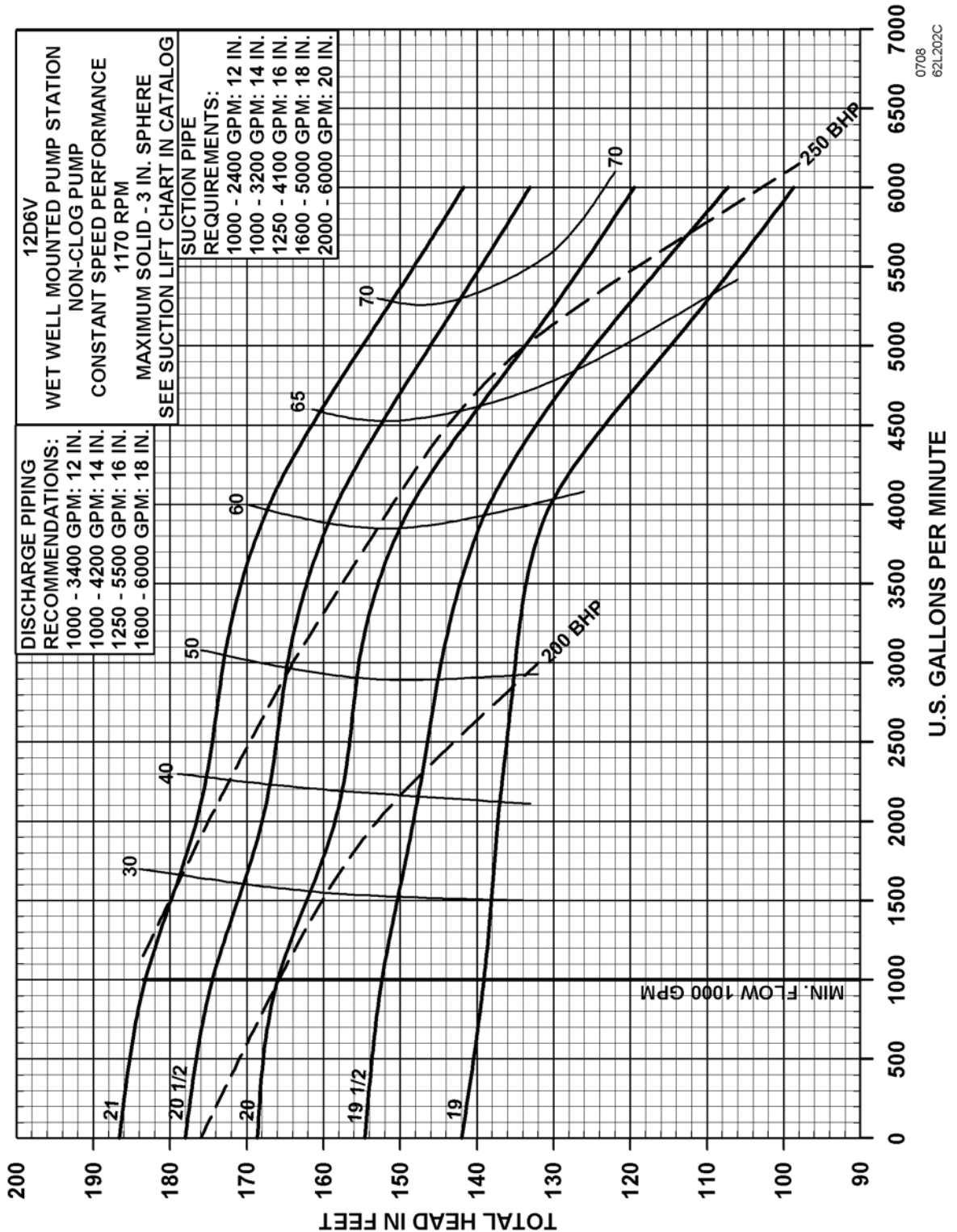
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L202  
Constant Speed  
Non-Clog Pump  
12D6V – 1170 RPM  
July, 2012



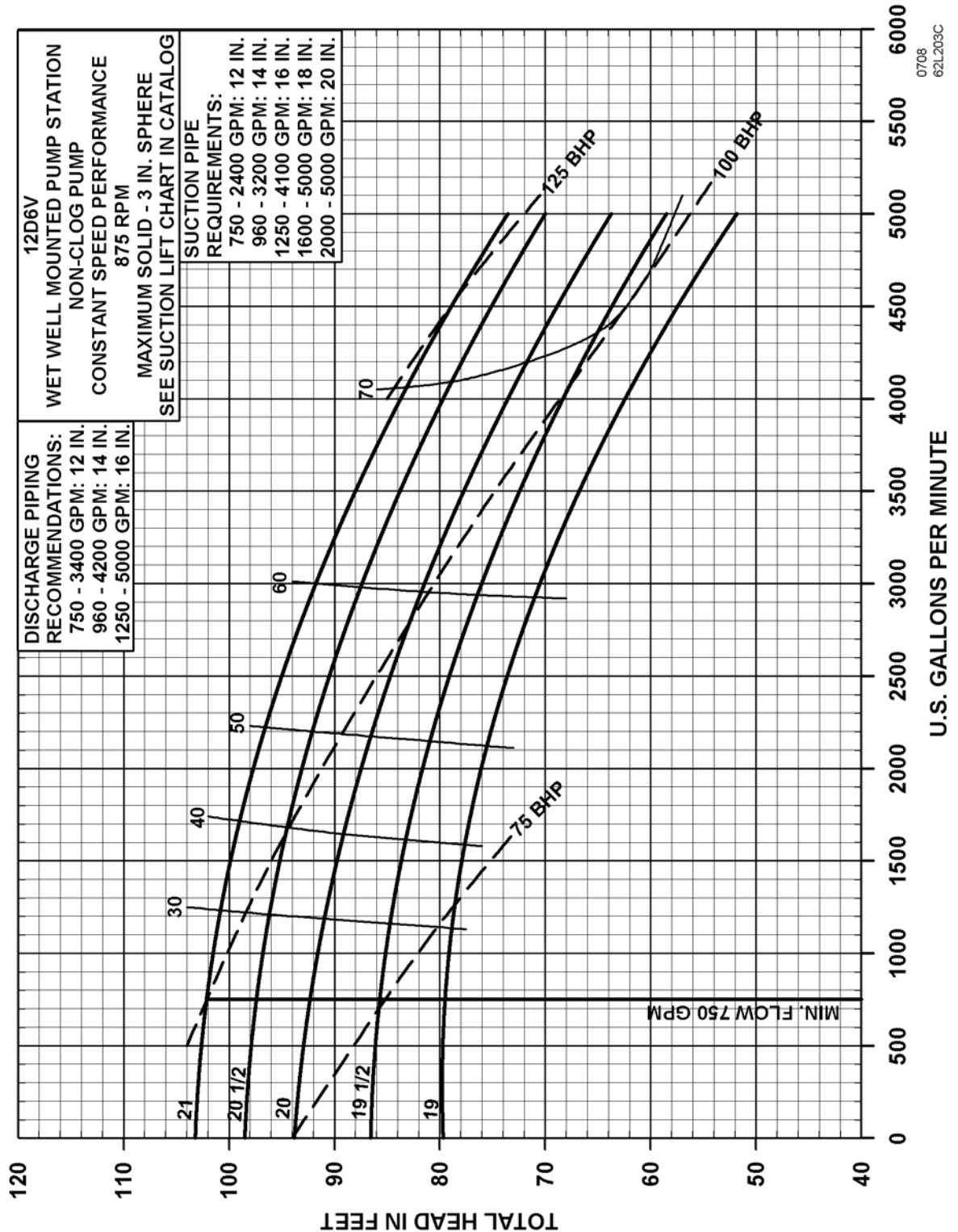
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L203  
Constant Speed  
Non-Clog Pump  
12D6V – 875 RPM  
July, 2012



0708  
62L203C

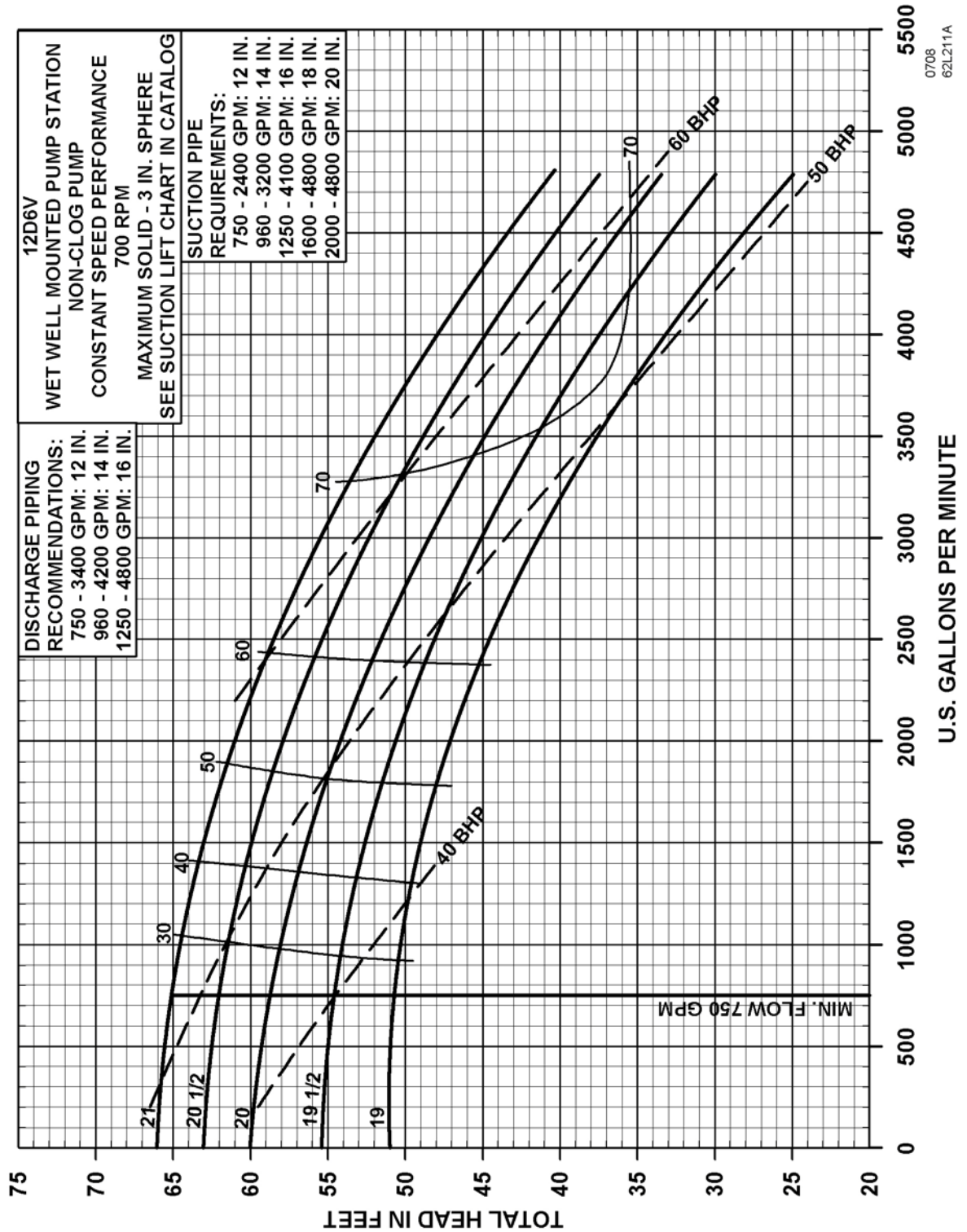
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L211  
Constant Speed  
Non-Clog Pump  
12D6V – 700 RPM  
July, 2012



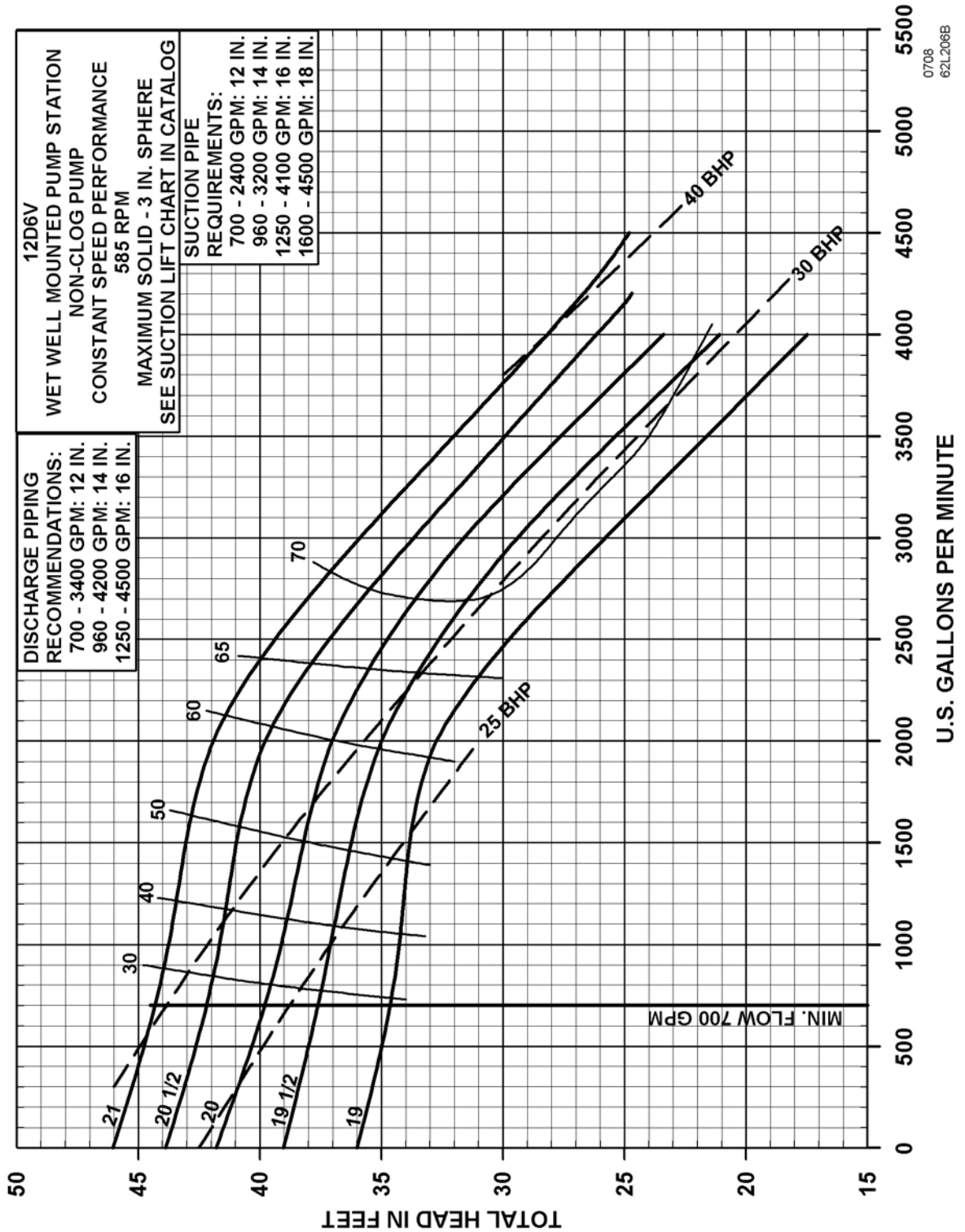
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L206  
Constant Speed  
Non-Clog Pump  
12D6V – 585 RPM  
July, 2012



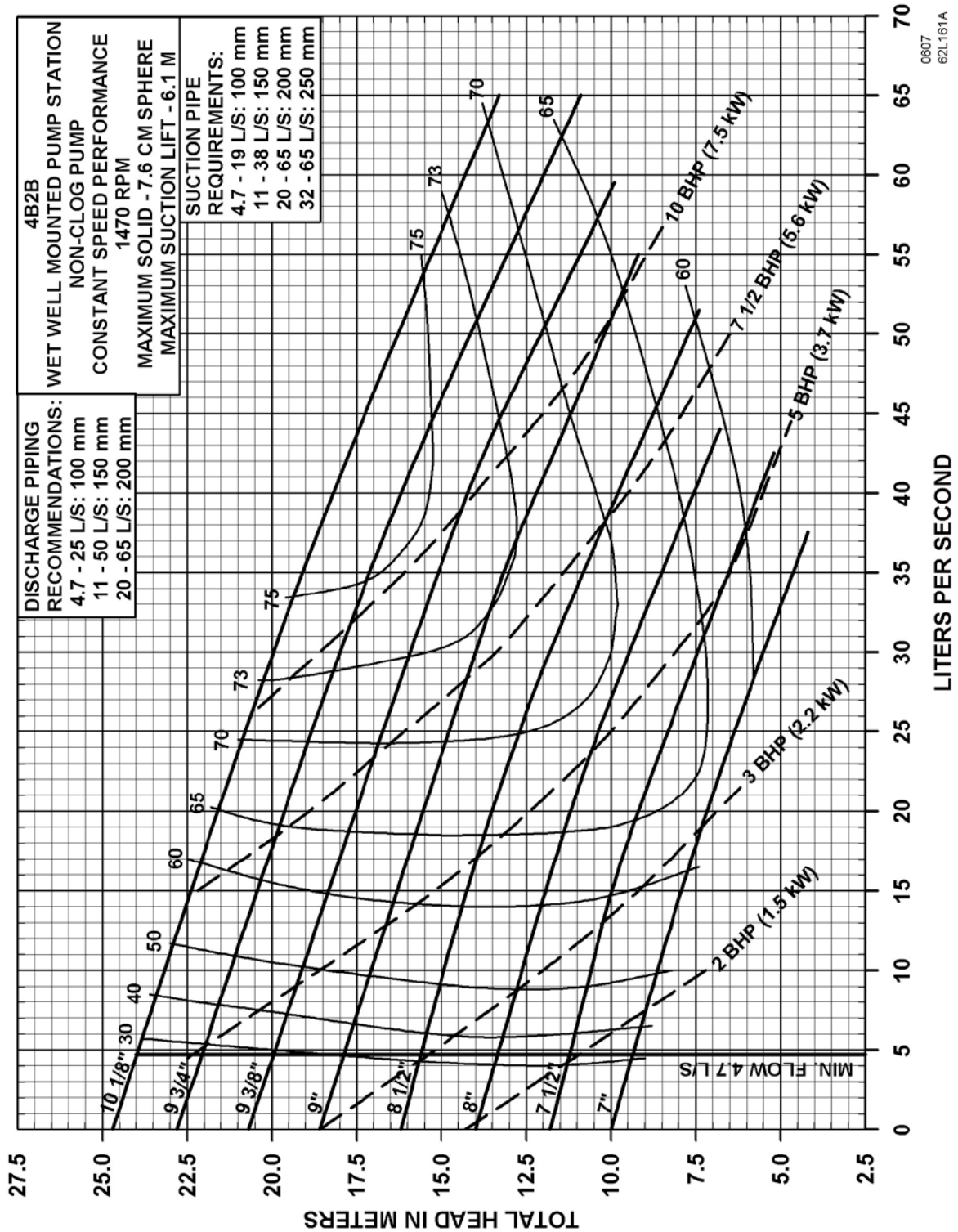
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L161  
Constant Speed  
Non-Clog Pump  
4B2B - 1470 RPM  
July, 2012



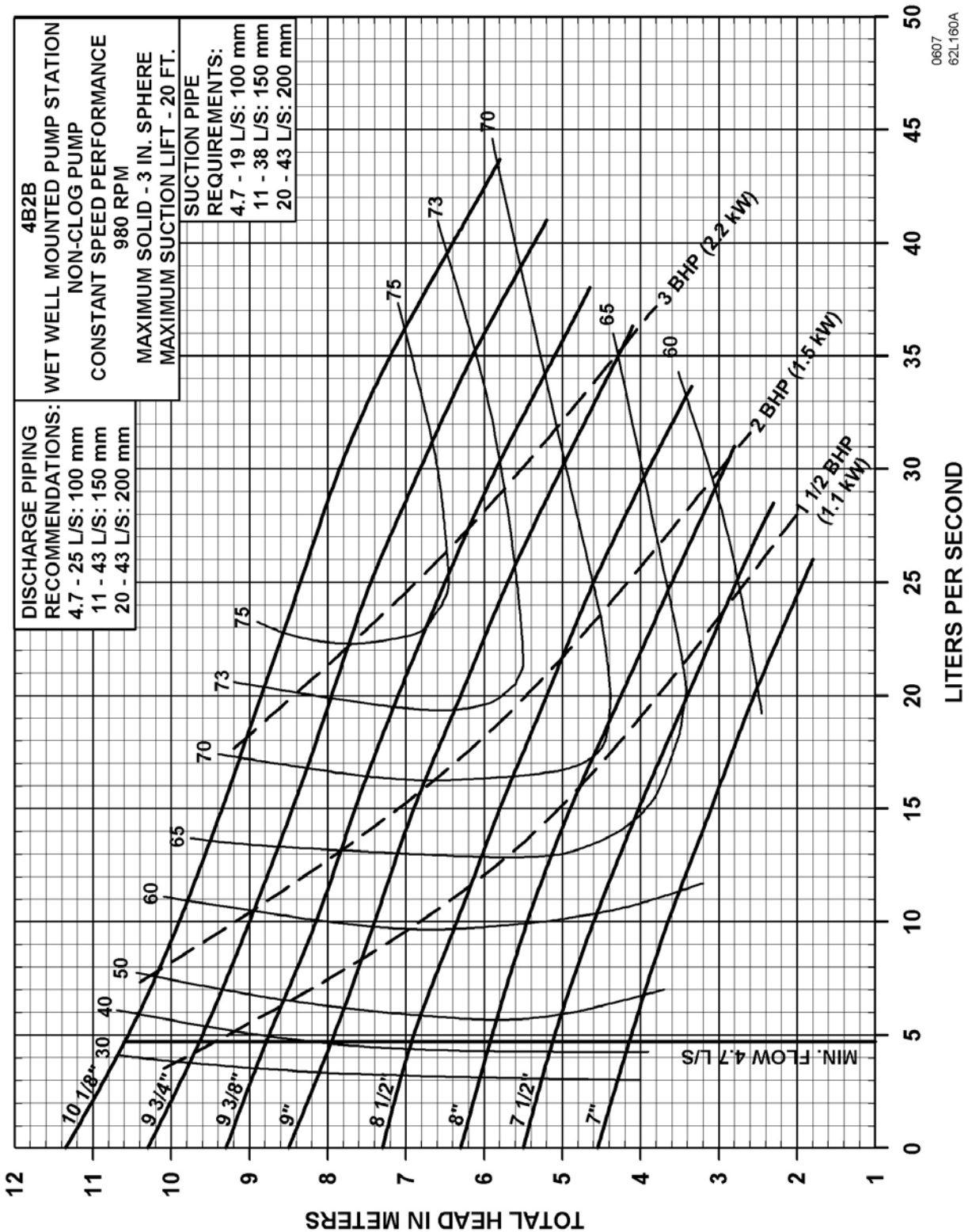
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L160  
Constant Speed  
Non-Clog Pump  
4B2B – 980 RPM  
July, 2012





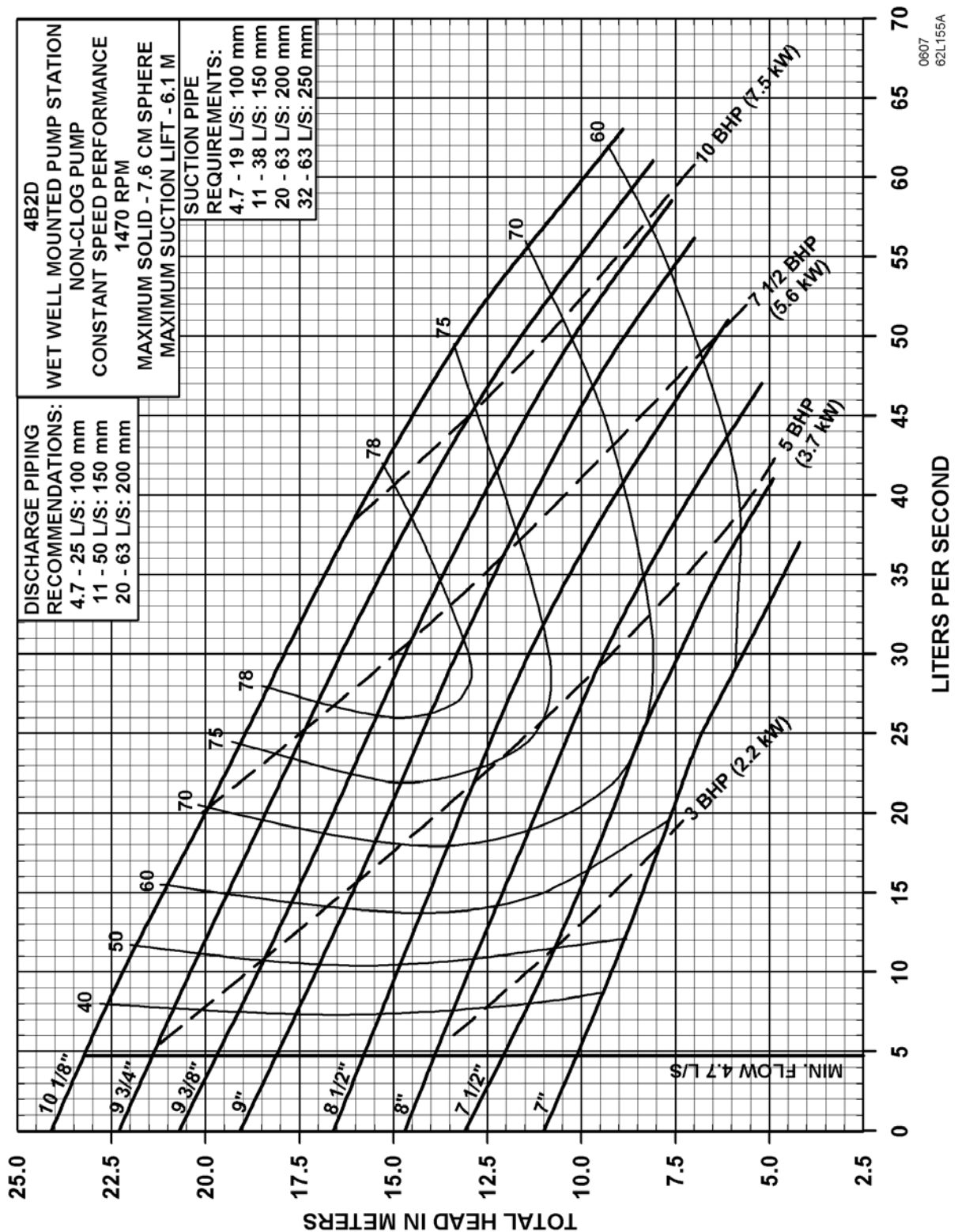
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L155  
Constant Speed  
Non-Clog Pump  
4B2D – 1470 RPM  
July, 2012



0607  
62L155A

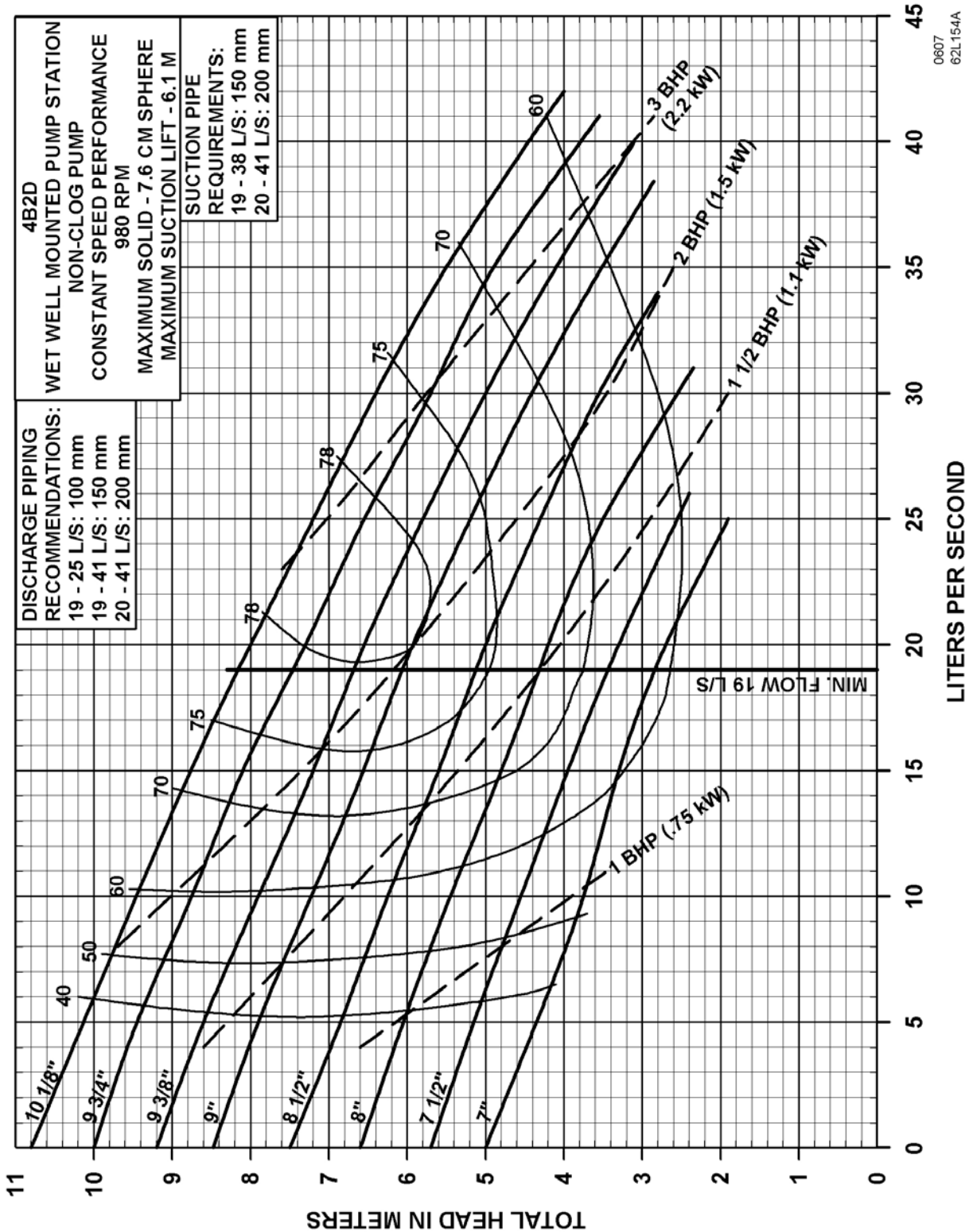
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L154  
Constant Speed  
Non-Clog Pump  
4B2D – 980 RPM  
July, 2012



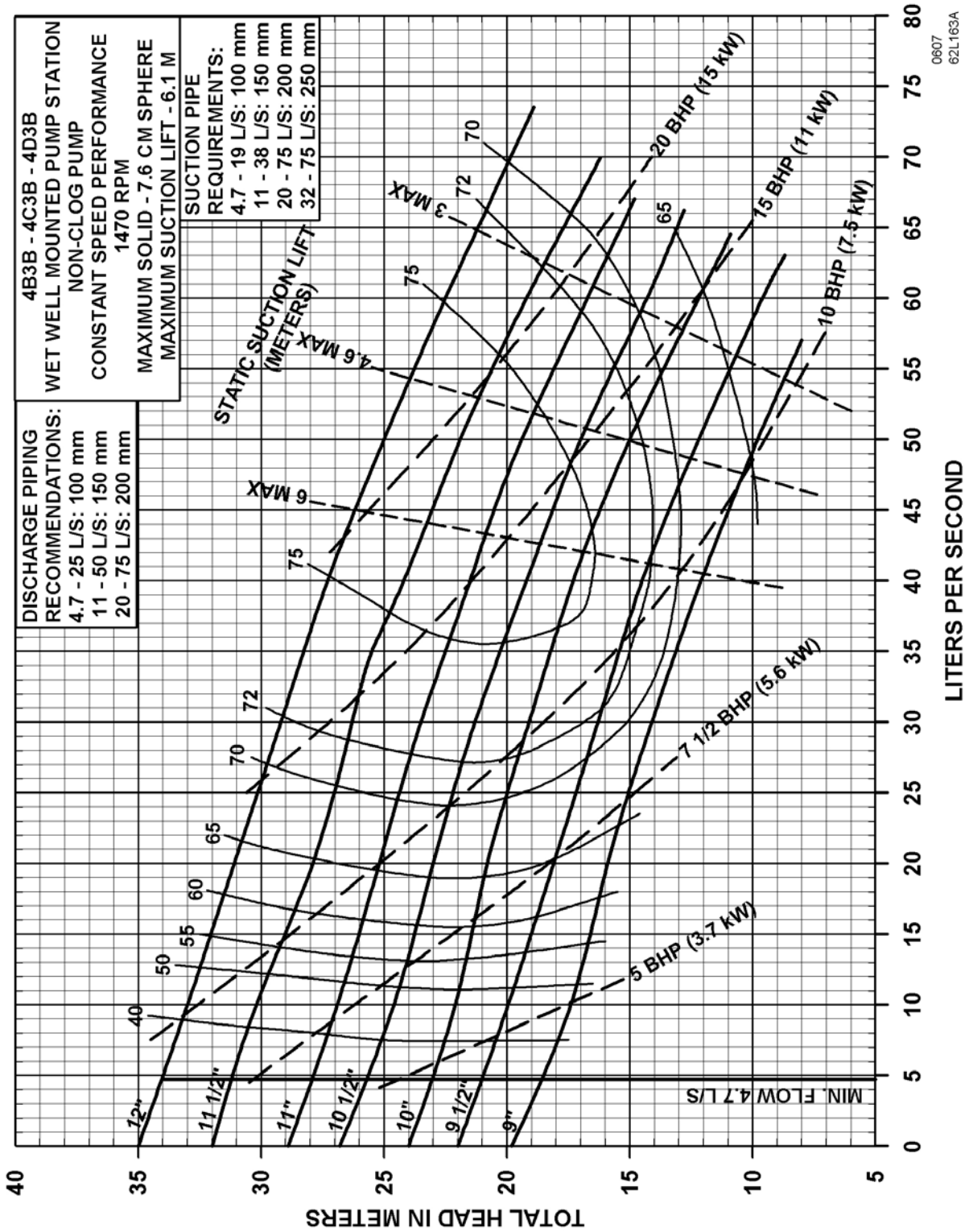
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L163  
Constant Speed  
Non-Clog Pump  
4B3B / 4C3B / 4D3B – 1470 RPM  
July, 2012



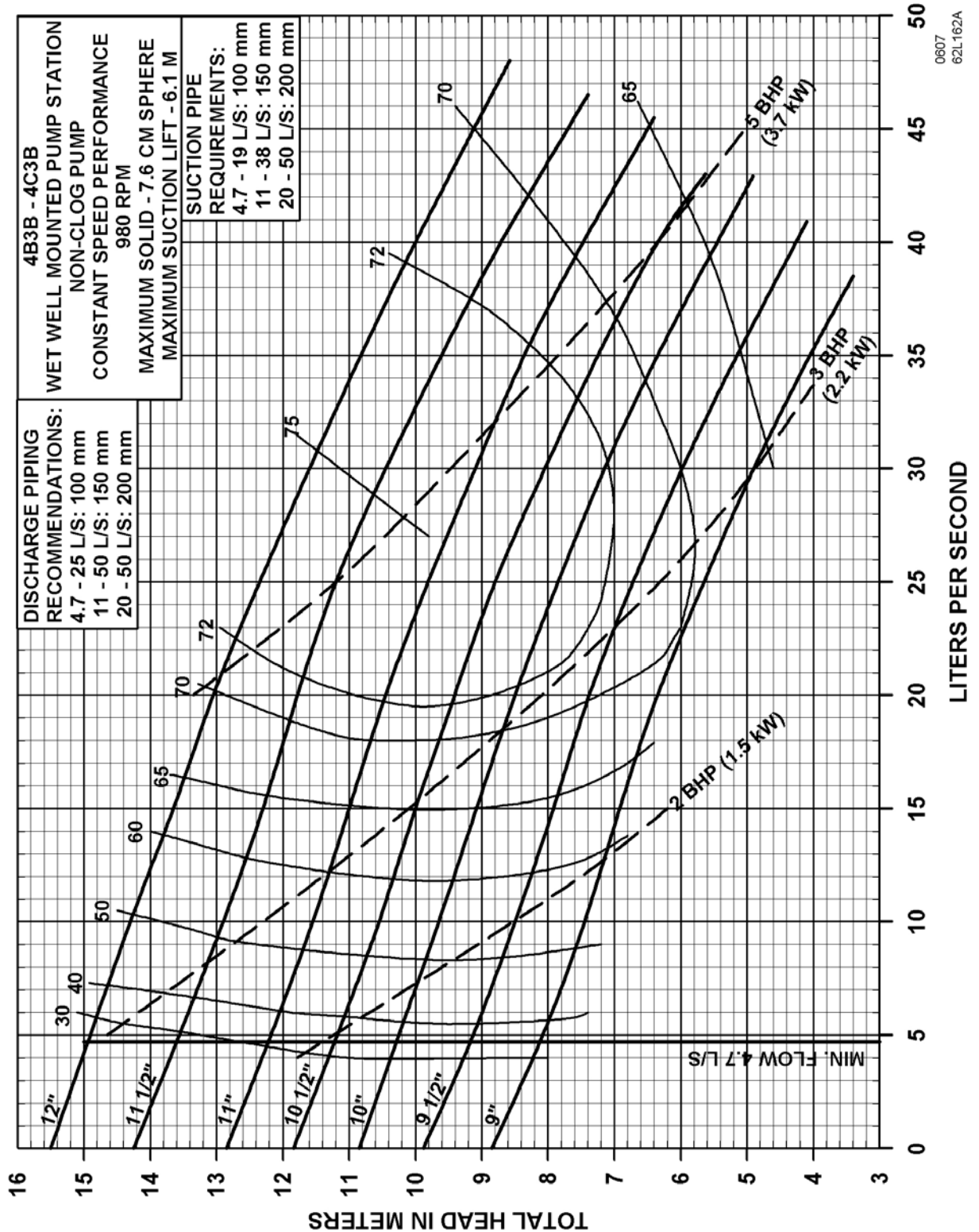
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L162  
Constant Speed  
Non-Clog Pump  
4B3B / 4C3B – 980 RPM  
July, 2012



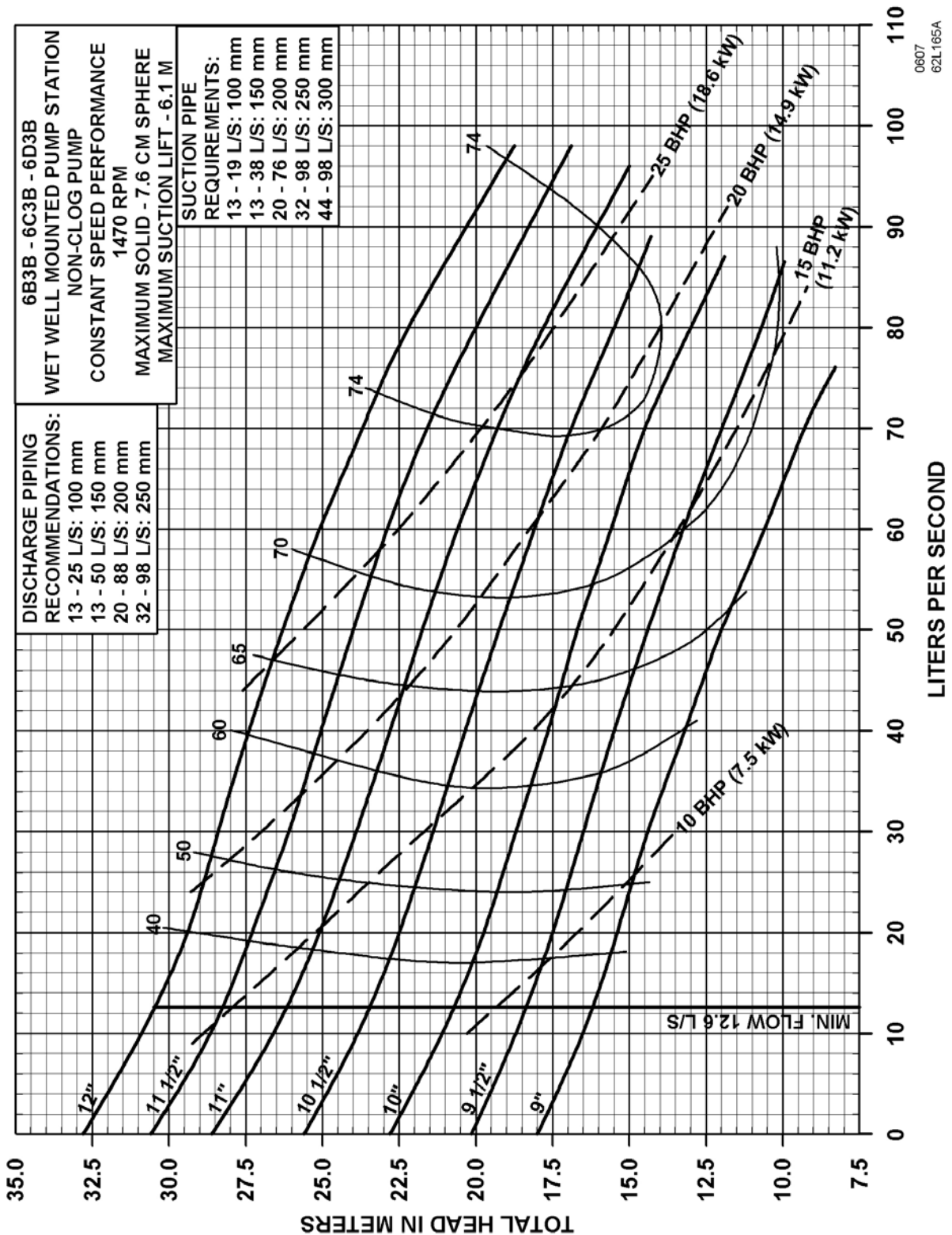
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L165  
Constant Speed  
Non-Clog Pump  
6B3B / 6C3B / 6D3B – 1470 RPM  
July, 2012



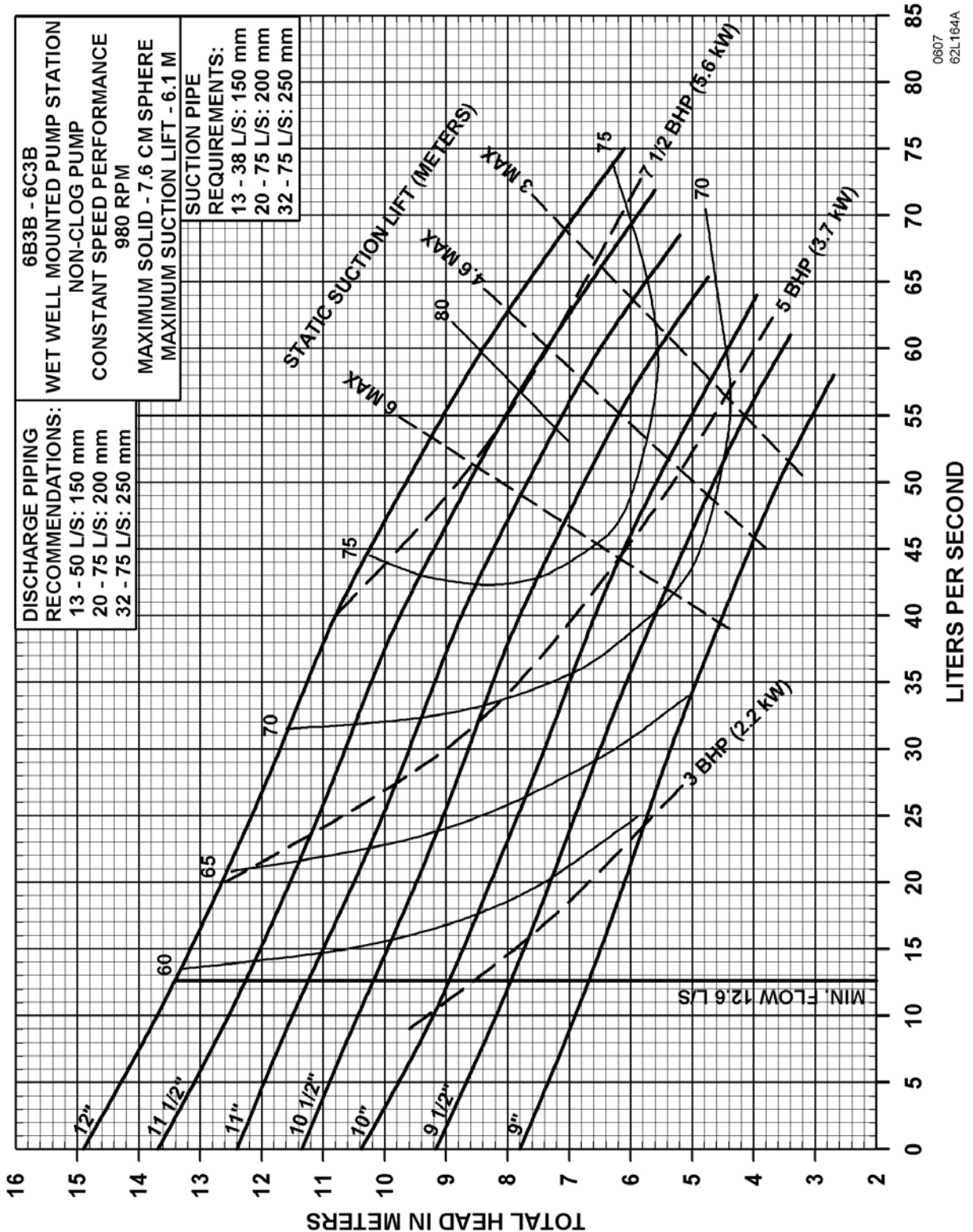
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Primed Pump  
Performance Curve 62L164  
Constant Speed  
Non-Clog Pump  
6B3B / 6C3B – 980 RPM  
July, 2012



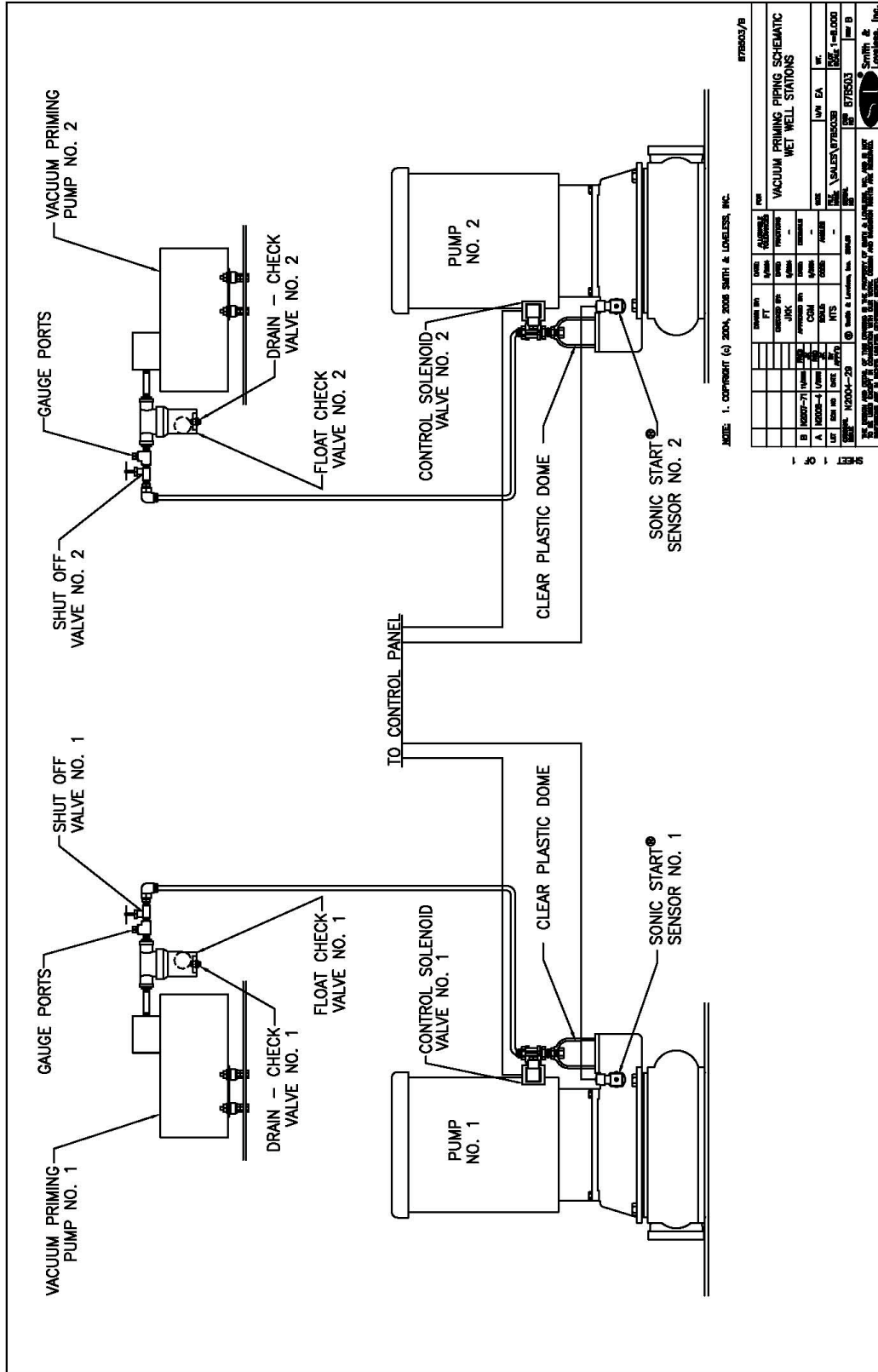
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Priming Diagram  
Vacuum Primed Pump Station  
Drawing 87B503  
July, 2012



REV		DATE	BY	CHKD	DESCRIPTION
1	0				VACUUM PRIMING PIPING SCHEMATIC
2	1				WET WELL STATIONS

DATE	REV	BY	CHKD	DESCRIPTION
07/10/12	1	SMITH	LOVELESS	VACUUM PRIMING PIPING SCHEMATIC

PROJECT NO.	87B503
DATE	07/10/12
BY	SMITH
CHKD	LOVELESS

SMITH & LOVELESS, INC.

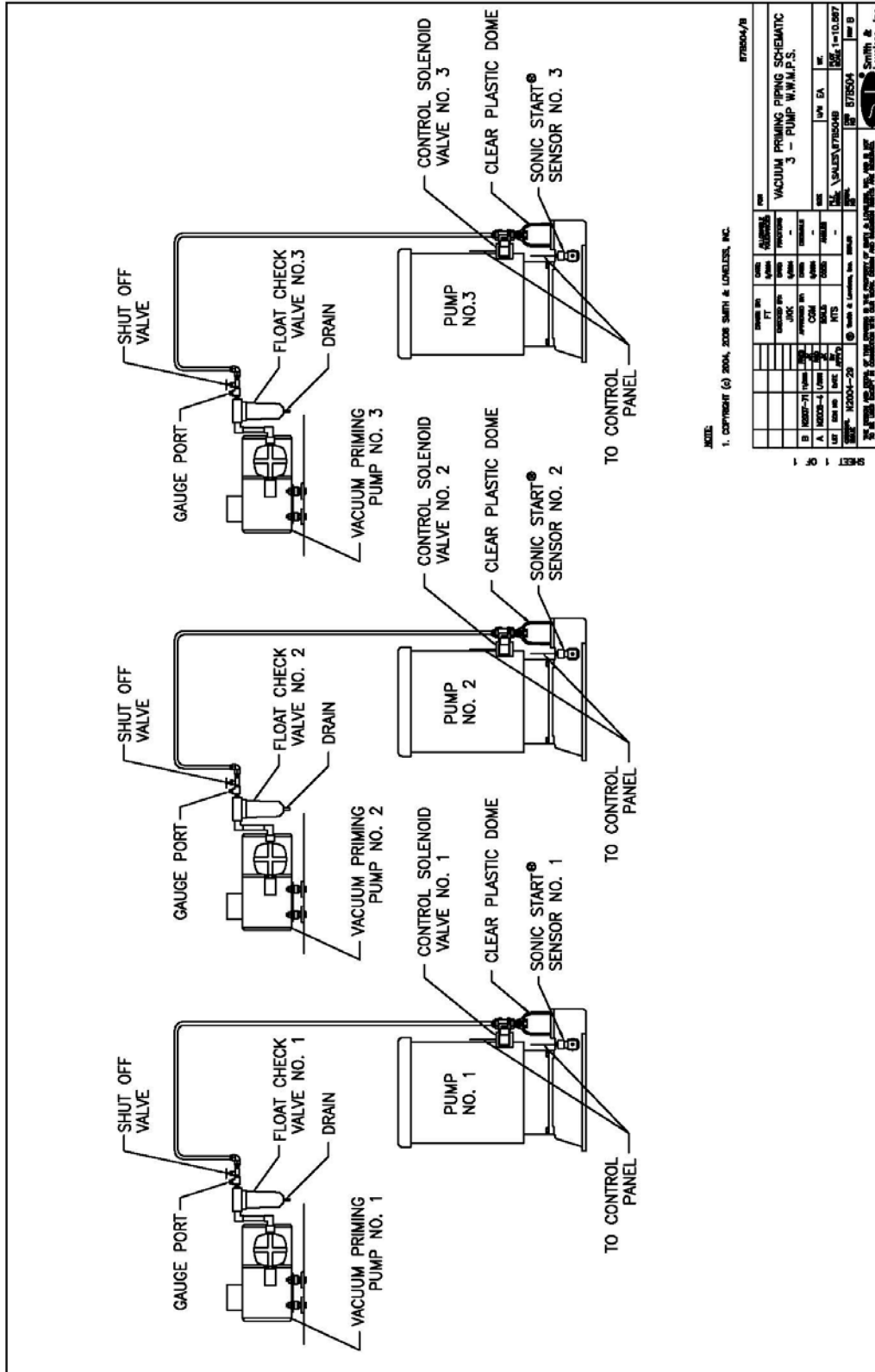
# ENGINEERING DATA



Smith &  
Loveless, Inc.®

14040 West Santa Fe Trail Drive  
Lenexa, Kansas 66215-1284

Vacuum Priming Diagram  
Vacuum Primed Pump Station  
Drawing 87B504  
July, 2012



REVISIONS  
1. CORRECT © 2004, 2008 SMITH & LOVELESS, INC.

NO.	DATE	BY	CHKD.	DESCRIPTION
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