
Appendix E: Pump Curves

This appendix contains complete technical booklets for the Bell & Gossett Series e-80 inline centrifugal pumps and Series e-1531 end suction centrifugal pumps. This information is included here for purposes of learning how to use the pump curves. Permission has been granted by Xylem, Inc. to include these pump curves in this textbook.

Series e-80

IN-LINE MOUNTED CENTRIFUGAL PUMP PERFORMANCE CURVES – 60 HZ



Series e-1531

CLOSED COUPLED CENTRIFUGAL PUMP PERFORMANCE CURVES – 60 HZ

References

- Xylem, Inc. 2015. *Series e-1531: Closed coupled centrifugal pump curves - 60 Hz*. Morton Grove, Illinois, USA: Bell & Gossett.
- Xylem, Inc. 2016. *Series e-80: In-line mounted centrifugal pump performance curves - 60 Hz*. Morton Grove, Illinois, USA: Bell & Gossett.

CURVES
B-193B



Series e-80

IN-LINE MOUNTED CENTRIFUGAL PUMP PERFORMANCE CURVES – 60 HZ

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Series e-80

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USEFUL PUMP FORMULAS

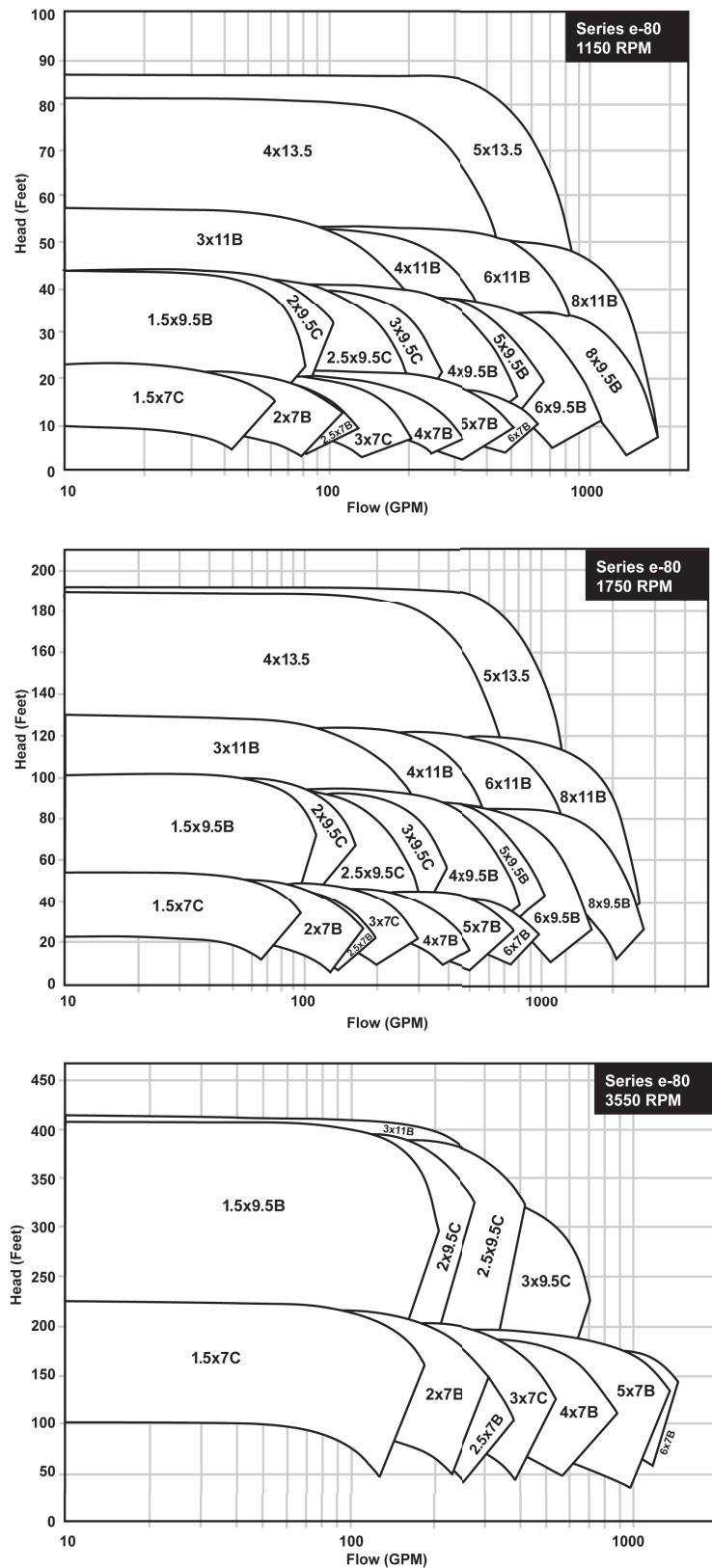
$$\begin{aligned}
 \text{Pressure} &= \frac{\text{Head (Feet)} \times \text{Specific Gravity}}{2.31} \\
 \text{Head} &= \frac{\text{Pressure (PSI)} \times 2.31}{\text{Specific Gravity}} \\
 \text{Vacuum} &= \frac{\text{Dynamic Suction Lift (Feet)} \times .883}{\text{Specific Gravity}} \\
 (\text{Inches of Mercury}) & \\
 \text{Horsepower} &= \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960 \times \text{Pump Efficiency}} \\
 (\text{Brake}) & \\
 \text{Horsepower} &= \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960} \\
 (\text{Water}) & \\
 \text{Efficiency} &= \frac{\text{Horsepower (Water)}}{\text{Horsepower (Brake)}} \times 100 \text{ Per Cent} \\
 (\text{Pump}) & \\
 \text{NPSH} &= \text{Positive Factors} - \text{Negative Factors} \\
 (\text{Available}) &
 \end{aligned}$$

Affinity Laws: Effect of change of speed or impeller diameter on centrifugal pumps.

	GPM Capacity	Ft. Head	BHP
Impeller Diameter Change	$Q_2 = \frac{D_2}{D_1} Q_1$	$H_2 = \left(\frac{D_2}{D_1}\right)^2 H_1$	$P_2 = \left(\frac{D_2}{D_1}\right)^3 P_1$
Speed Change	$Q_2 = \frac{\text{RPM}_2}{\text{RPM}_1} Q_1$	$H_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^2 H_1$	$P_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^3 P_1$

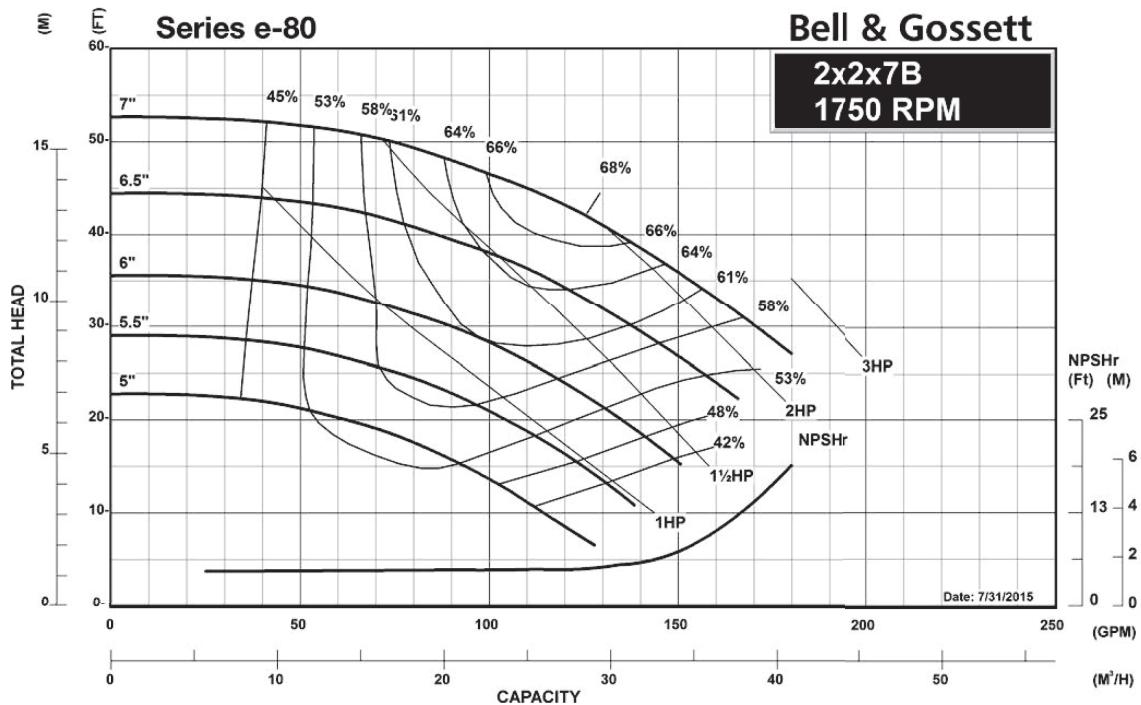
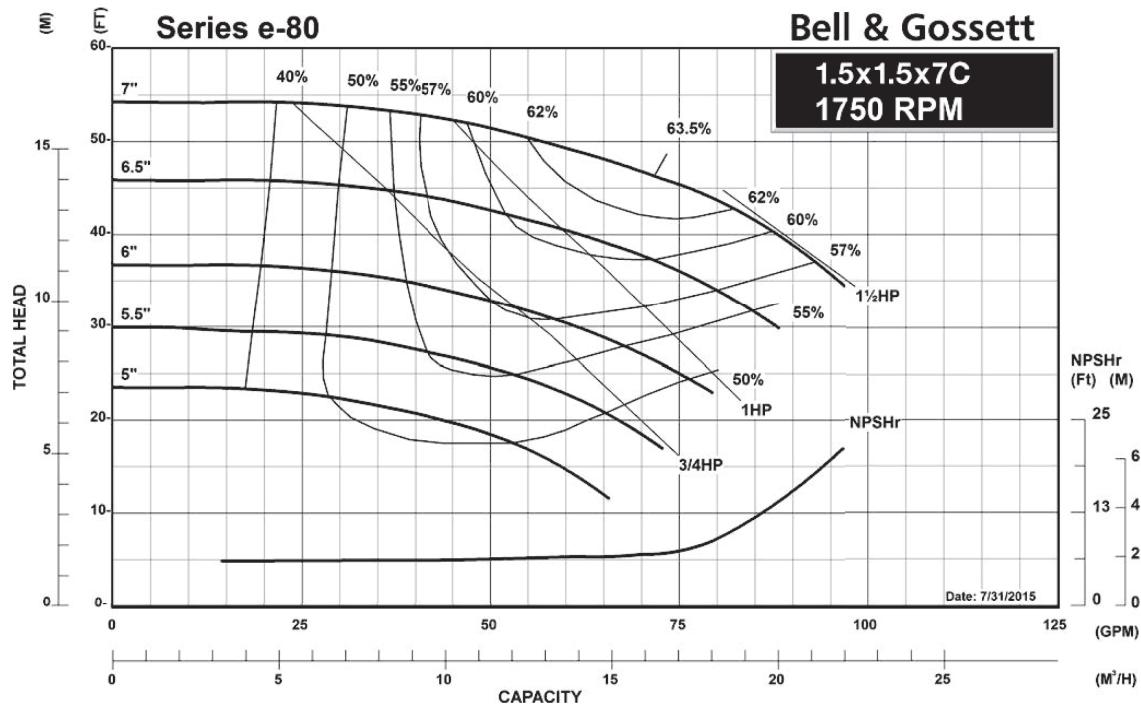
Where Q = GPM, H = Head, P = BHP, D = Impeller Dia., RPM = Pump Speed

Series e-80 Selection Charts



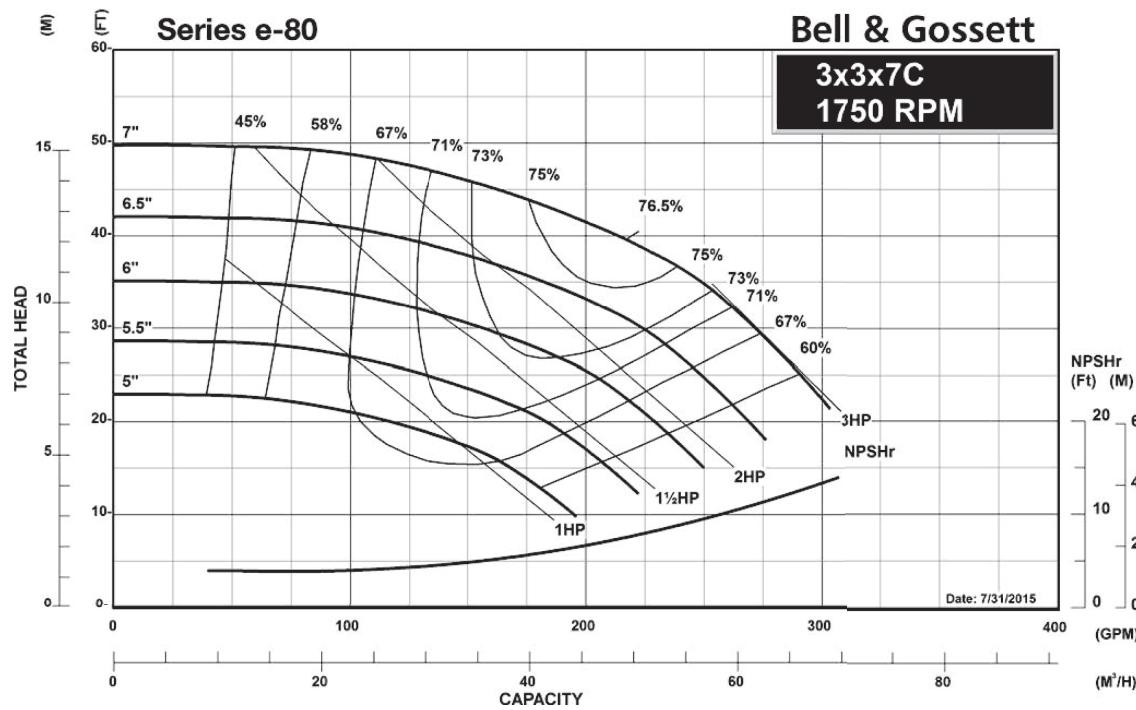
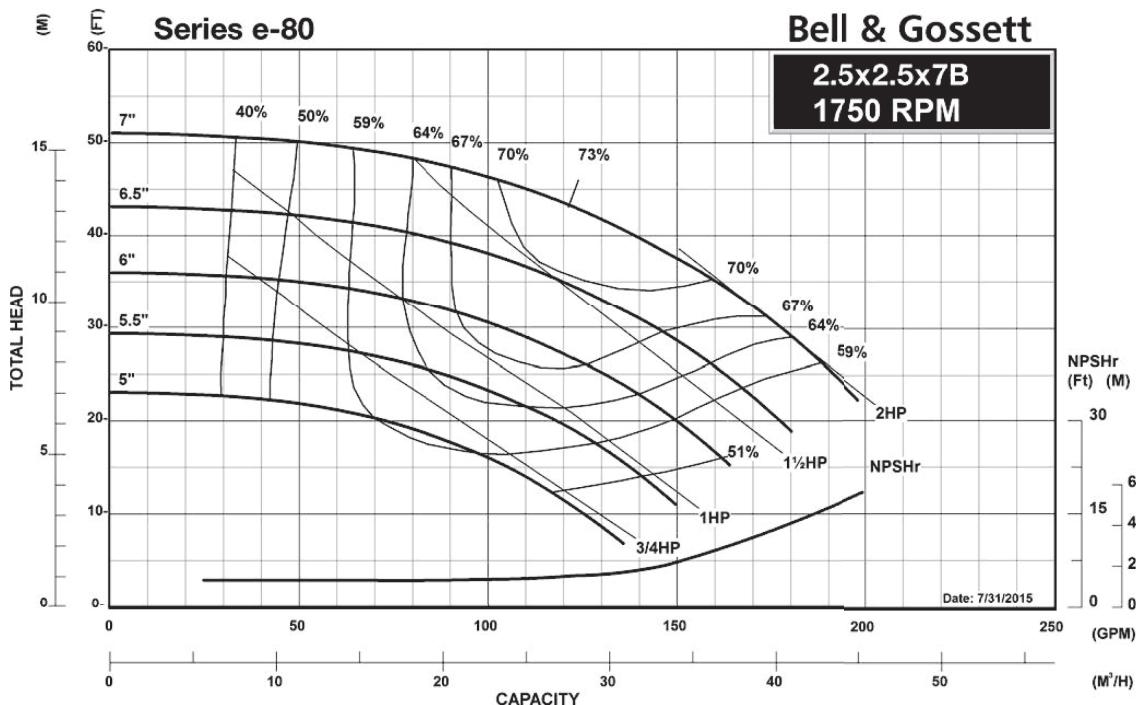
Series e-80

1800 RPM PUMP CURVES



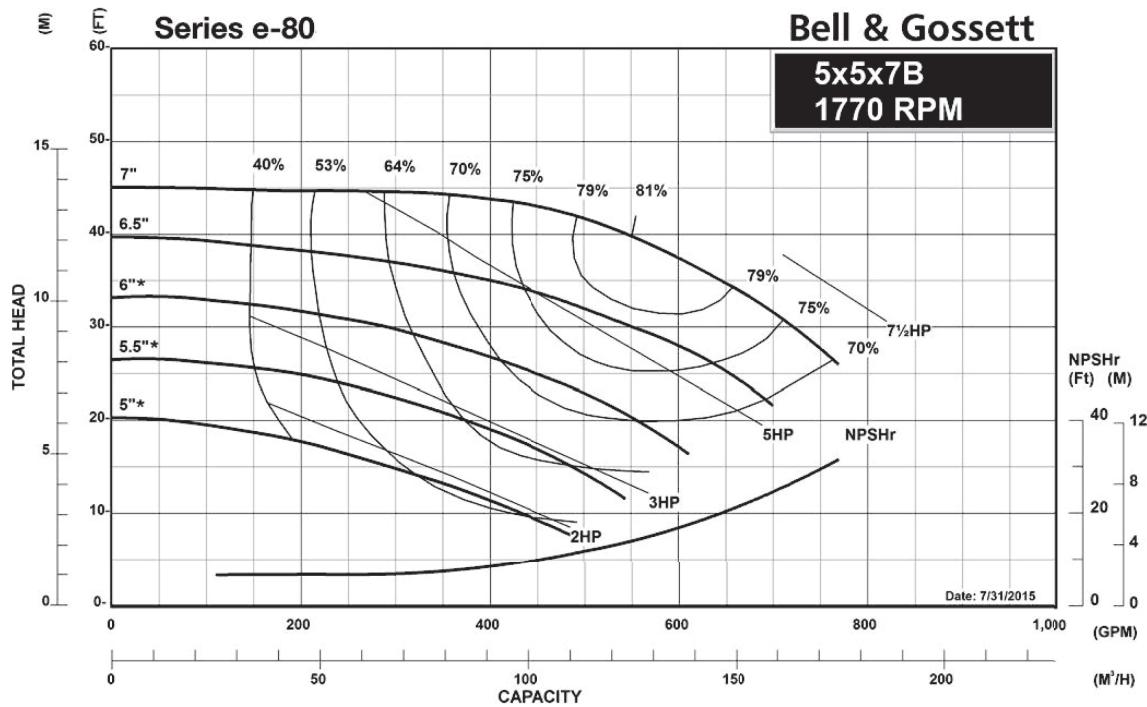
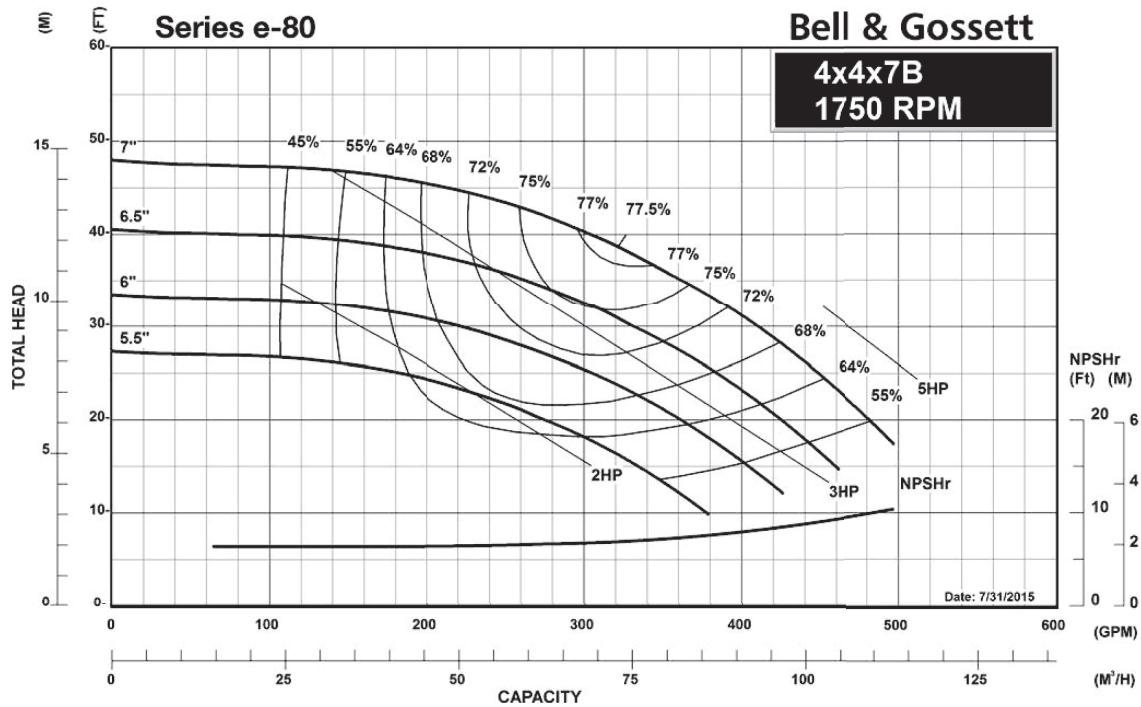
Series e-80

1800 RPM PUMP CURVES



Series e-80

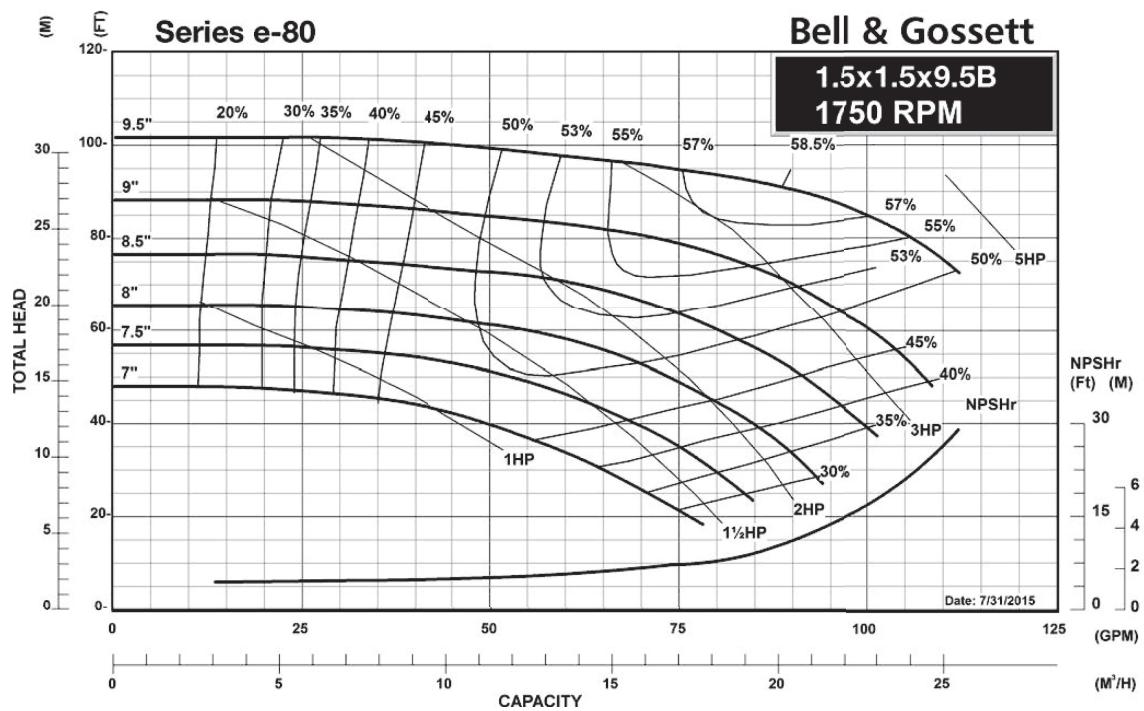
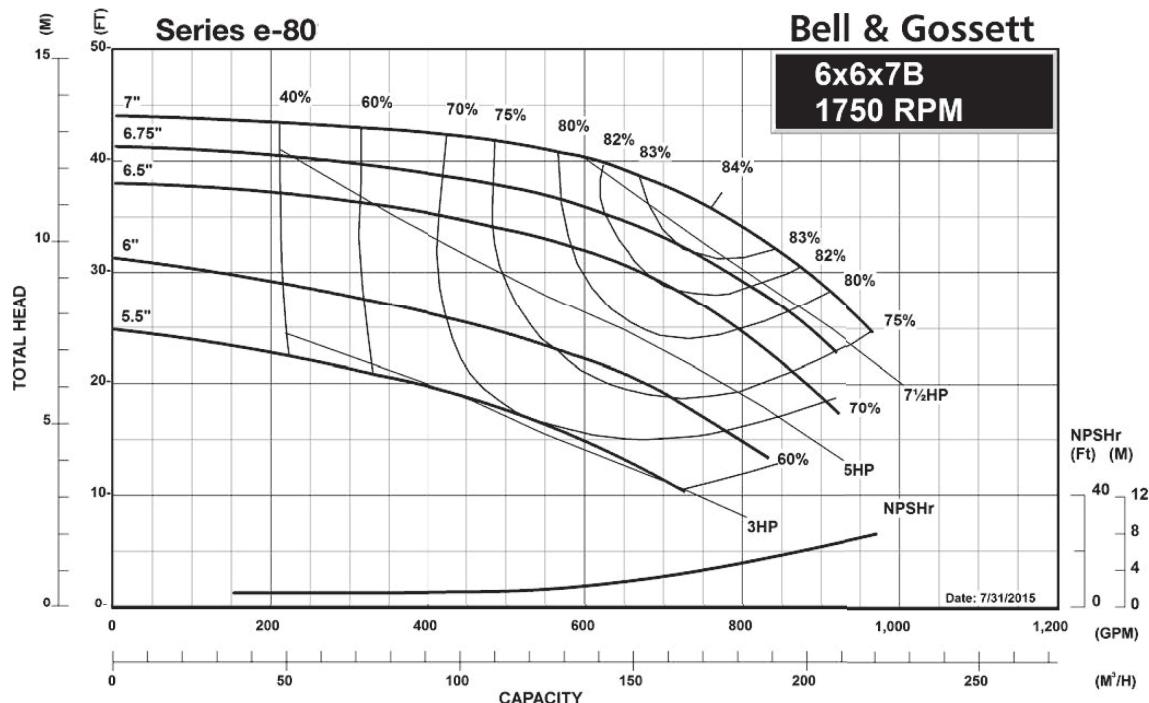
1800 RPM PUMP CURVES



*6" and below requires oversized diameter and angle trim. See manual.

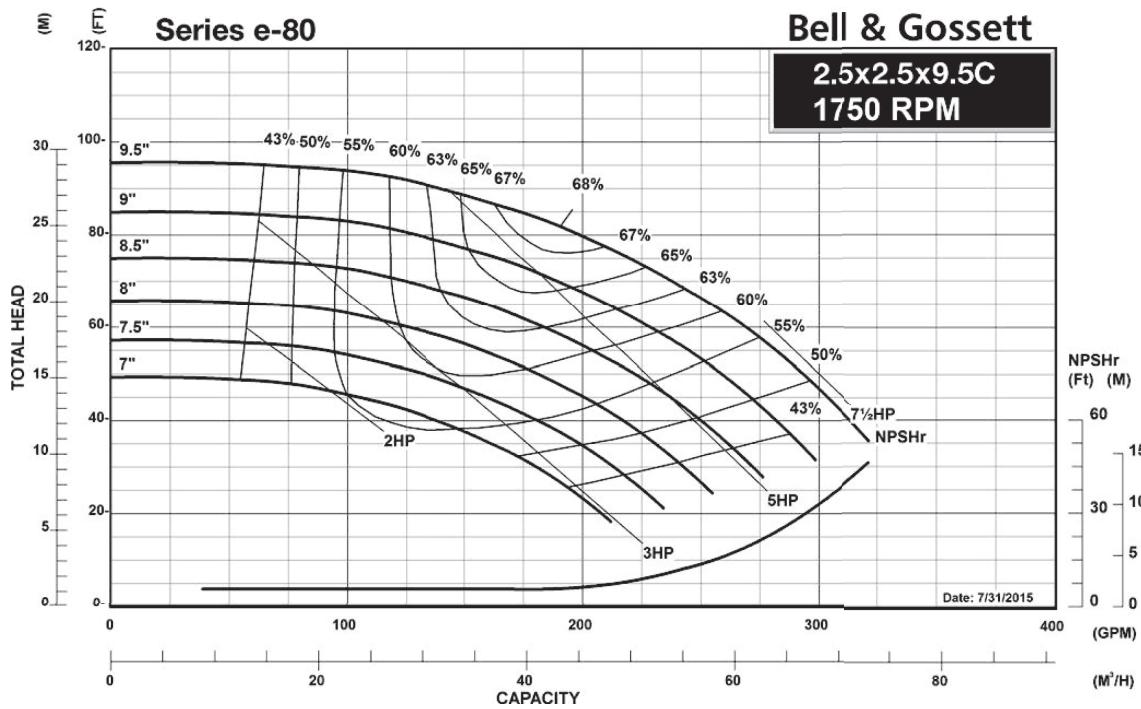
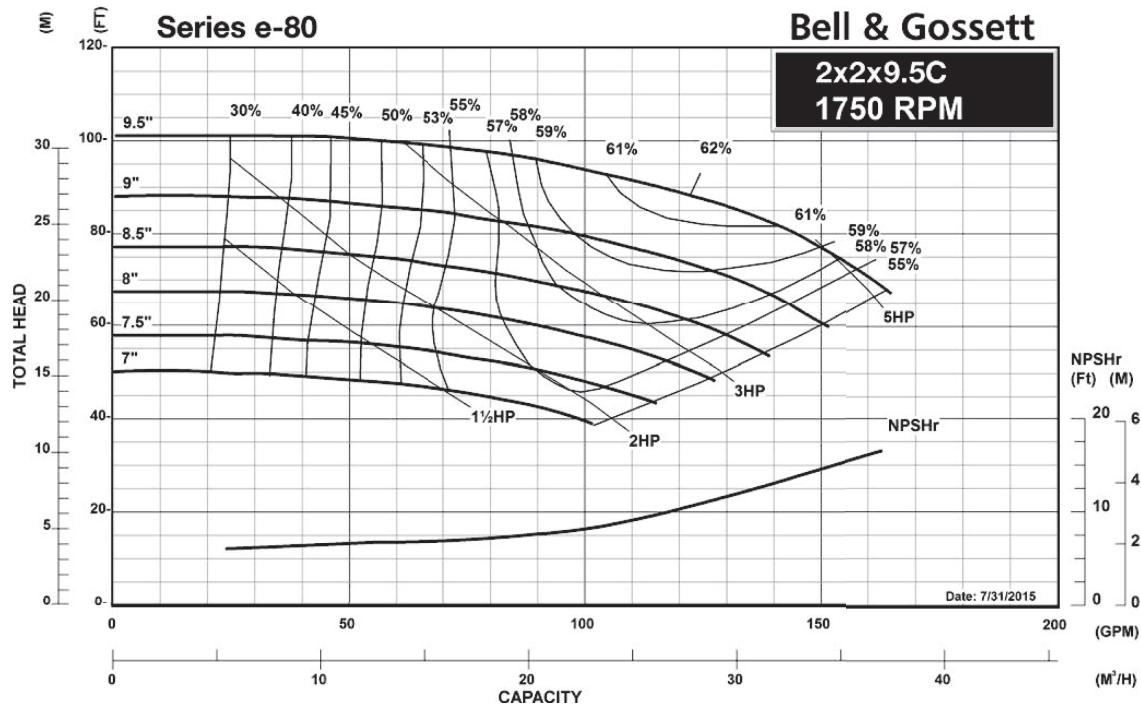
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1800 RPM PUMP CURVES



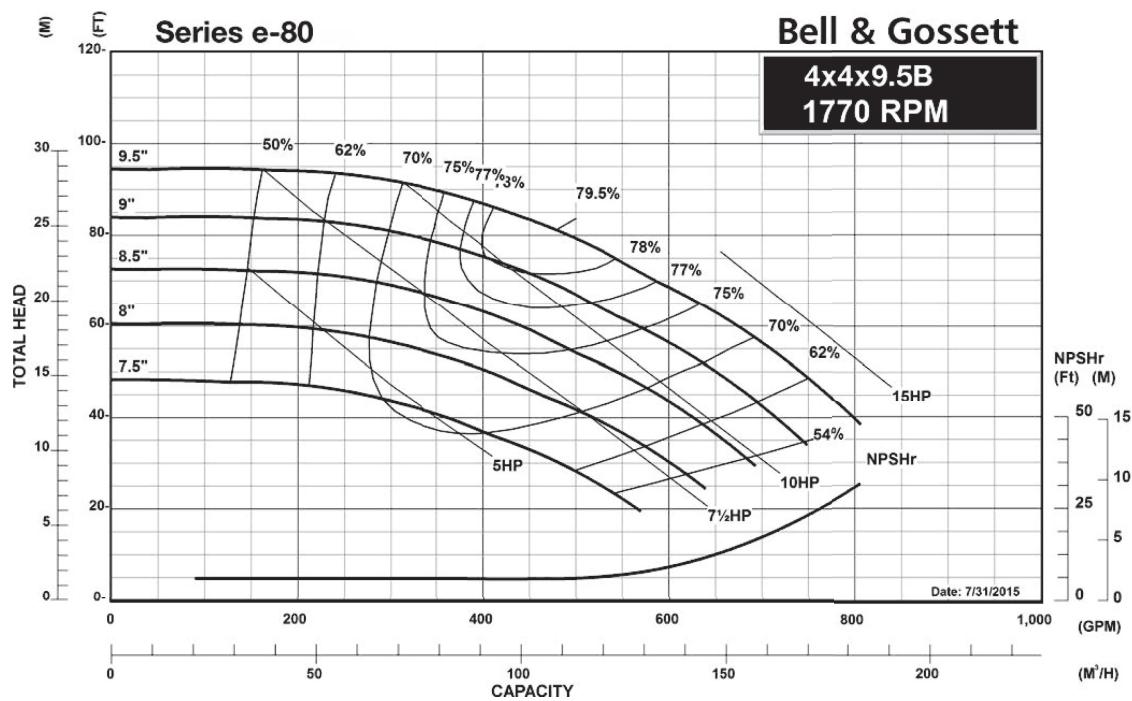
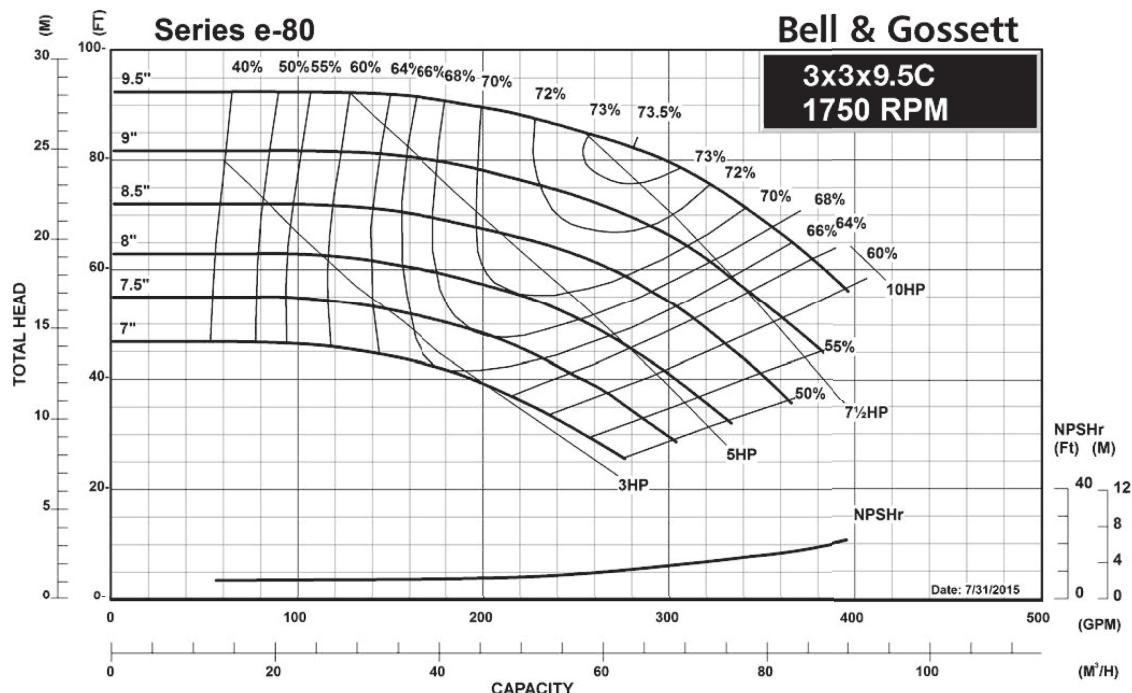
Series e-80

1800 RPM PUMP CURVES



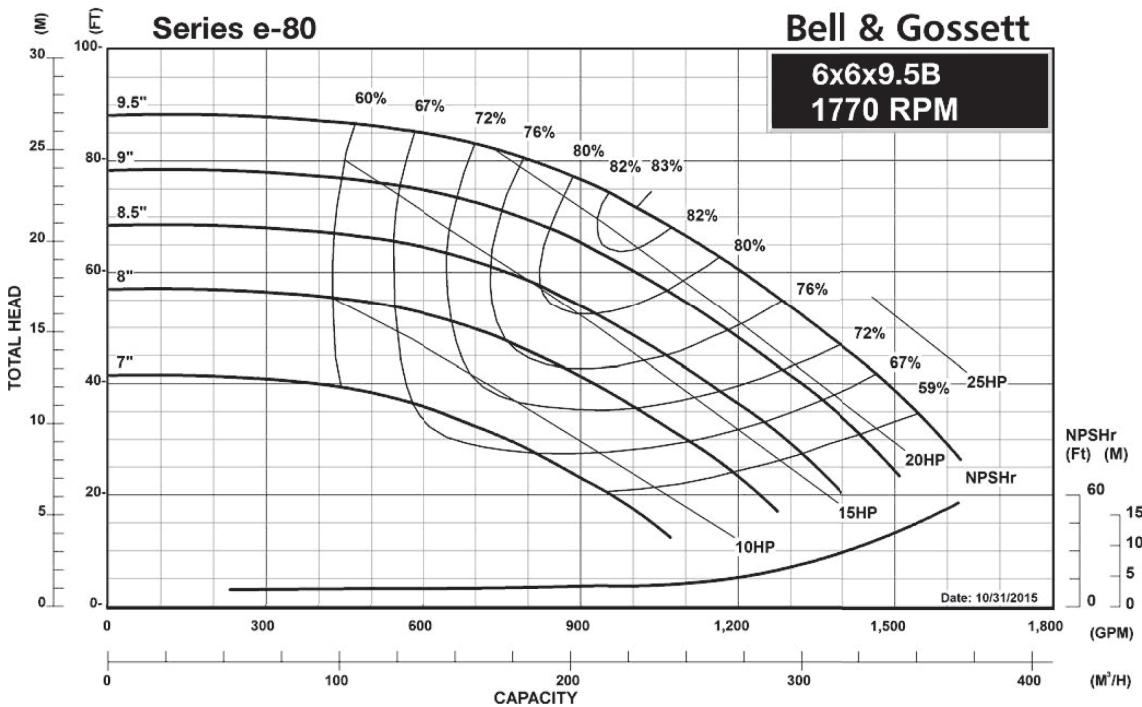
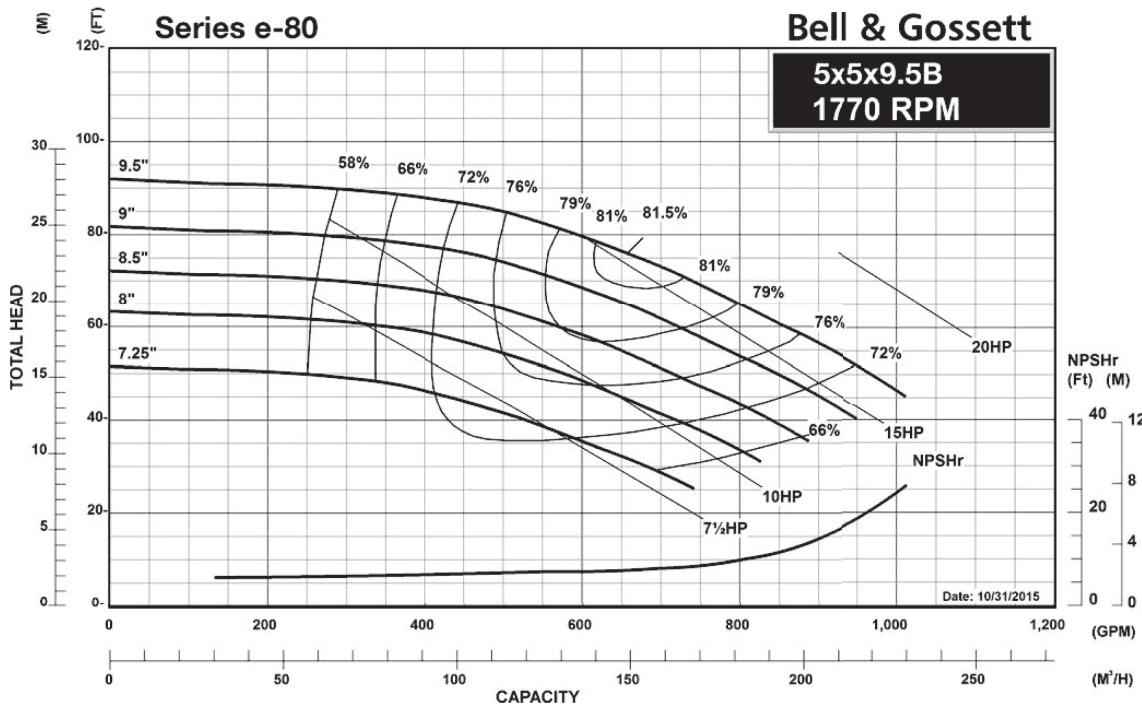
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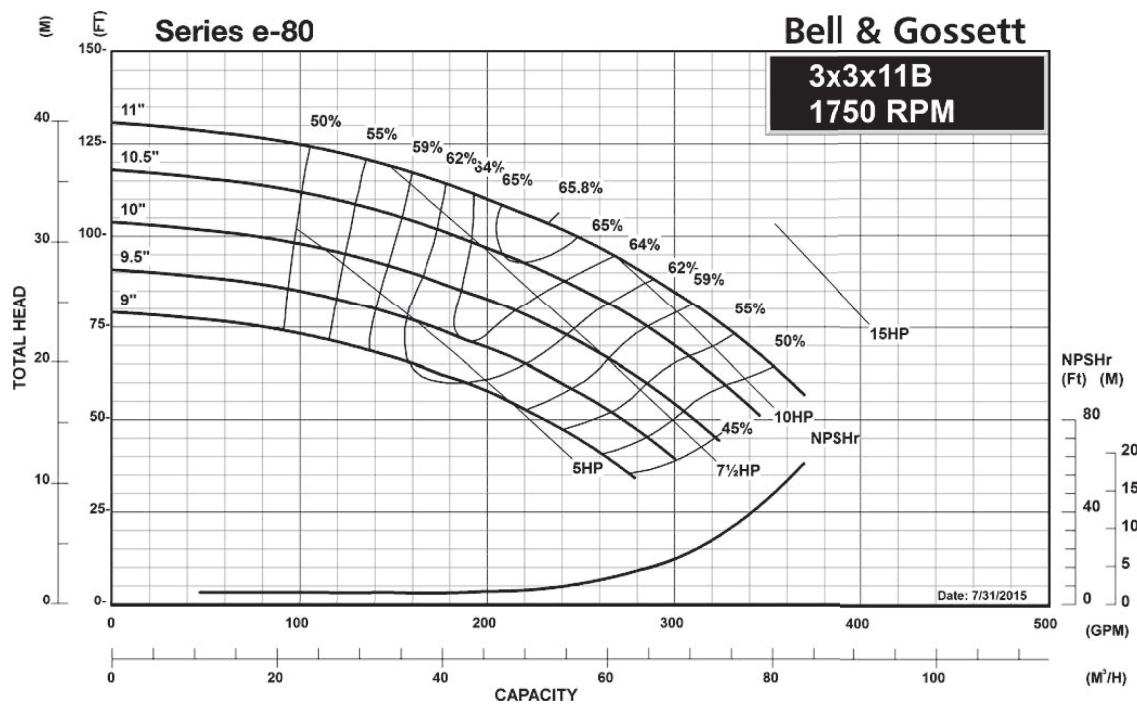
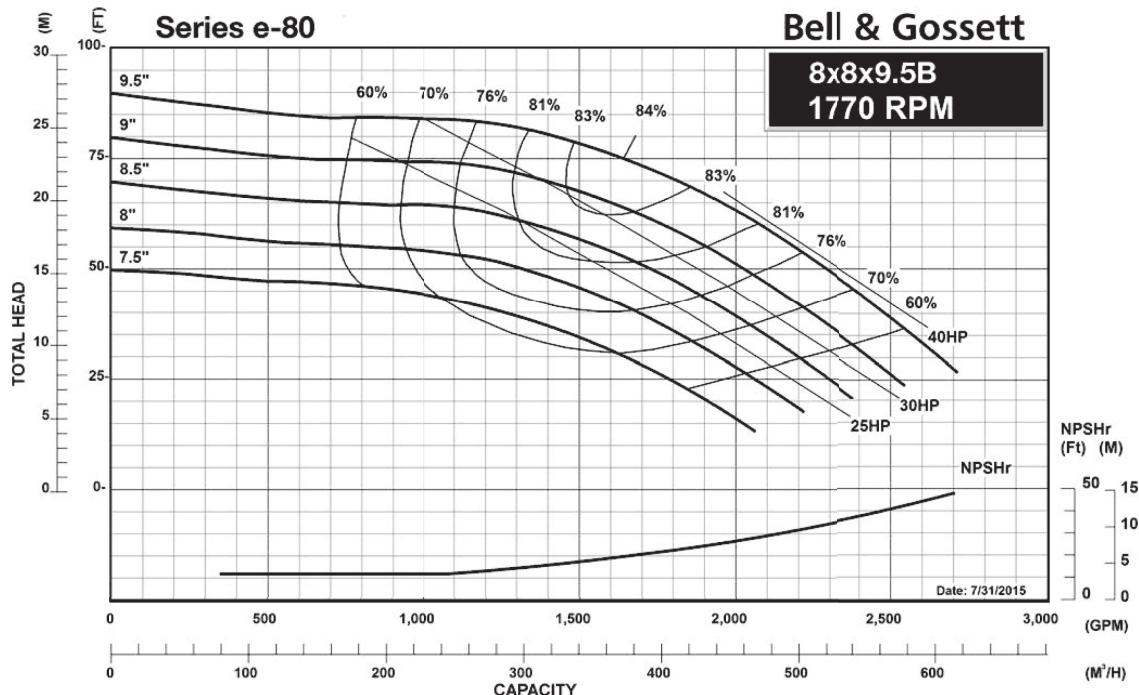
Series e-80

1800 RPM PUMP CURVES



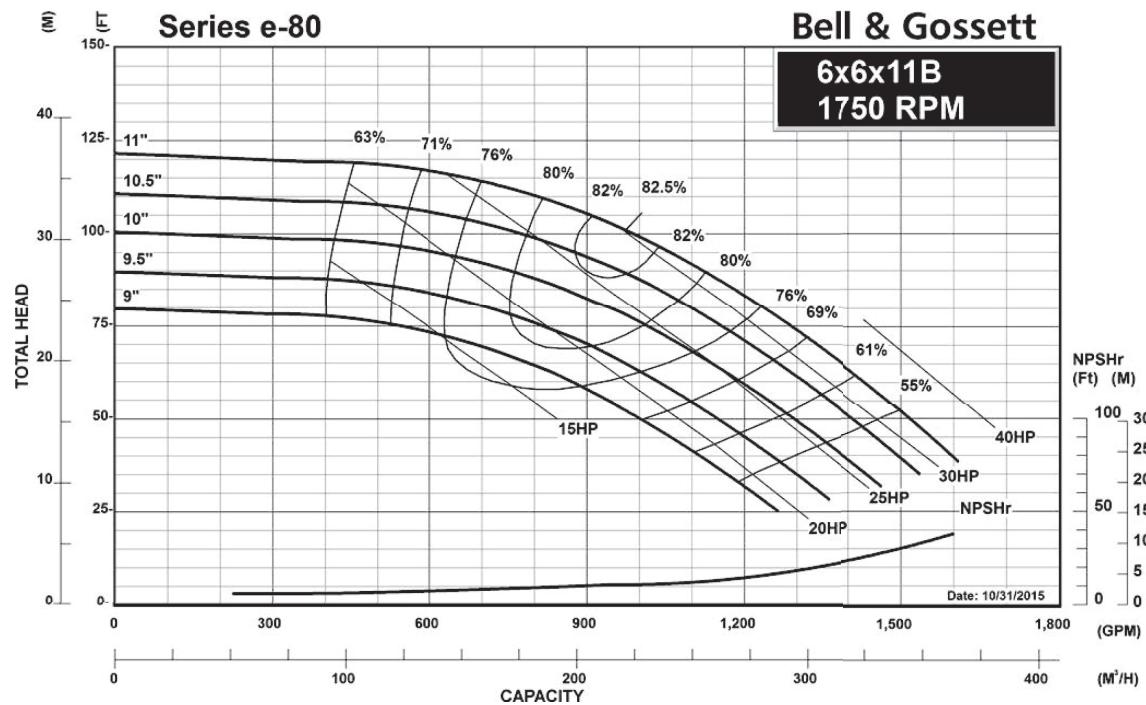
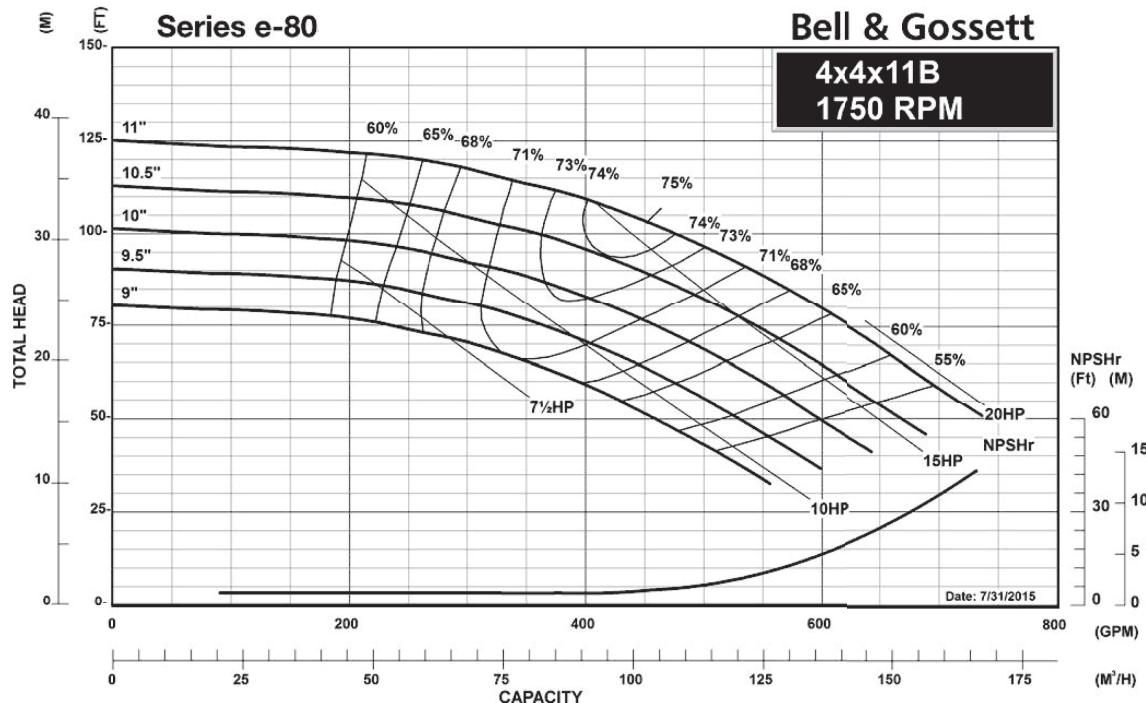
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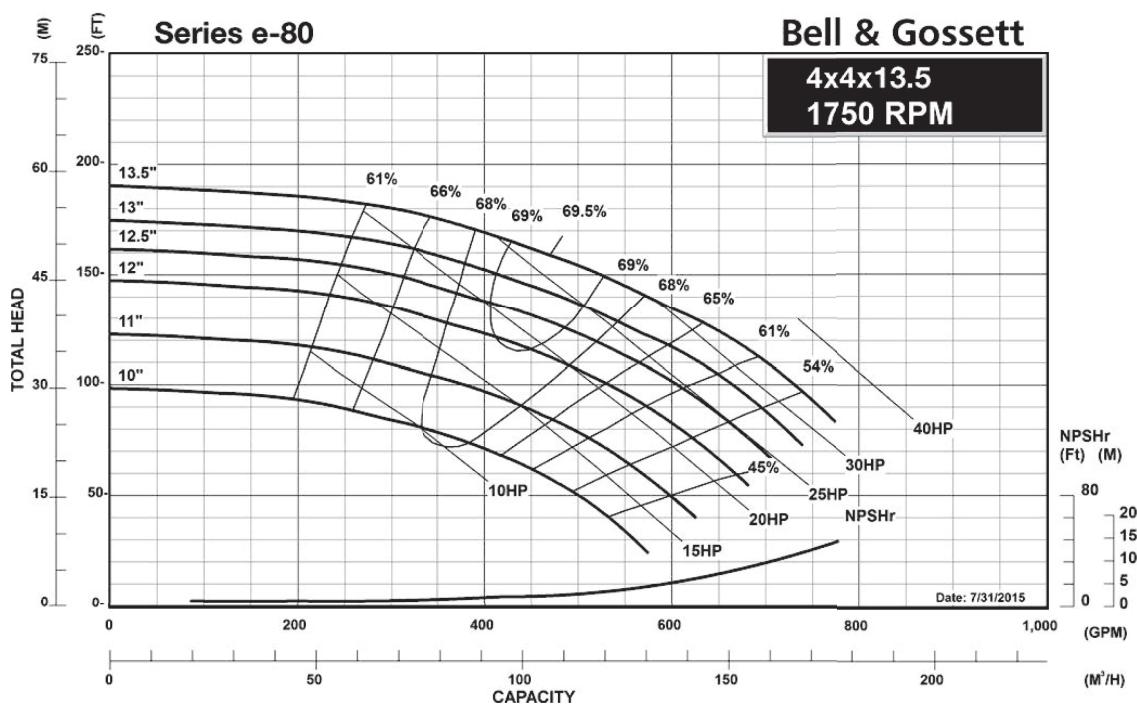
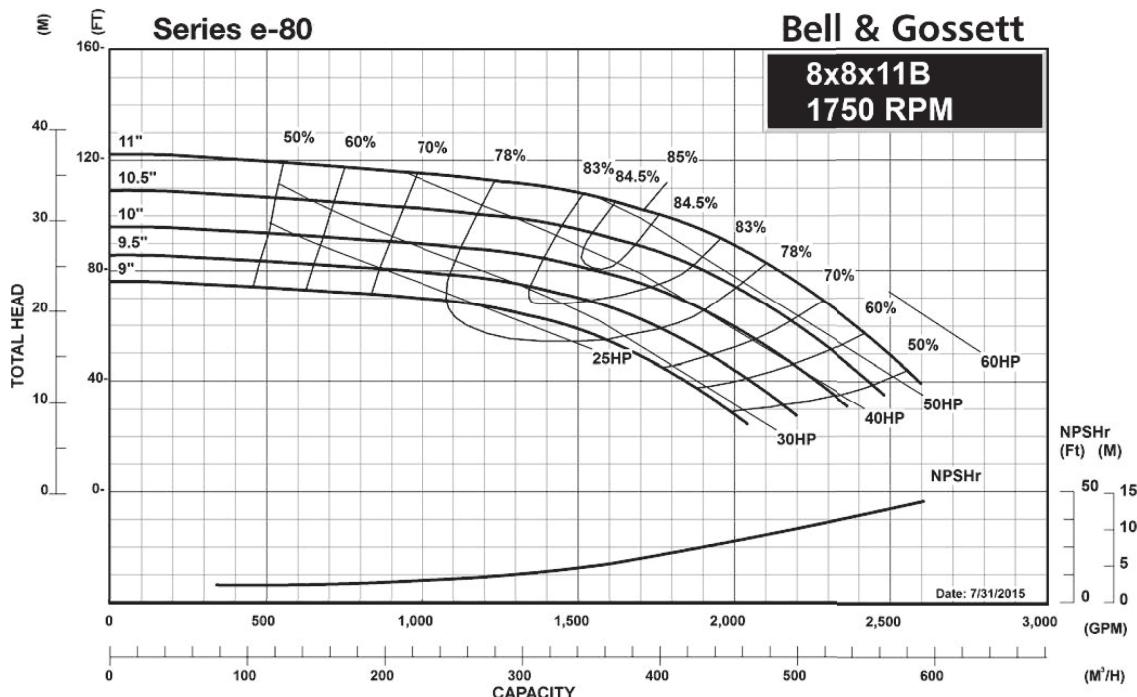
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1800 RPM PUMP CURVES



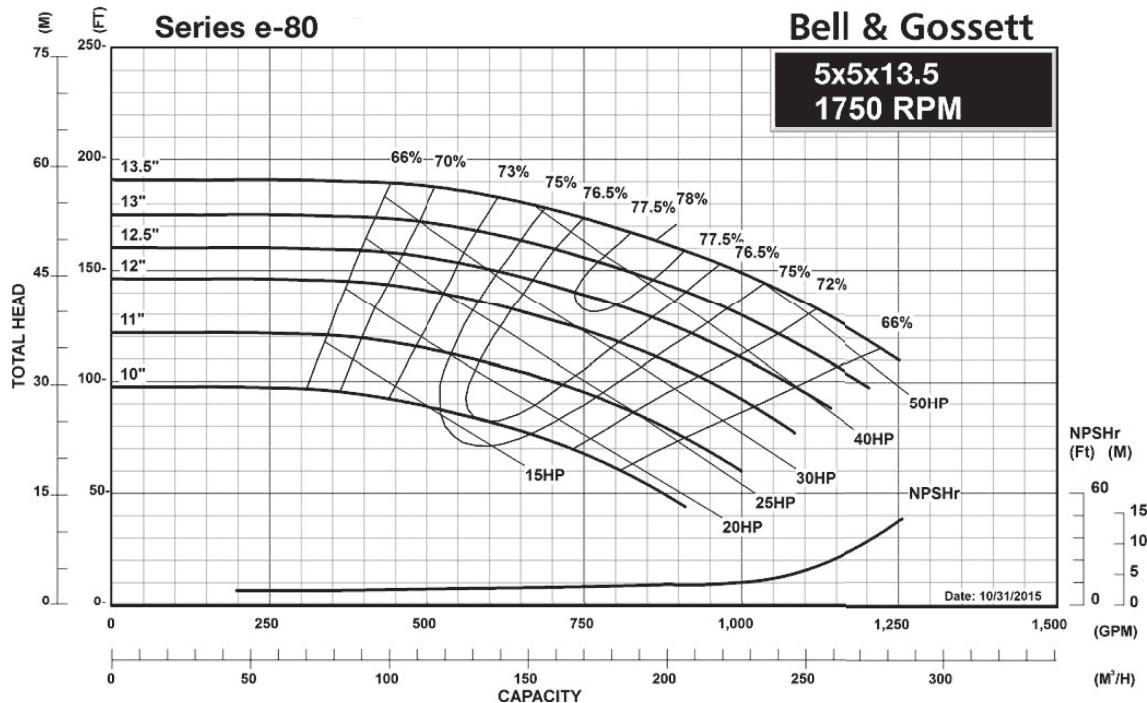
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1800 RPM PUMP CURVES



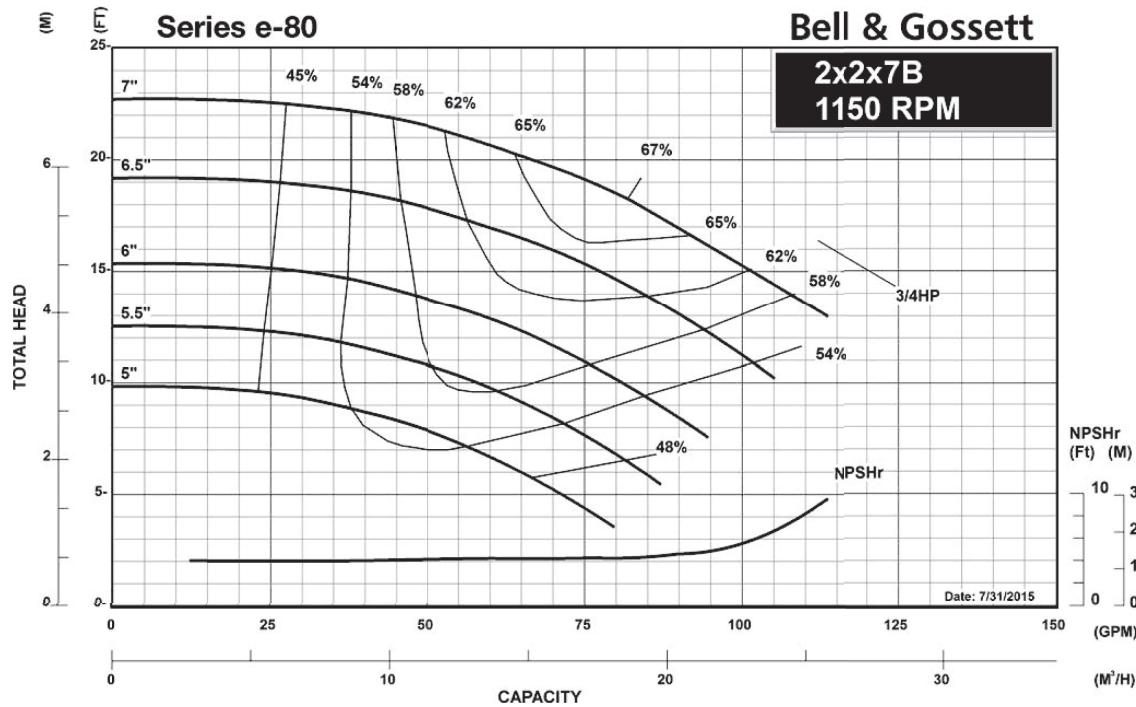
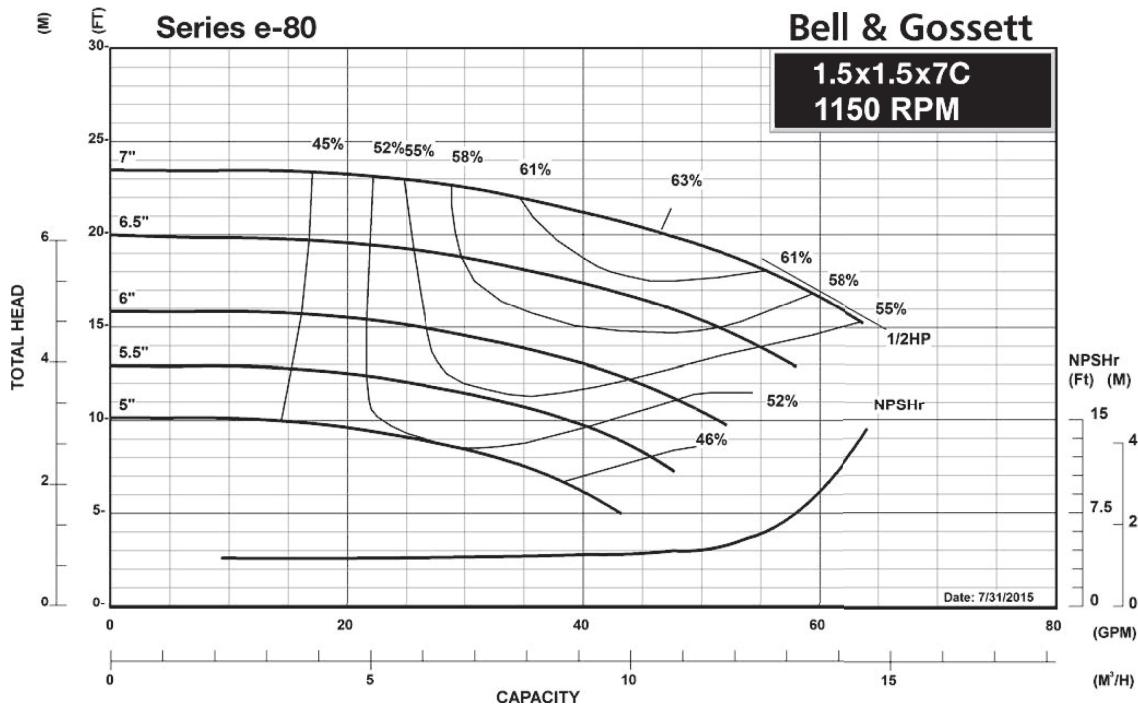
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1800 RPM PUMP CURVES



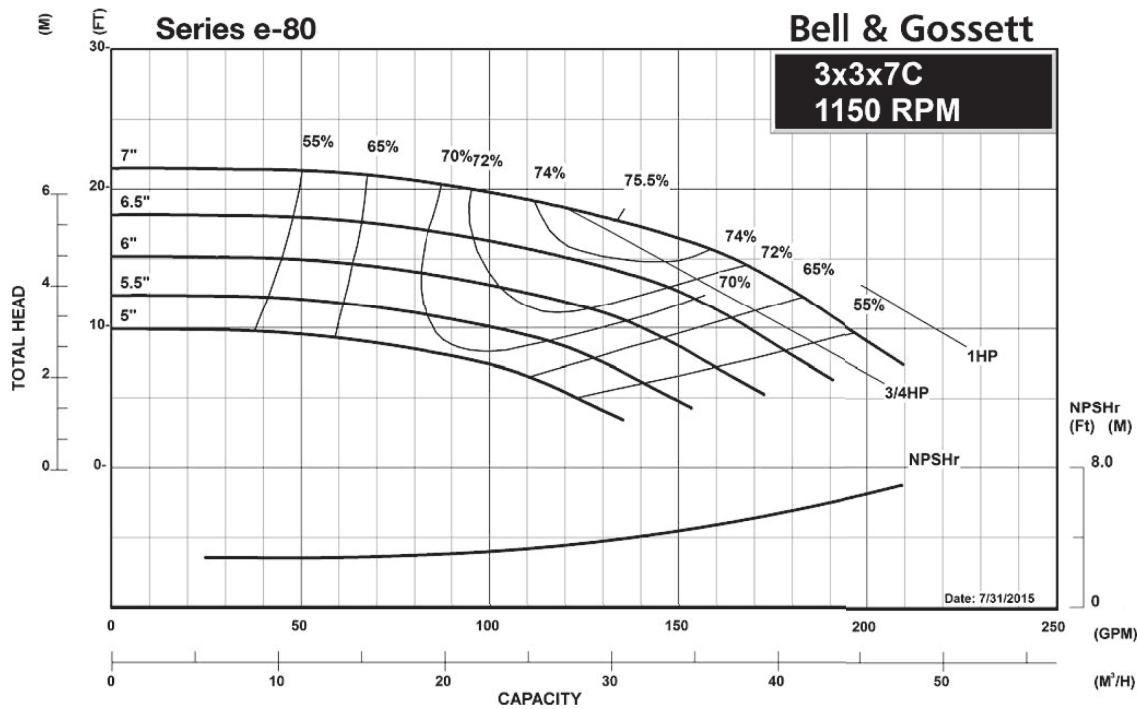
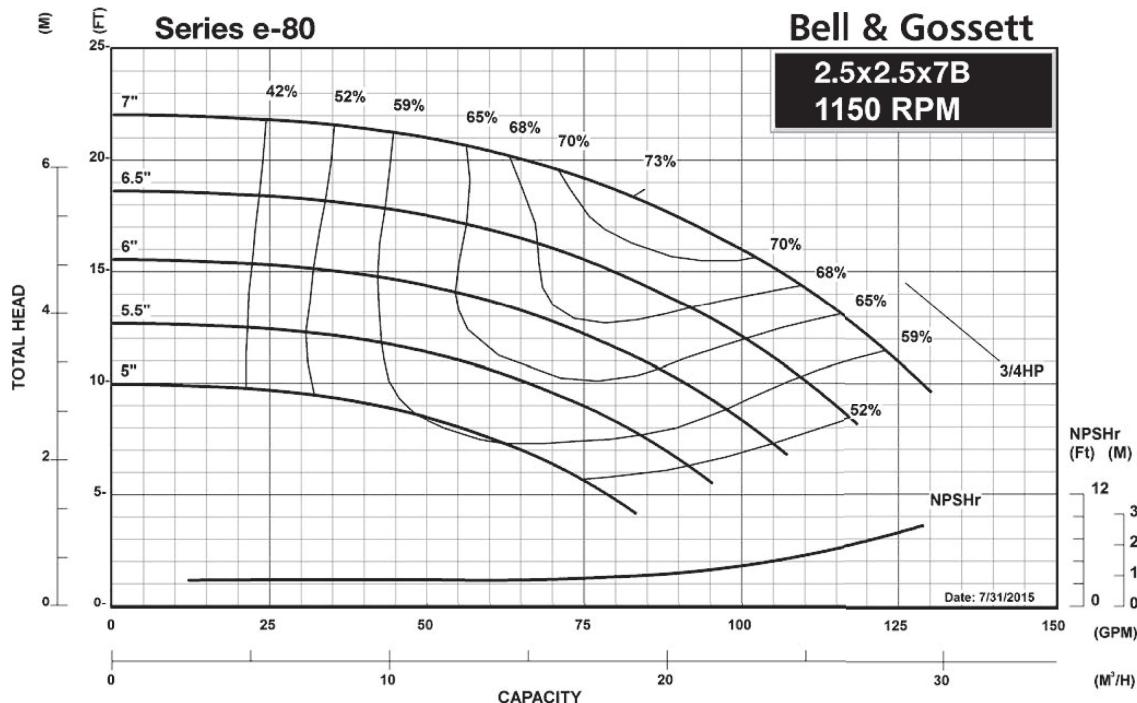
Series e-80

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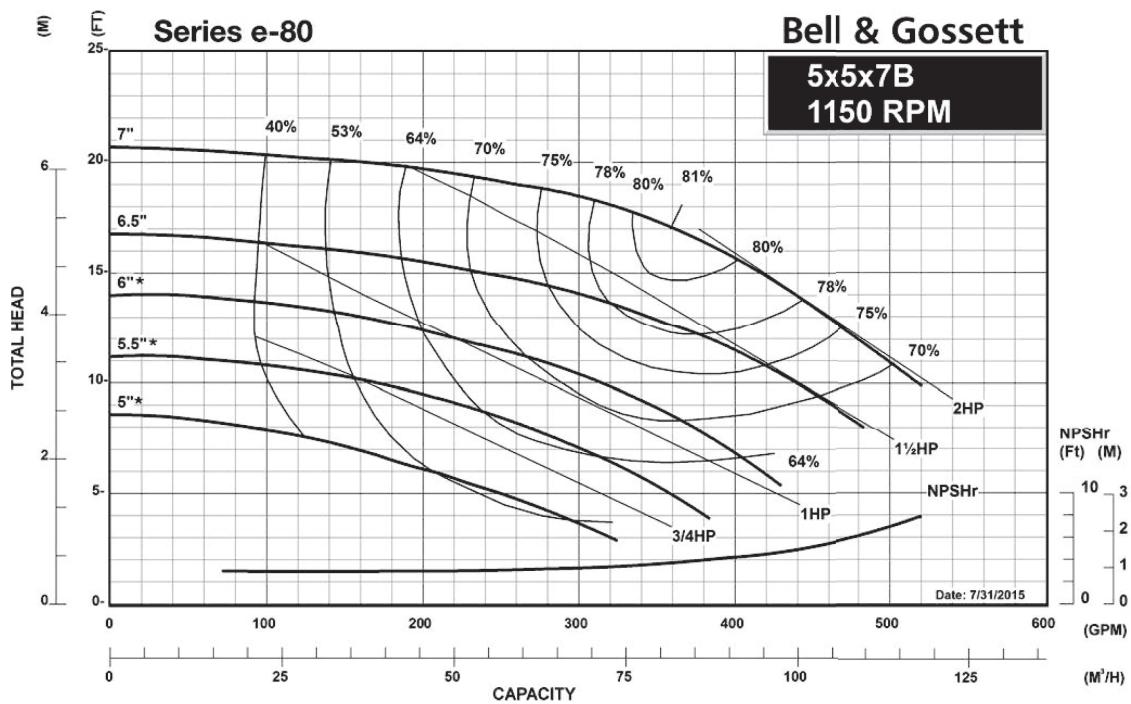
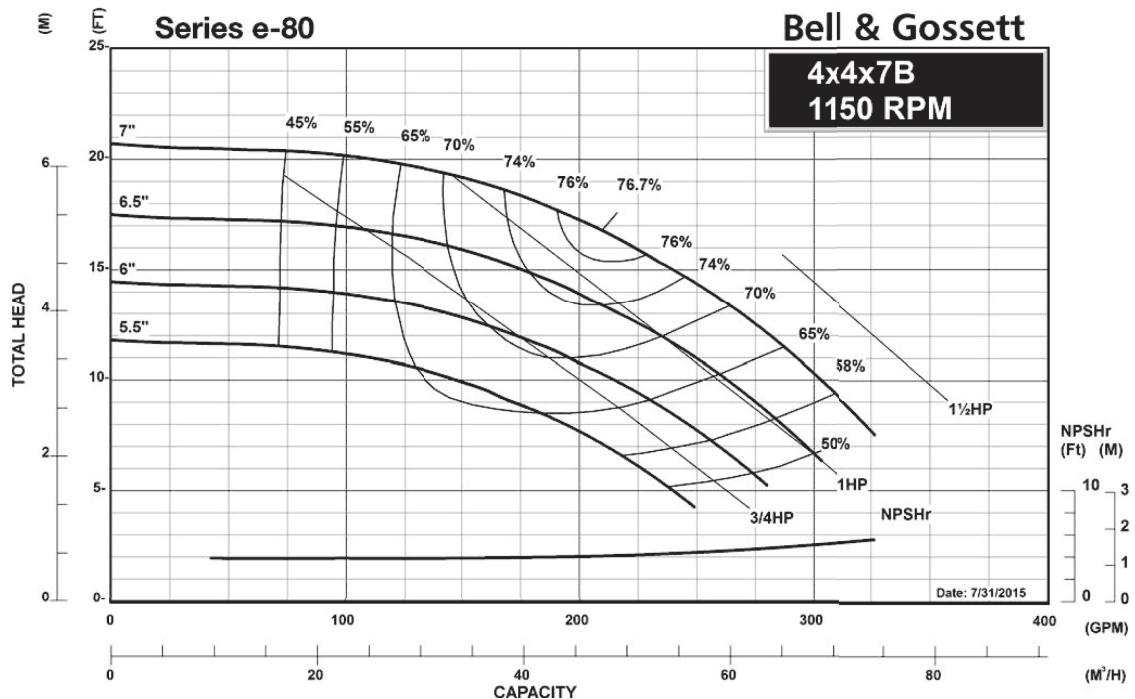
Series e-80

1200 RPM PUMP CURVES



Series e-80

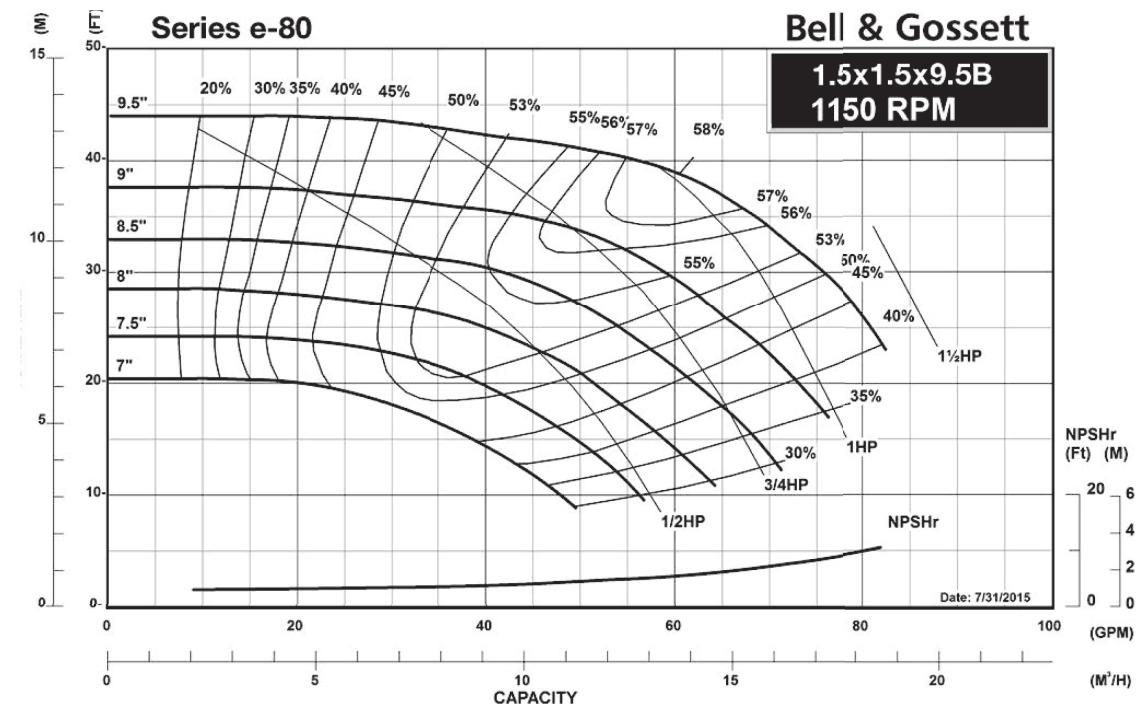
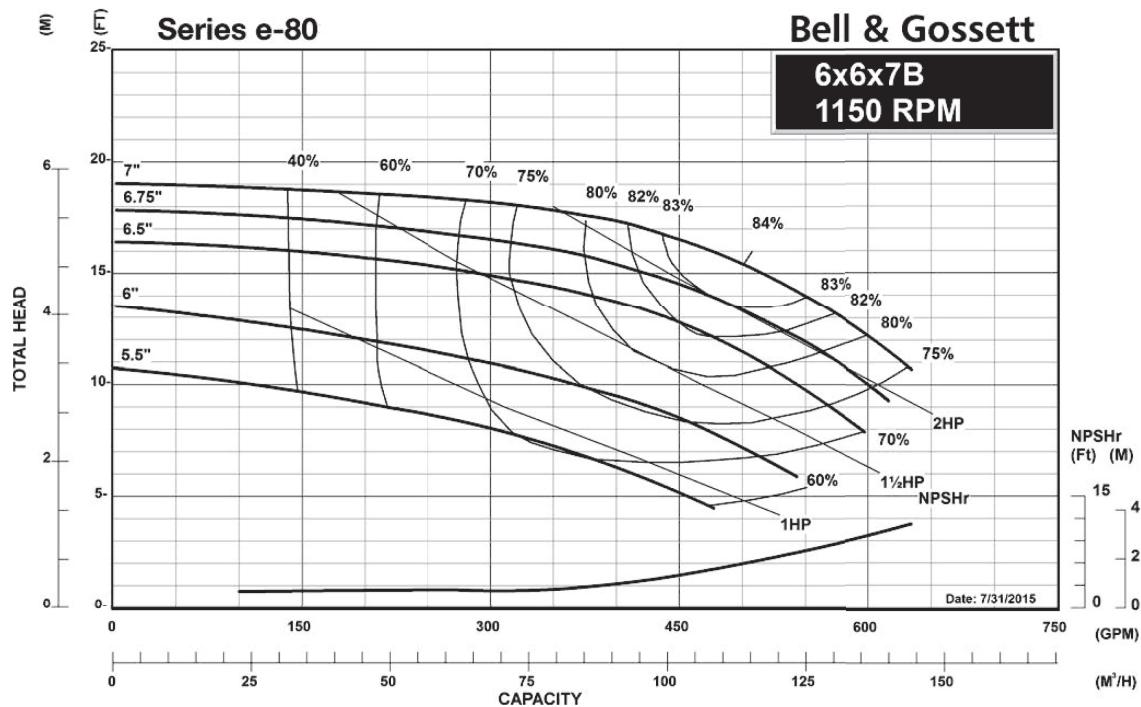
1200 RPM PUMP CURVES



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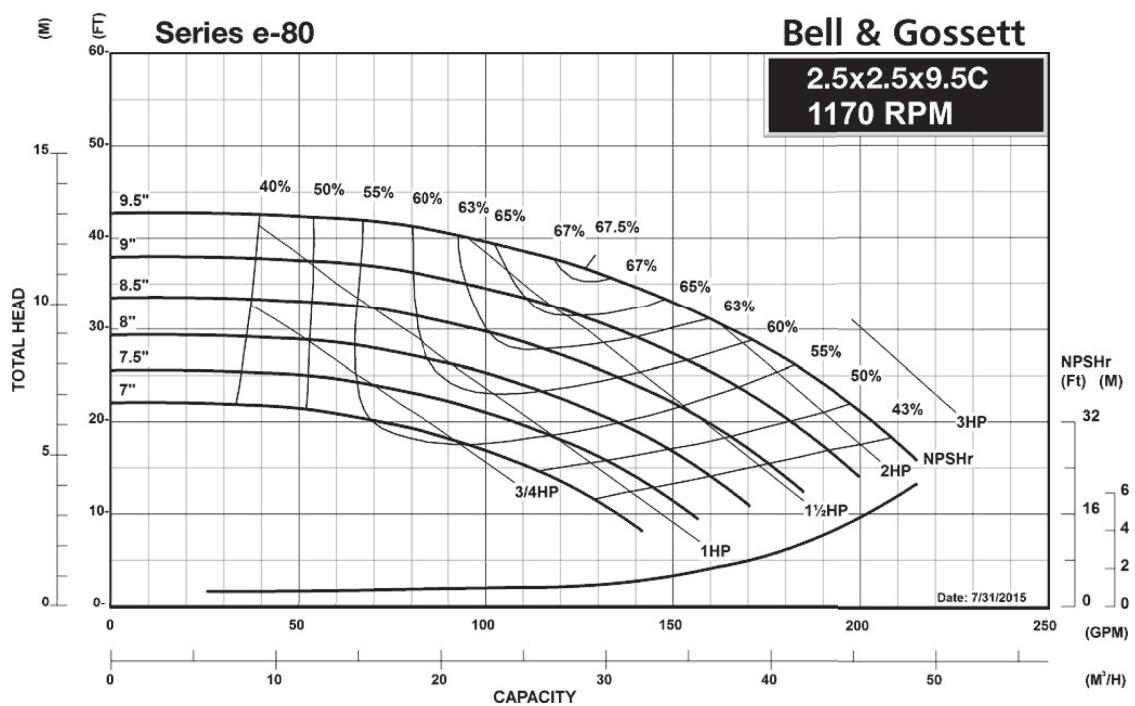
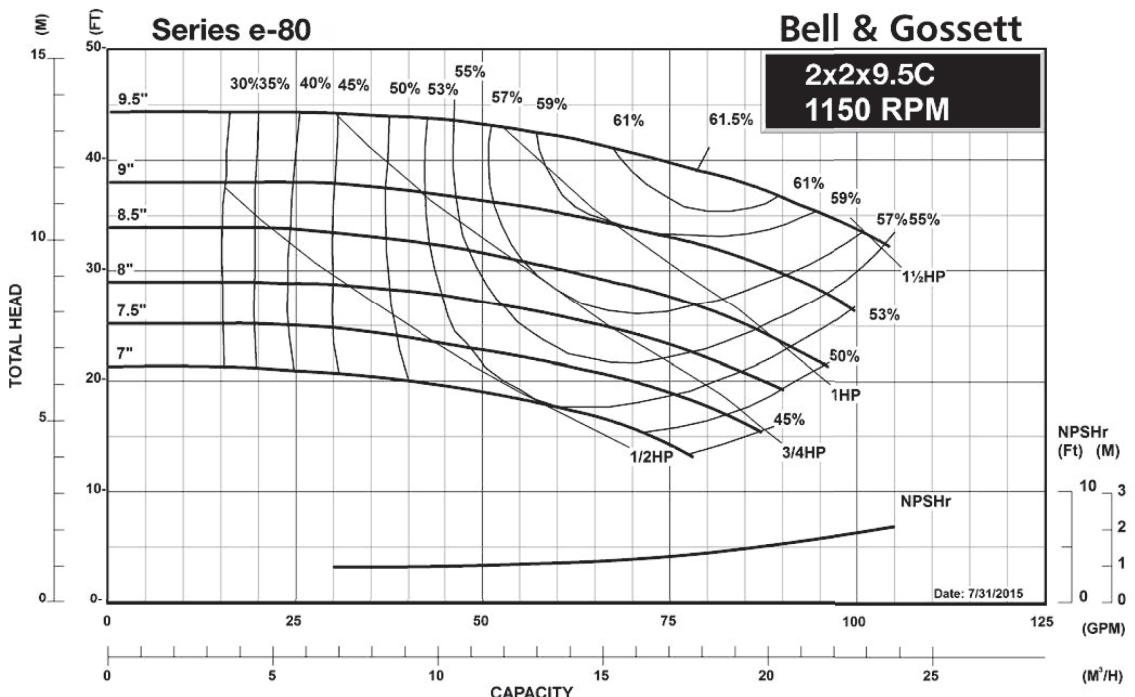
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1200 RPM PUMP CURVES



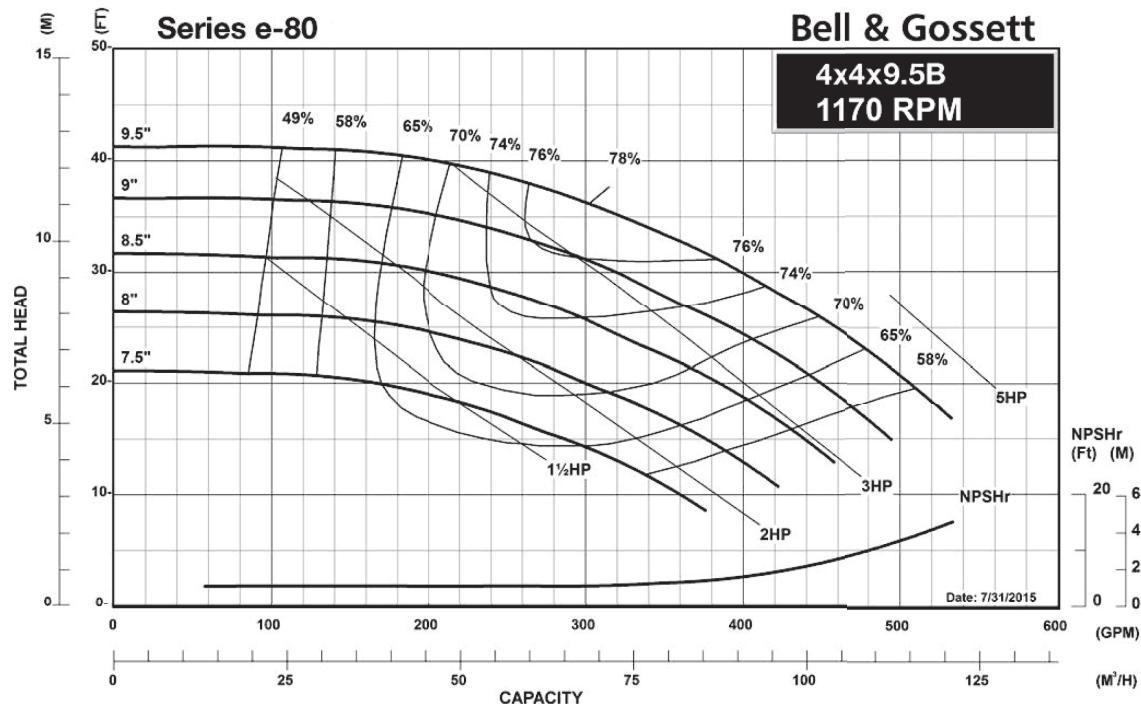
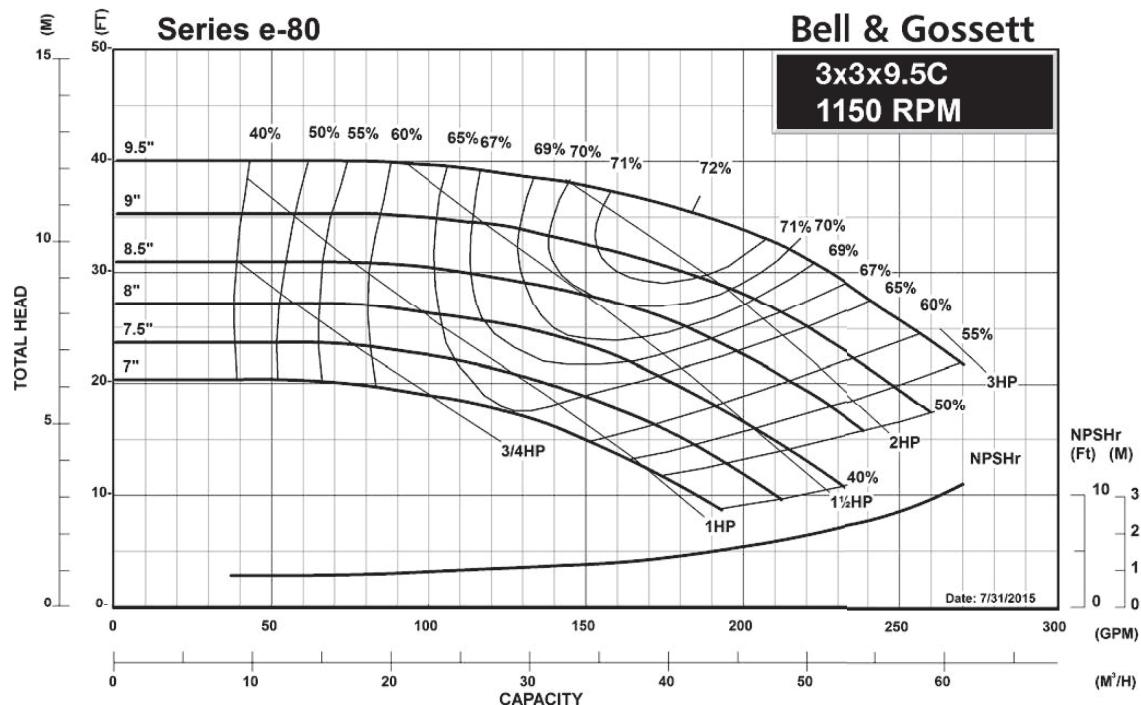
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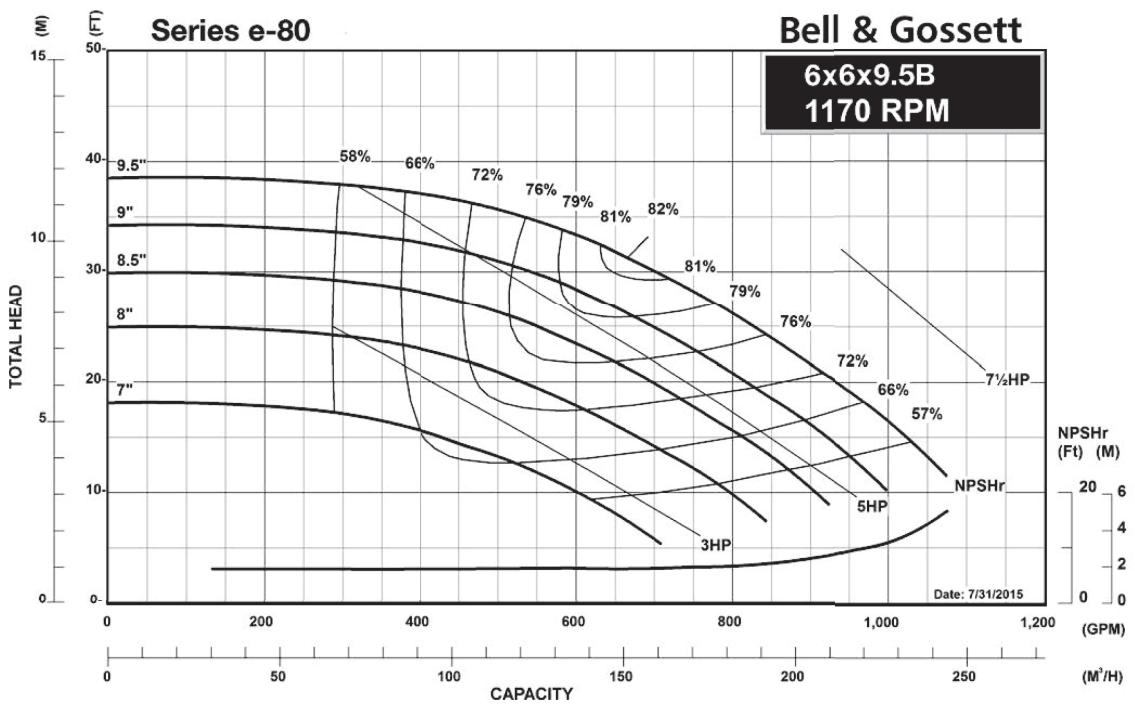
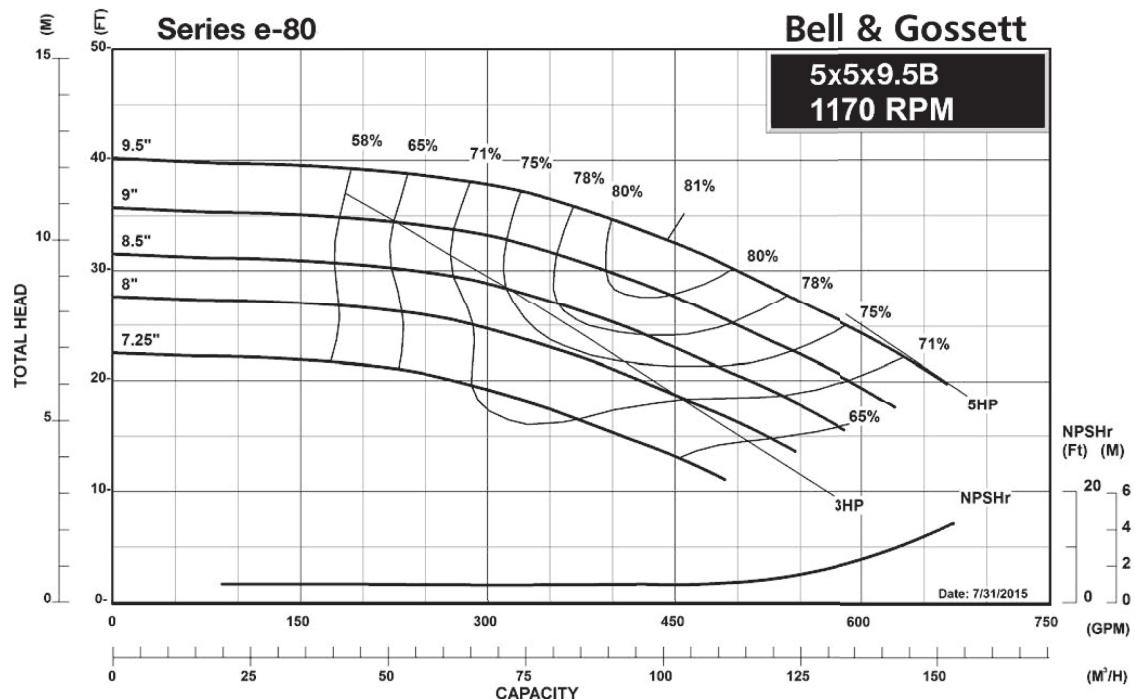
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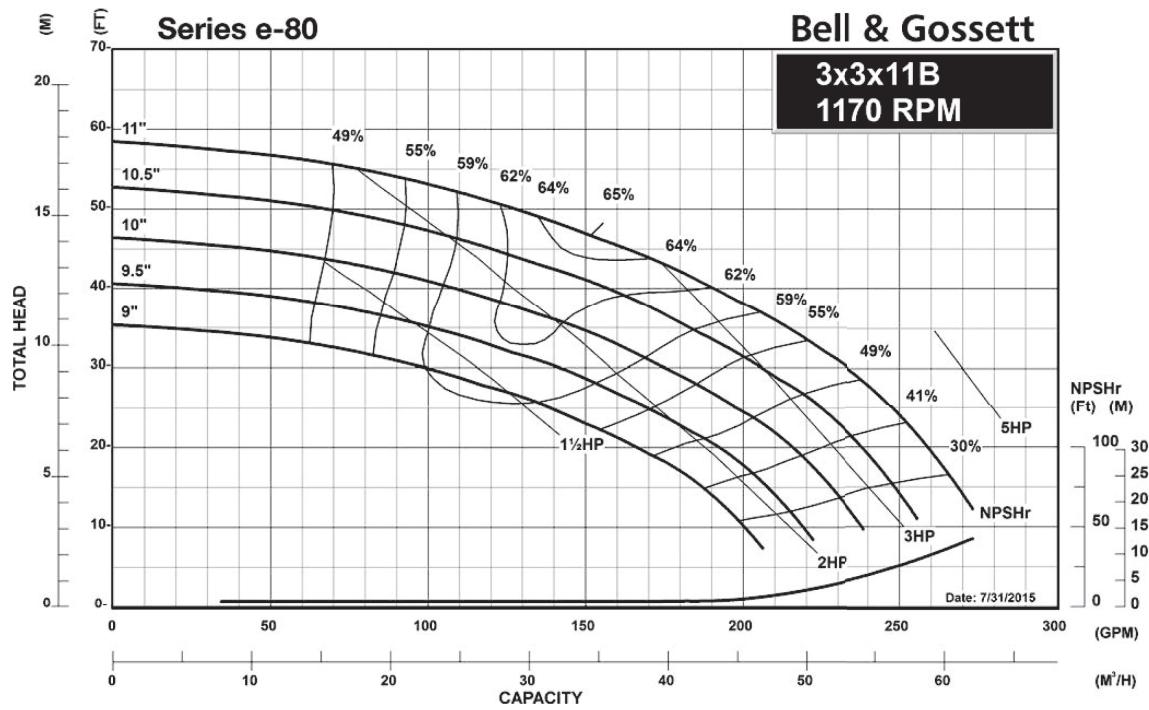
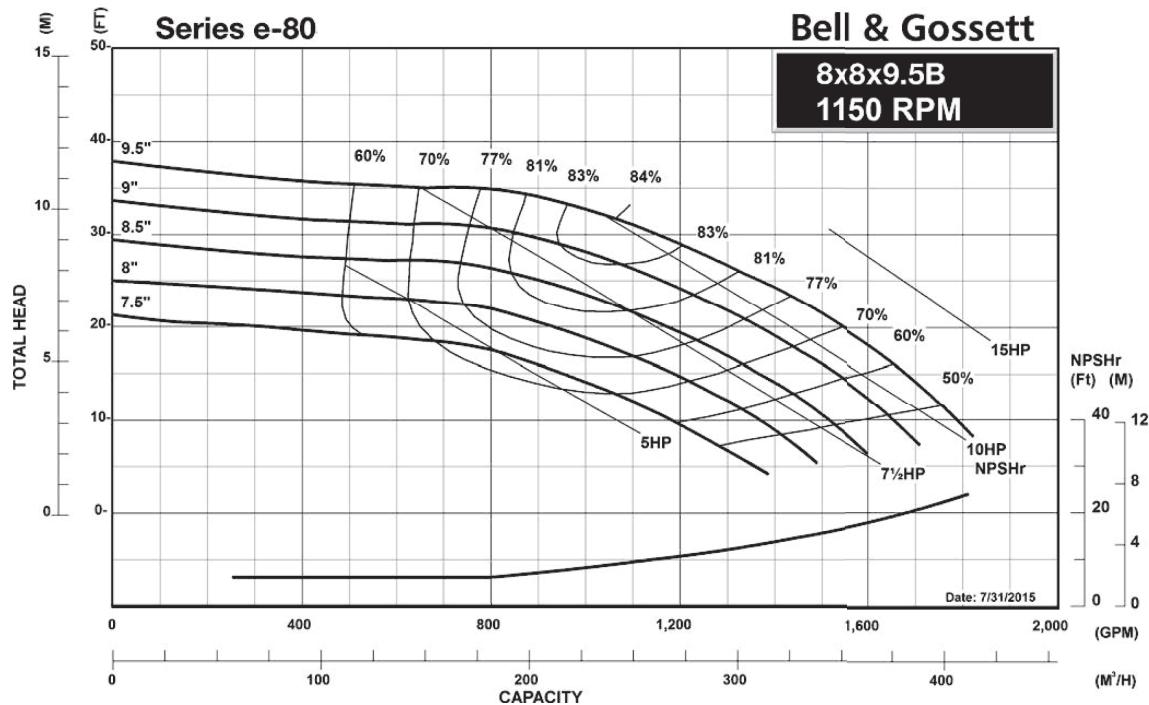
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1200 RPM PUMP CURVES



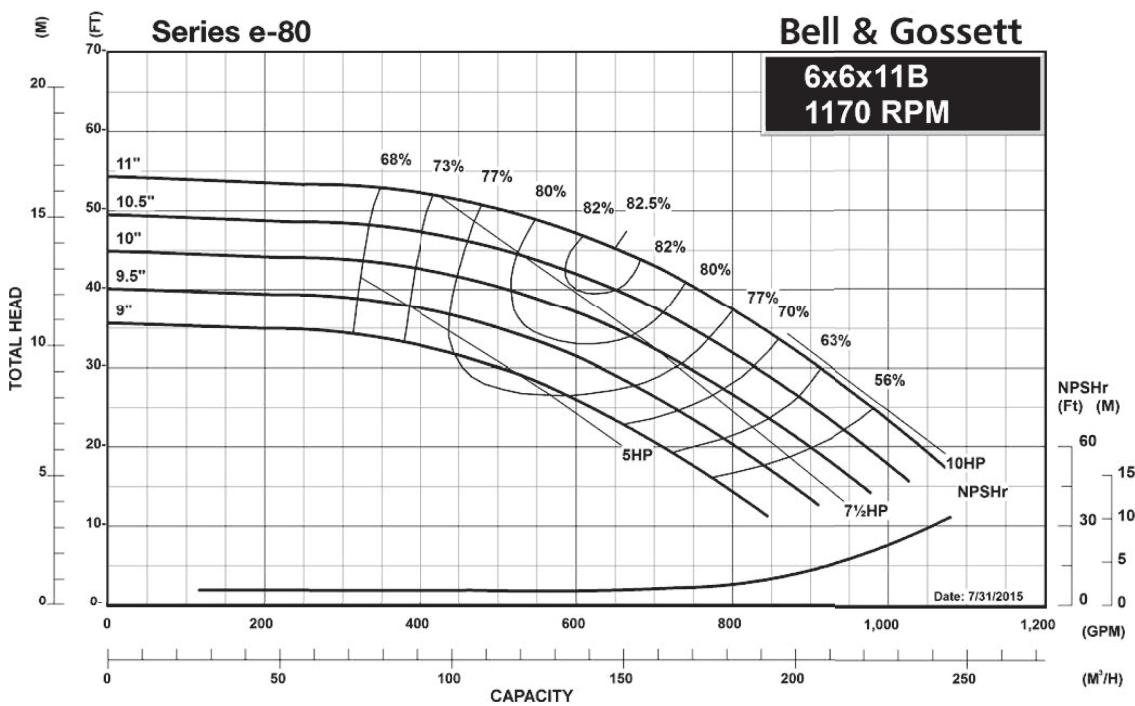
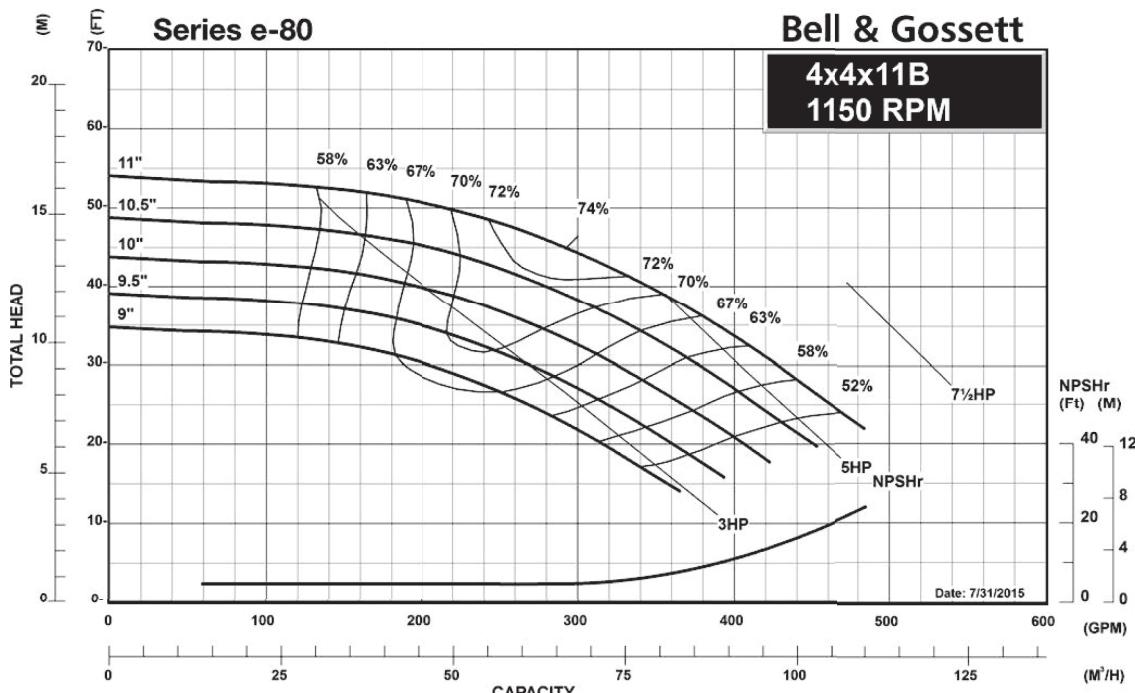
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1200 RPM PUMP CURVES



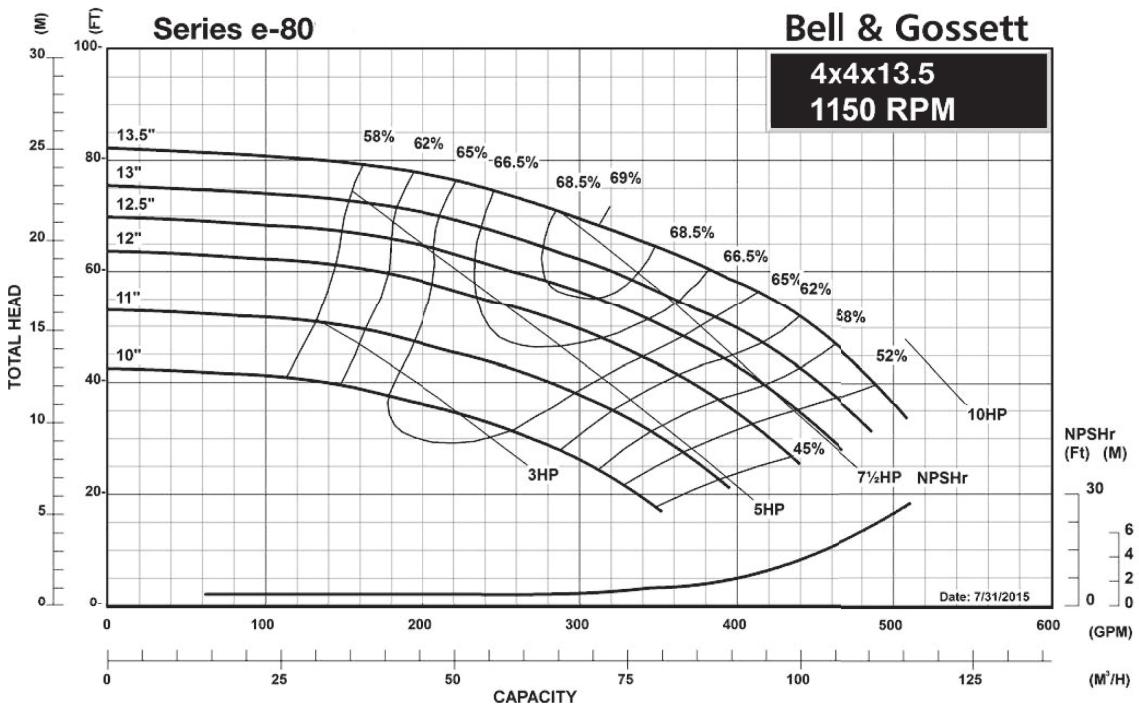
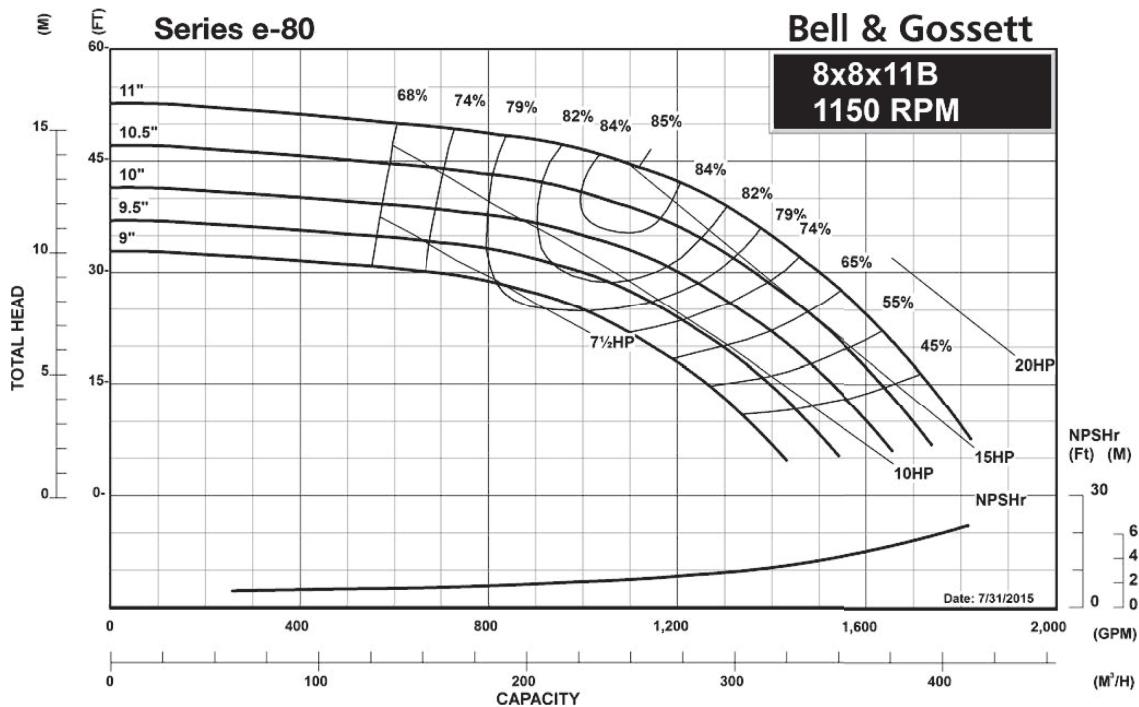
Series e-80

1200 RPM PUMP CURVES



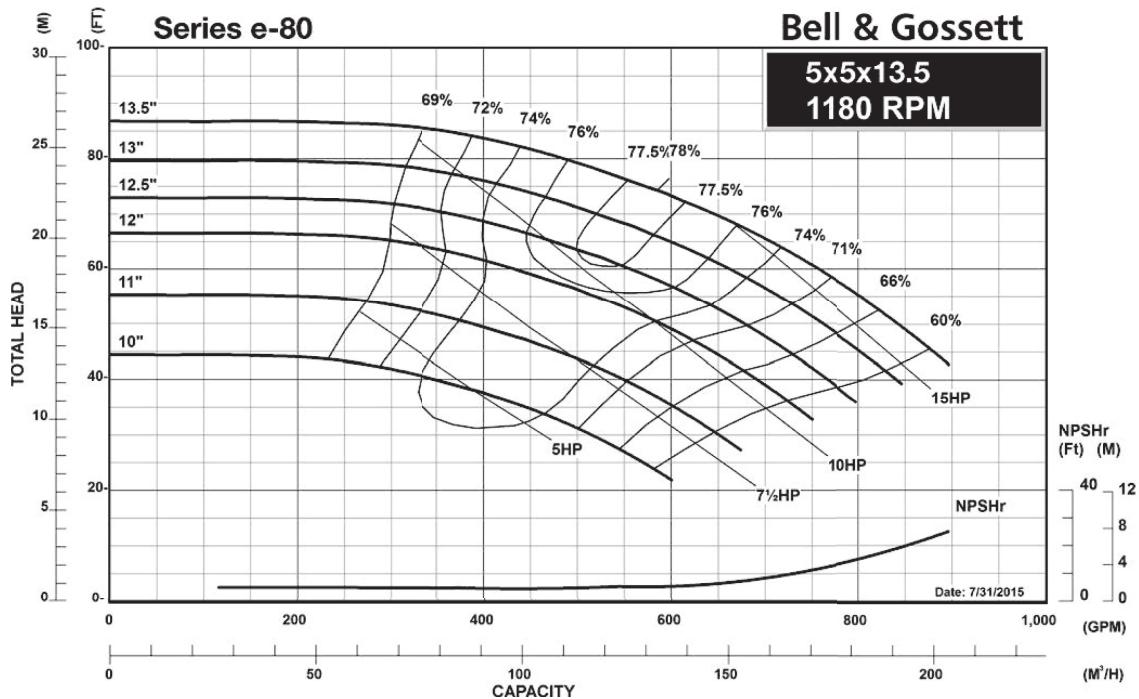
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1200 RPM PUMP CURVES



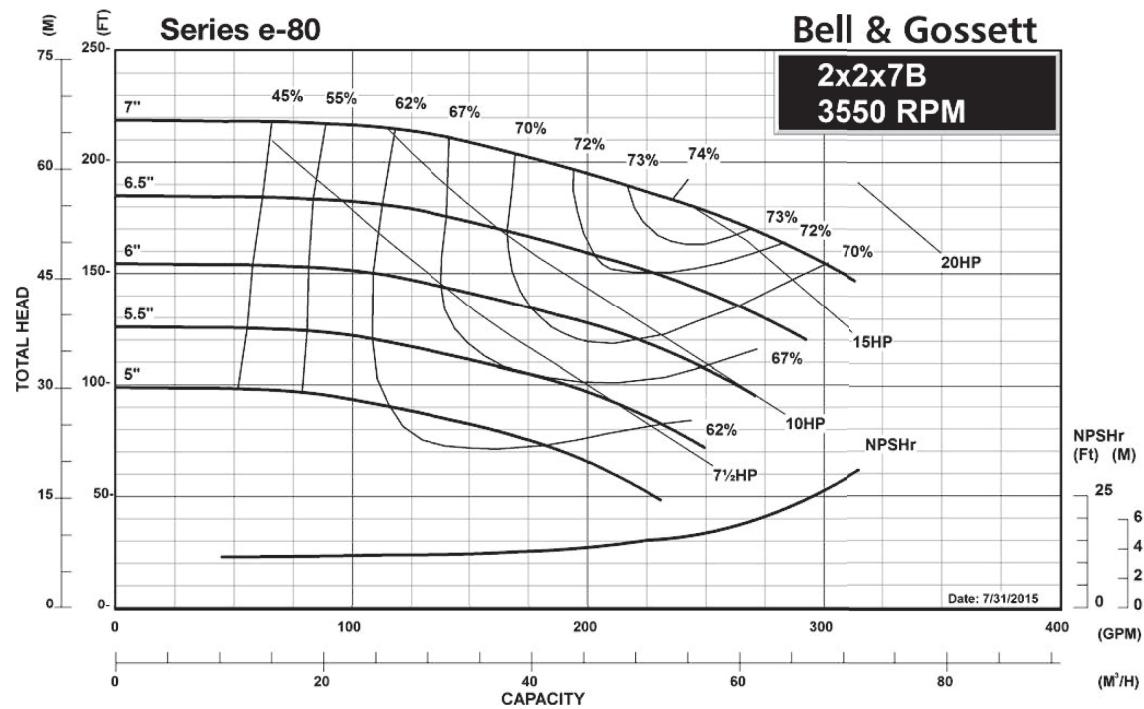
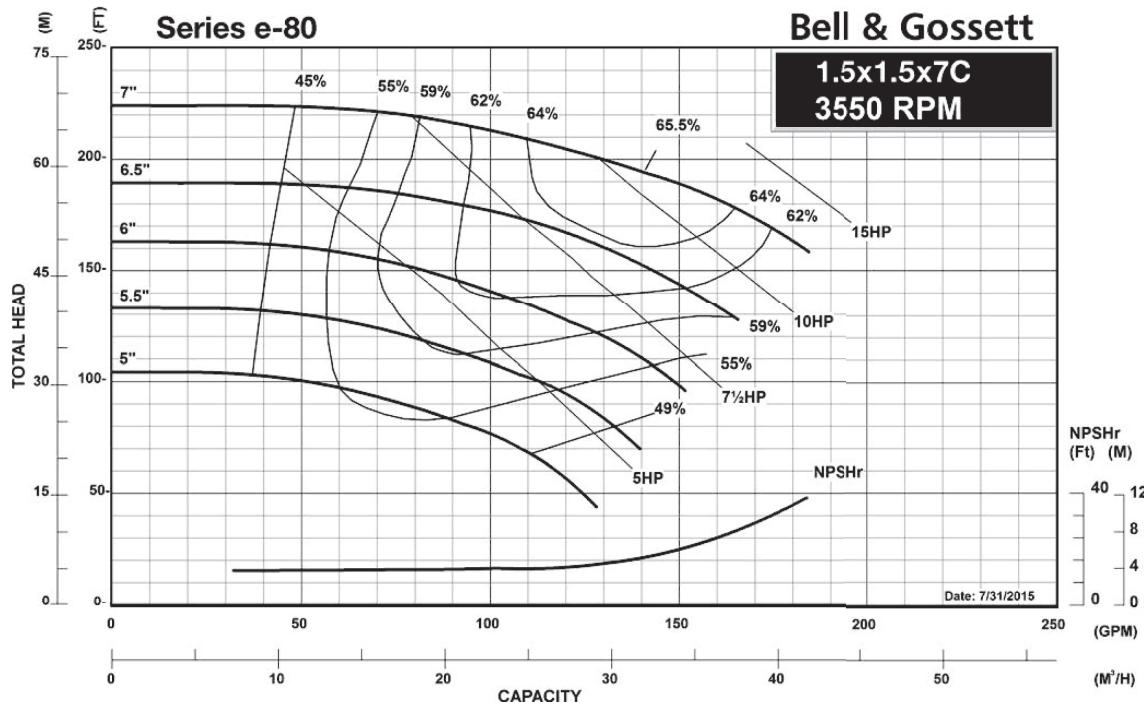
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1200 RPM PUMP CURVES



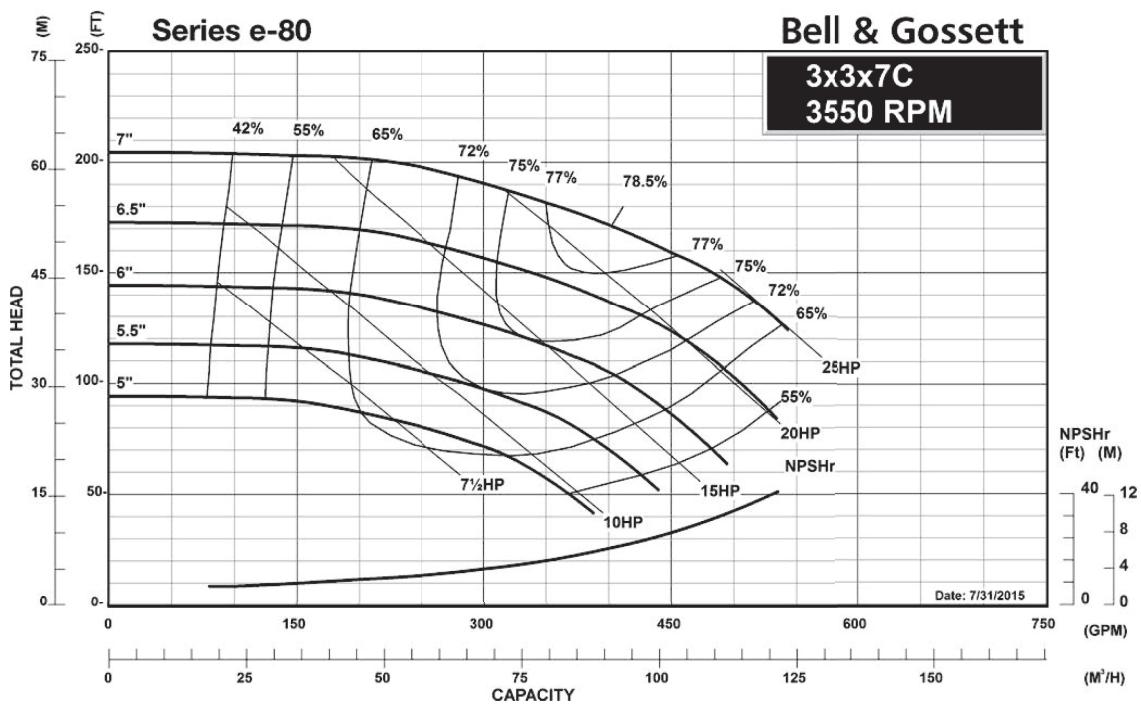
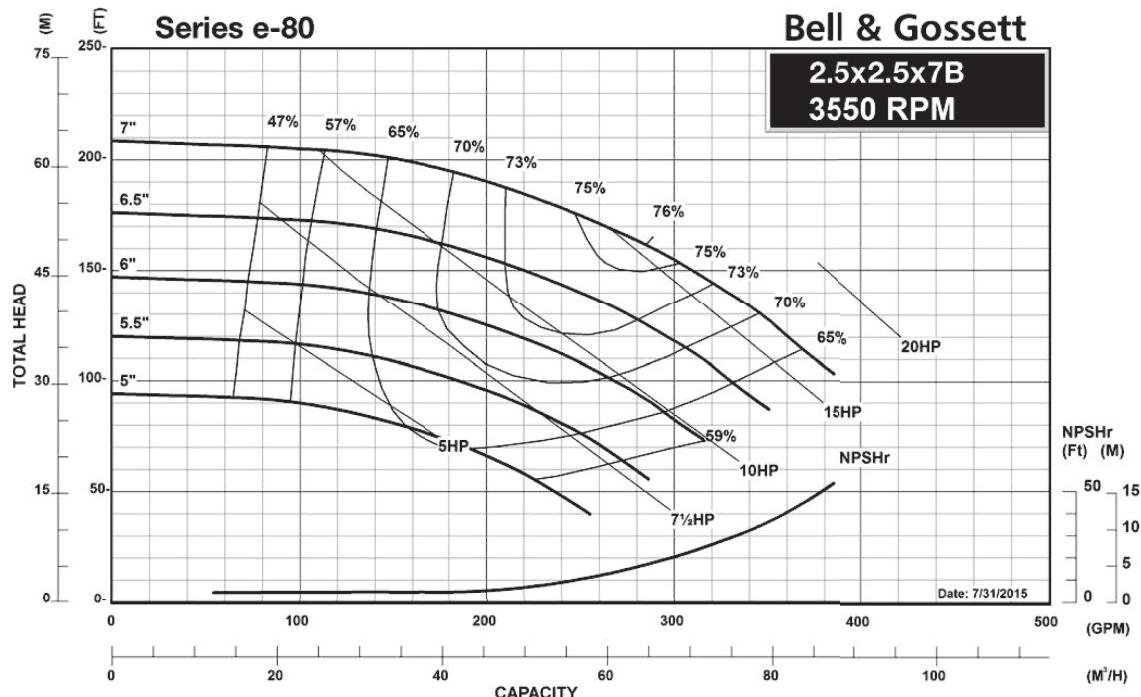
Series e-80

3600 RPM PUMP CURVES



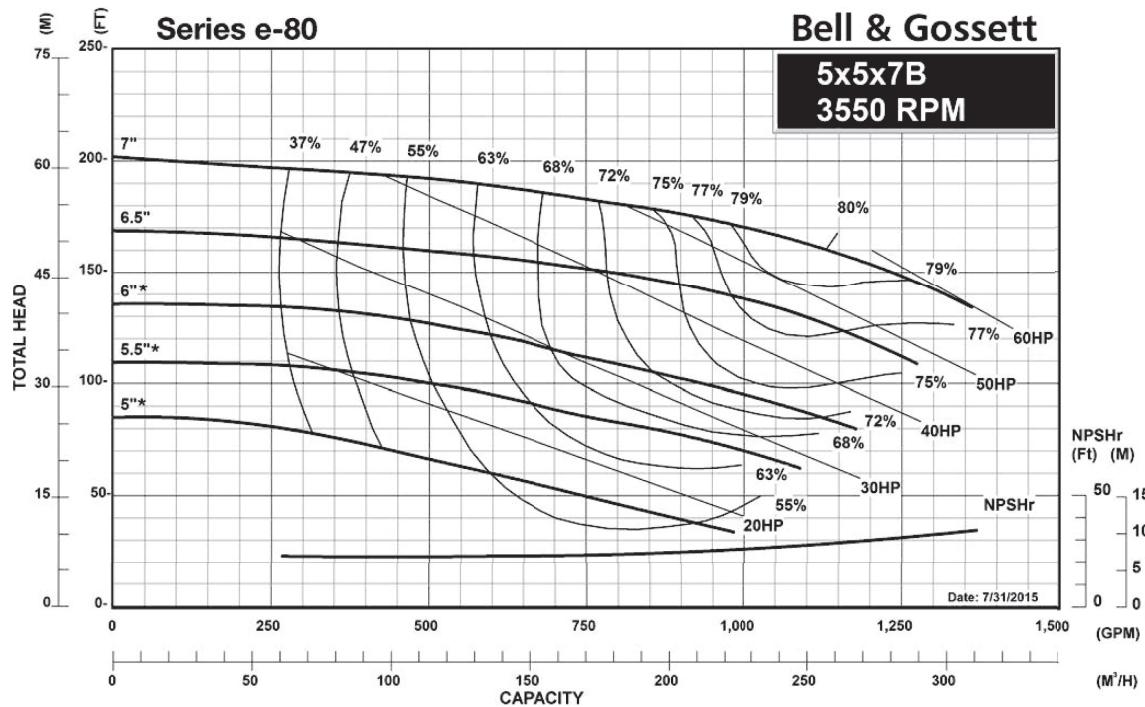
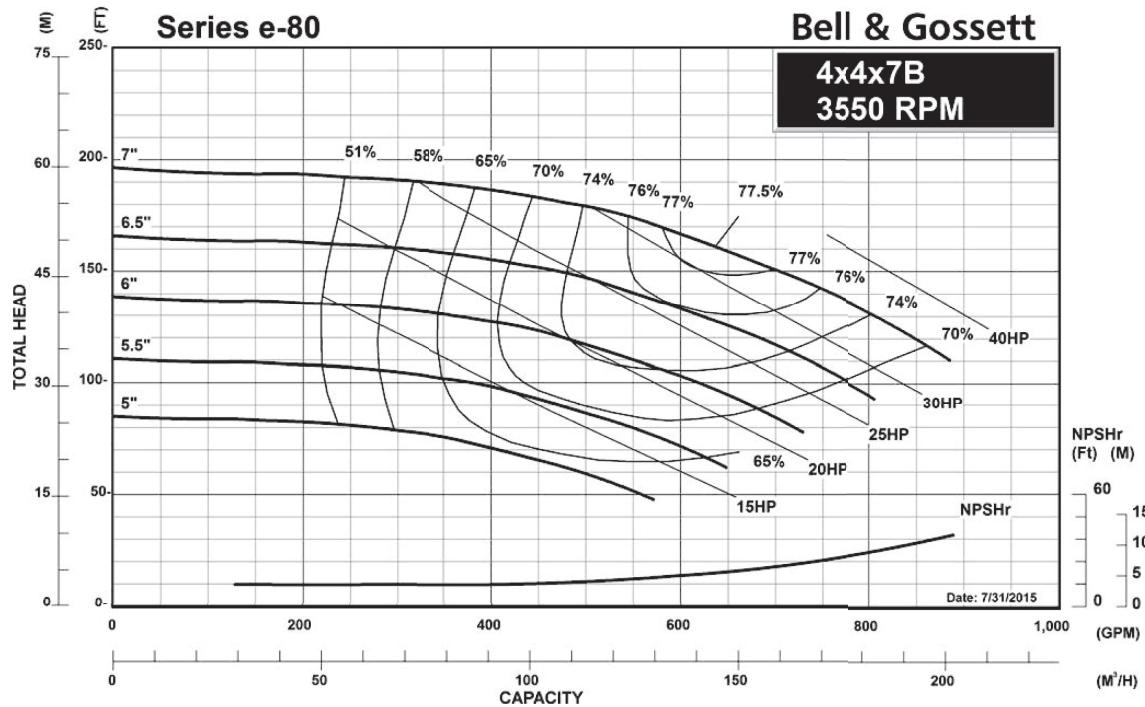
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3600 RPM PUMP CURVES



Series e-80

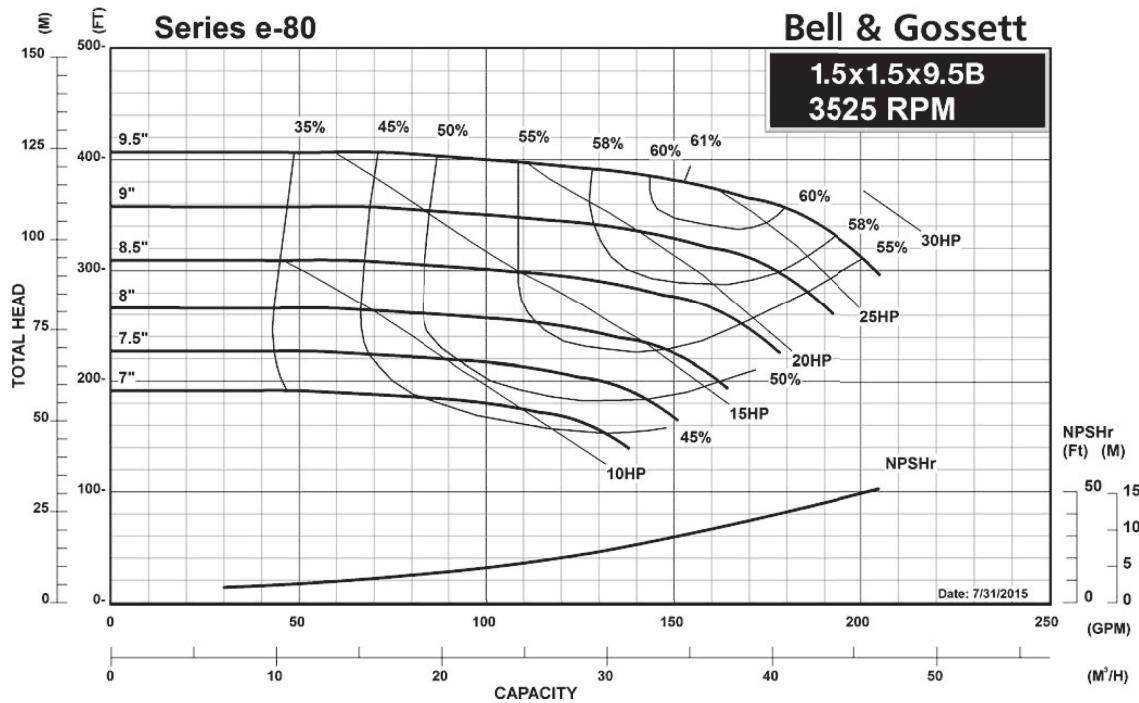
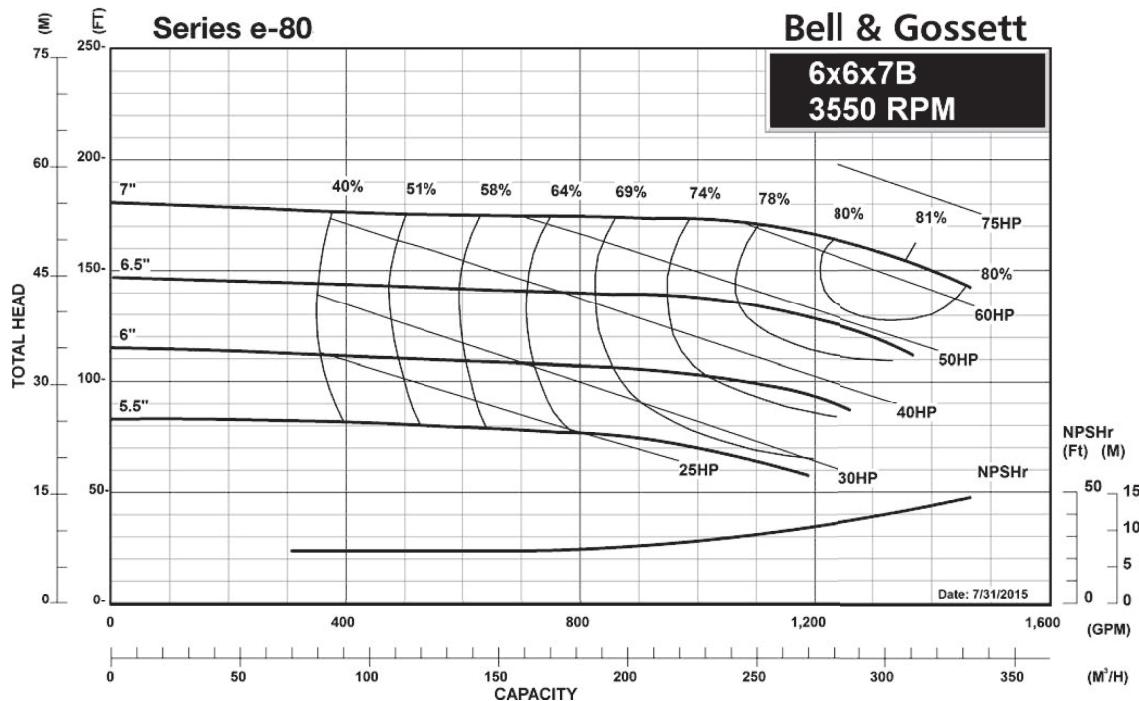
3600 RPM PUMP CURVES



*6" and below requires oversized diameter and angle trim. See manual.

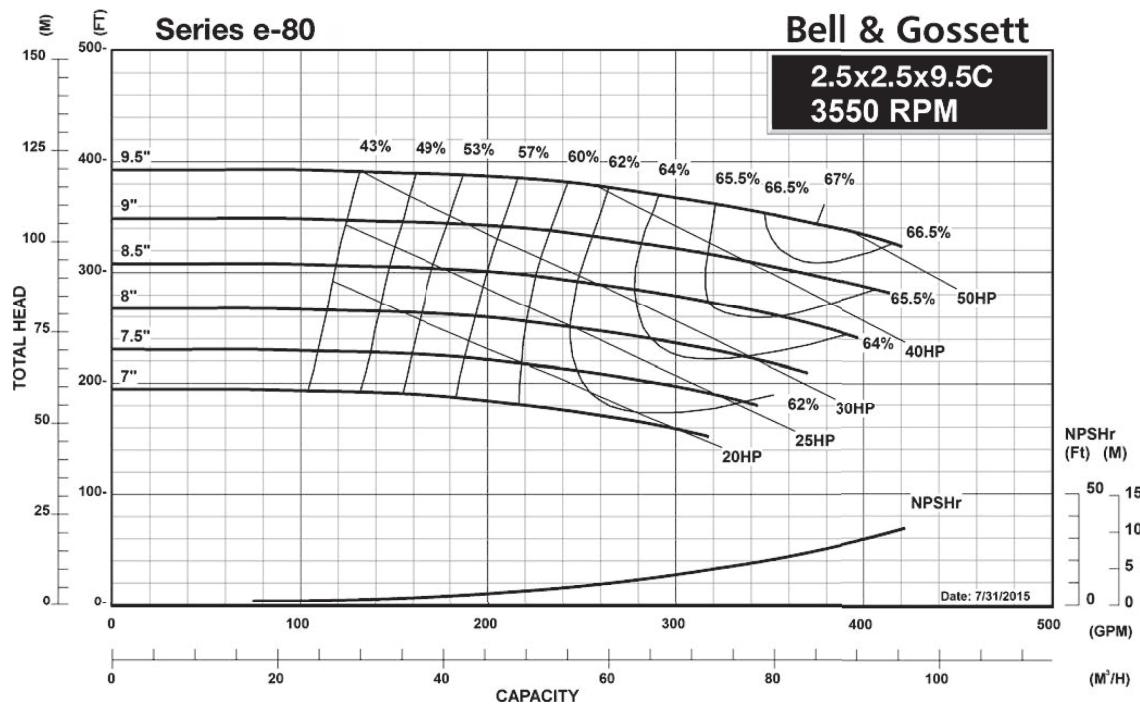
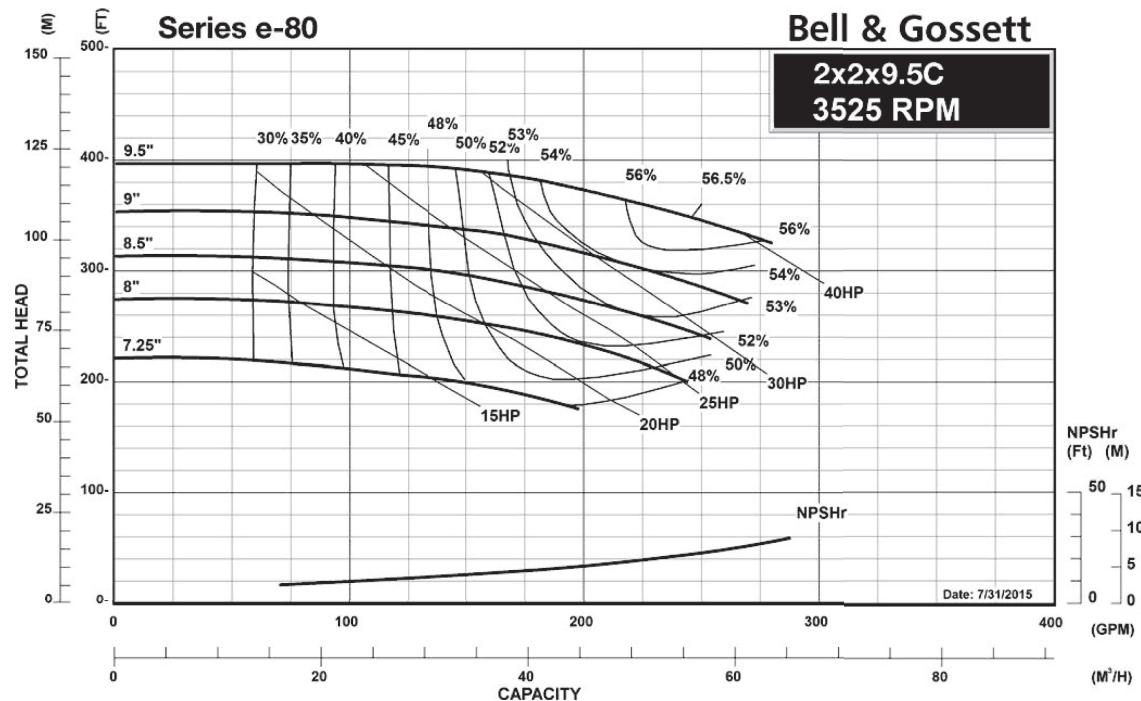
Series e-80

3600 RPM PUMP CURVES



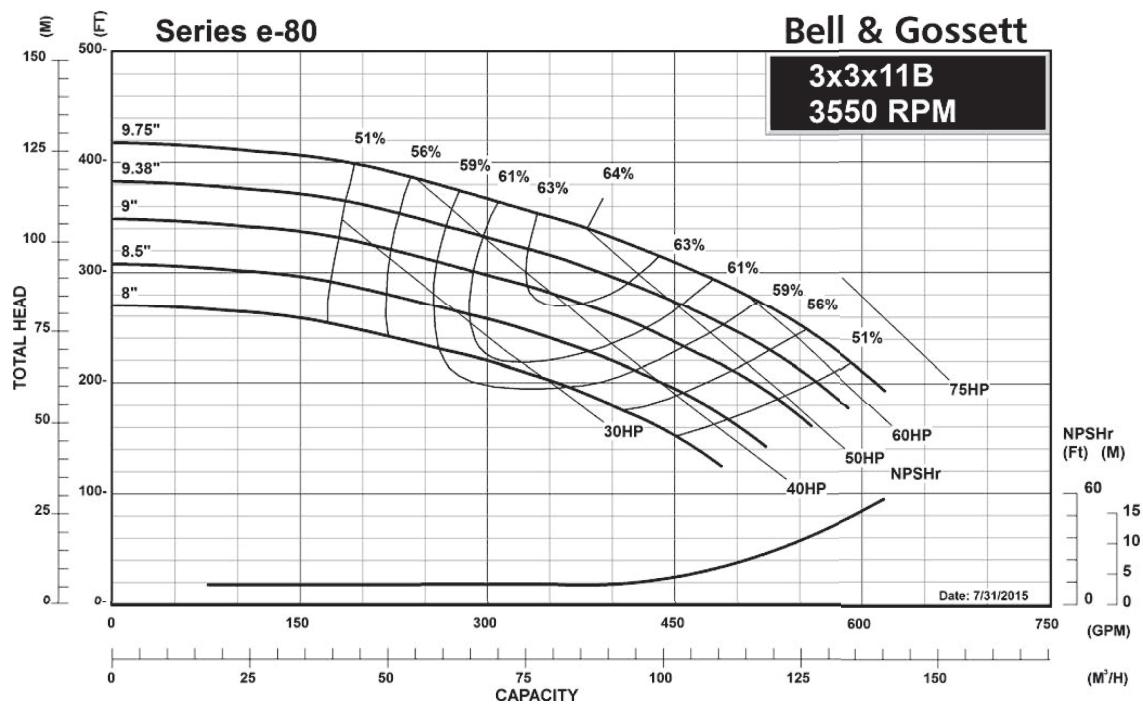
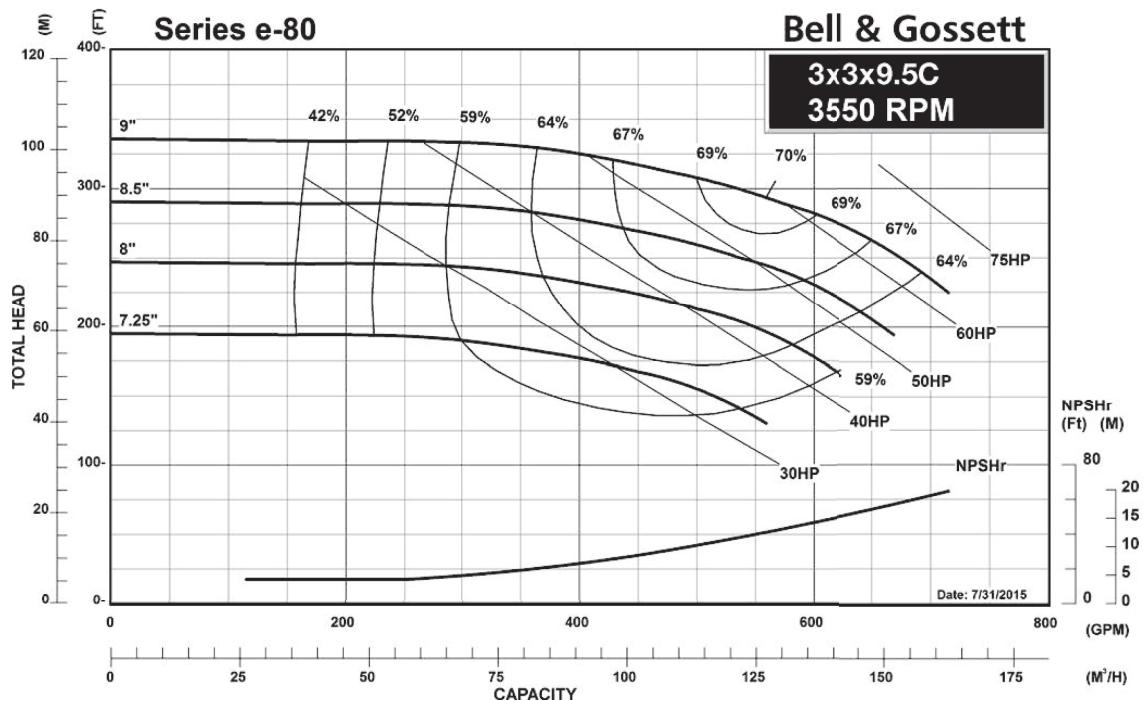
Series e-80

3600 RPM PUMP CURVES



Series e-80

3600 RPM PUMP CURVES



Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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CURVES
B-263A



Series e-1531

CLOSED COUPLED CENTRIFUGAL PUMP PERFORMANCE CURVES – 60 HZ



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USEFUL PUMP FORMULAS

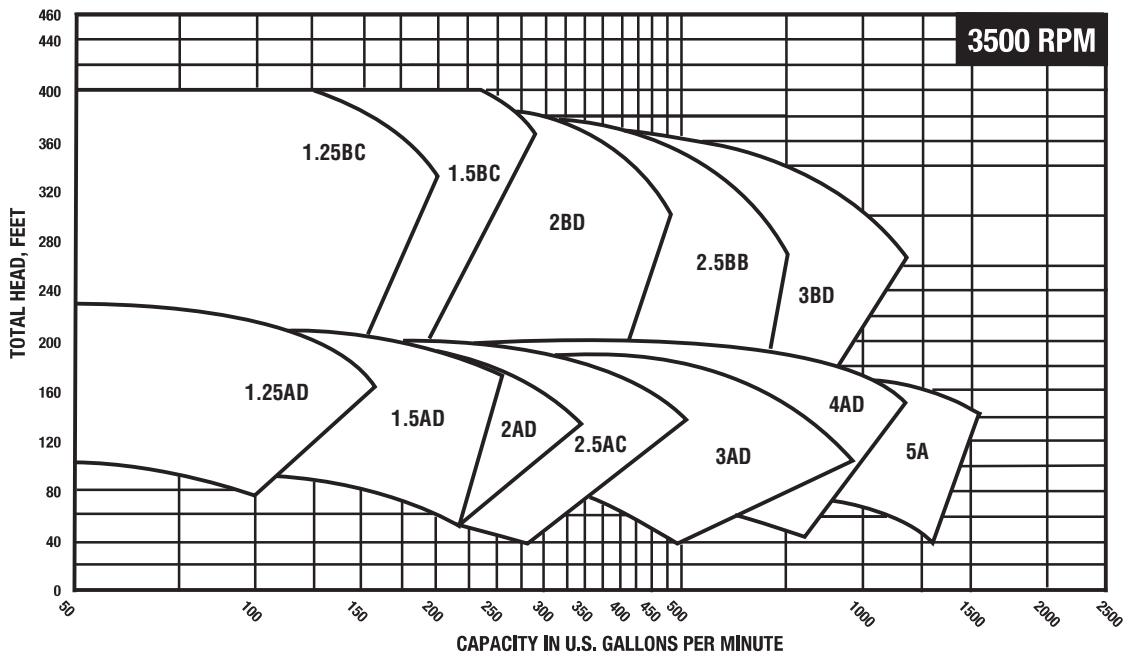
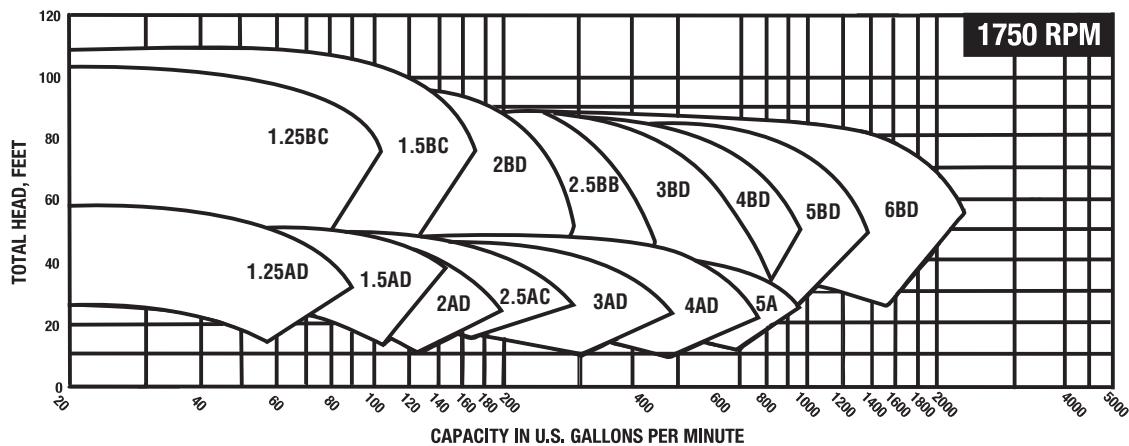
$$\begin{aligned}
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 \text{Head (Feet)} &= \frac{\text{Pressure (PSI)} \times 2.31}{\text{Specific Gravity}} \\
 \text{Vacuum (Inches of Mercury)} &= \frac{\text{Dynamic Suction Lift (Feet)} \times .883}{\text{Specific Gravity}} \\
 \text{Horsepower (Brake)} &= \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960 \times \text{Pump Efficiency}} \\
 \text{Horsepower (Water)} &= \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960} \\
 \text{Efficiency (Pump)} &= \frac{\text{Horsepower (Water)}}{\text{Horsepower (Brake)}} \times 100 \text{ Per Cent} \\
 \text{NPSH (Available)} &= \text{Positive Factors} - \text{Negative Factors}
 \end{aligned}$$

Affinity Laws: Effect of change of speed or impeller diameter on centrifugal pumps.

	GPM Capacity	Ft. Head	BHP
Impeller Diameter Change	$Q_2 = \frac{D_2}{D_1} Q_1$	$H_2 = \left(\frac{D_2}{D_1}\right)^2 H_1$	$P_2 = \left(\frac{D_2}{D_1}\right)^3 P_1$
Speed Change	$Q_2 = \frac{\text{RPM}_2}{\text{RPM}_1} Q_1$	$H_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^2 H_1$	$P_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^3 P_1$

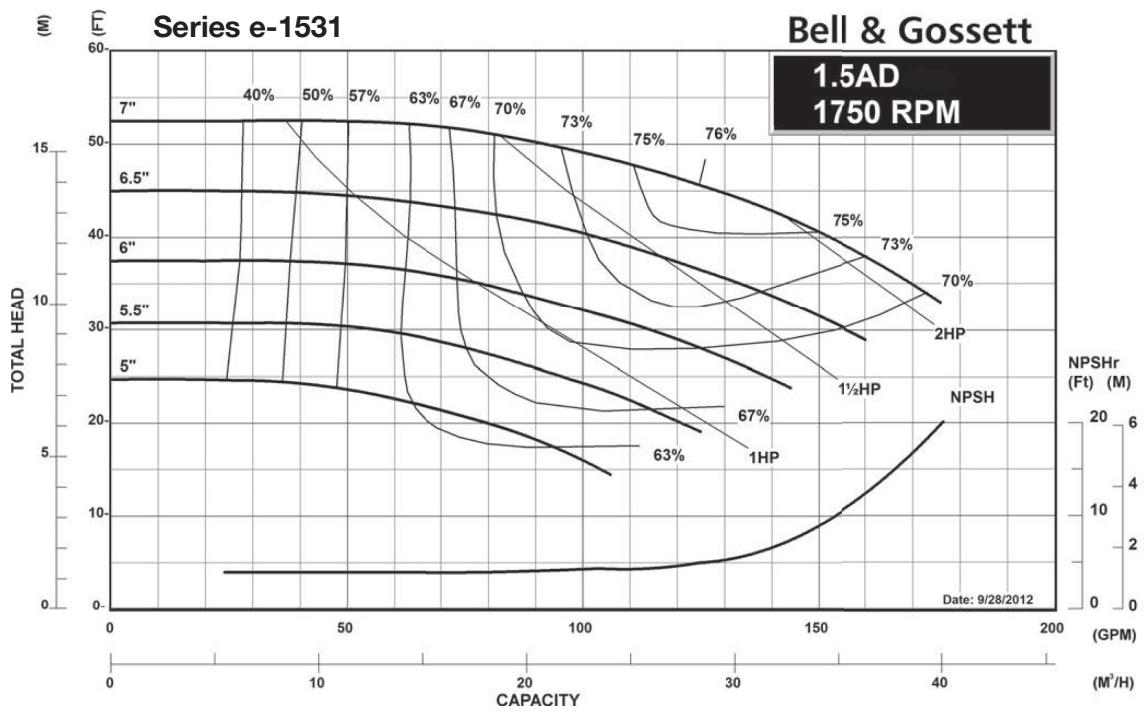
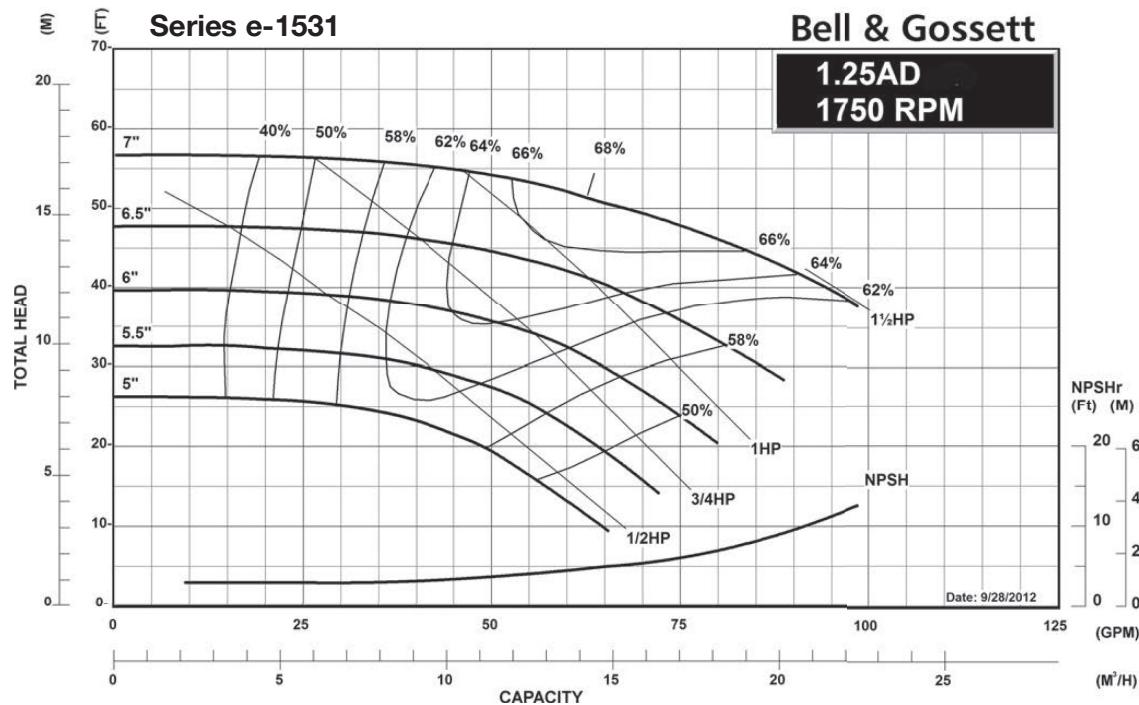
Where Q = GPM, H = Head, P = BHP, D = Impeller Dia., RPM = Pump Speed

Series e-1531 Selection Charts



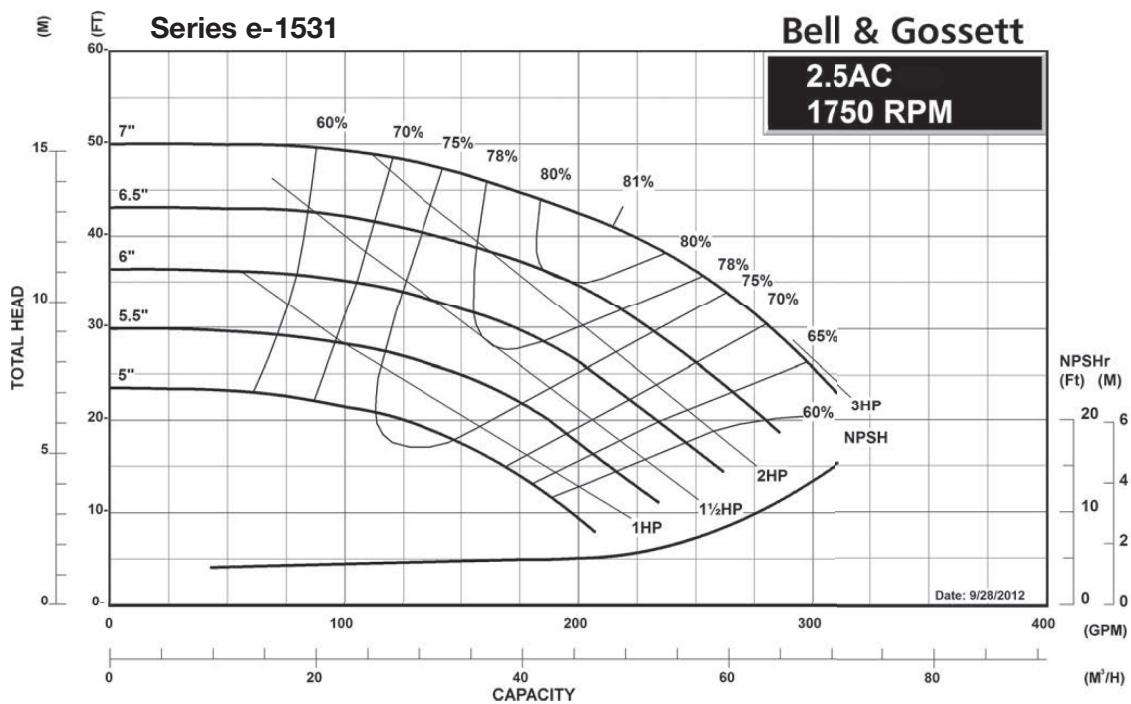
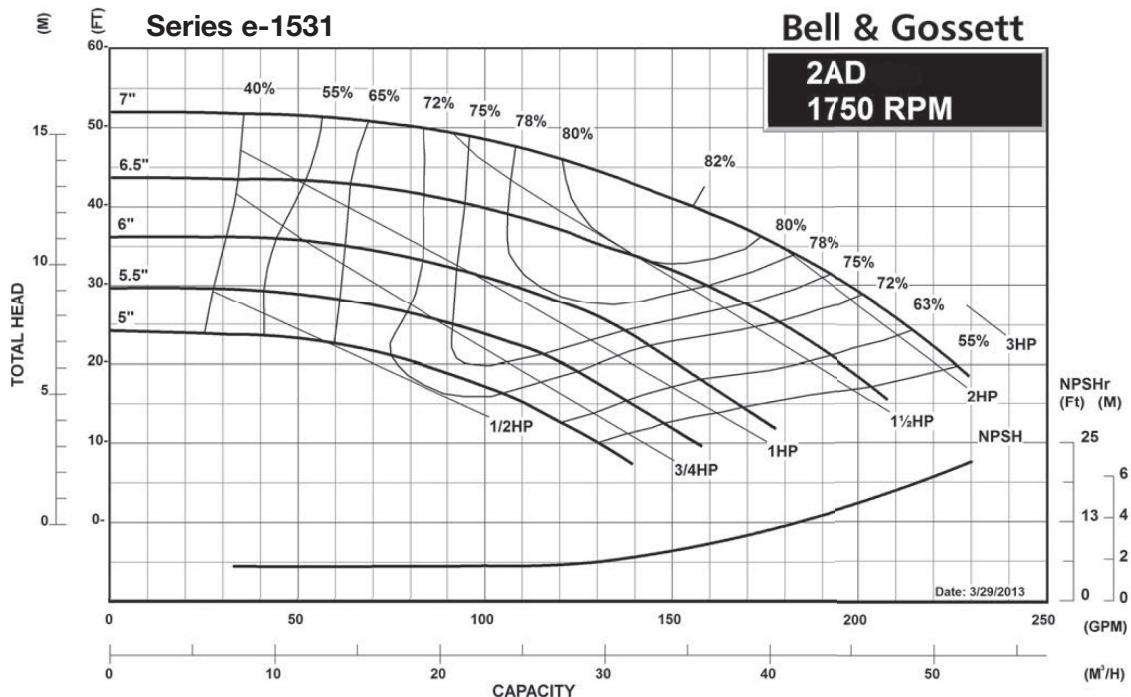
SERIES e-1531

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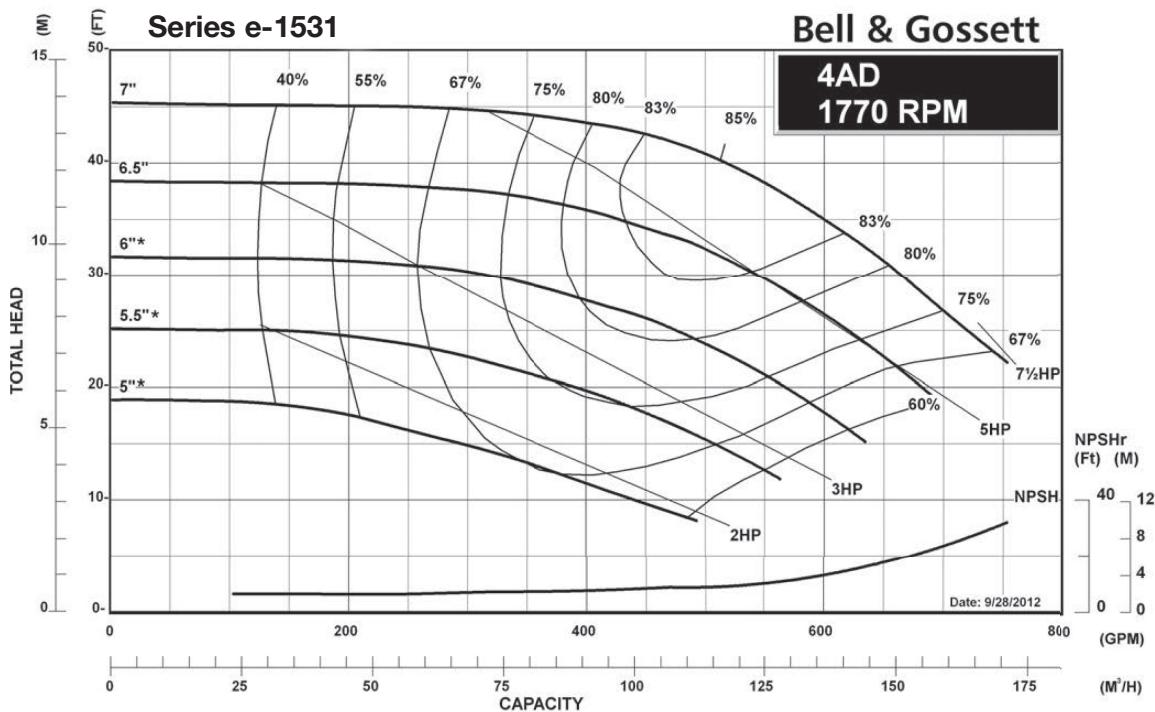
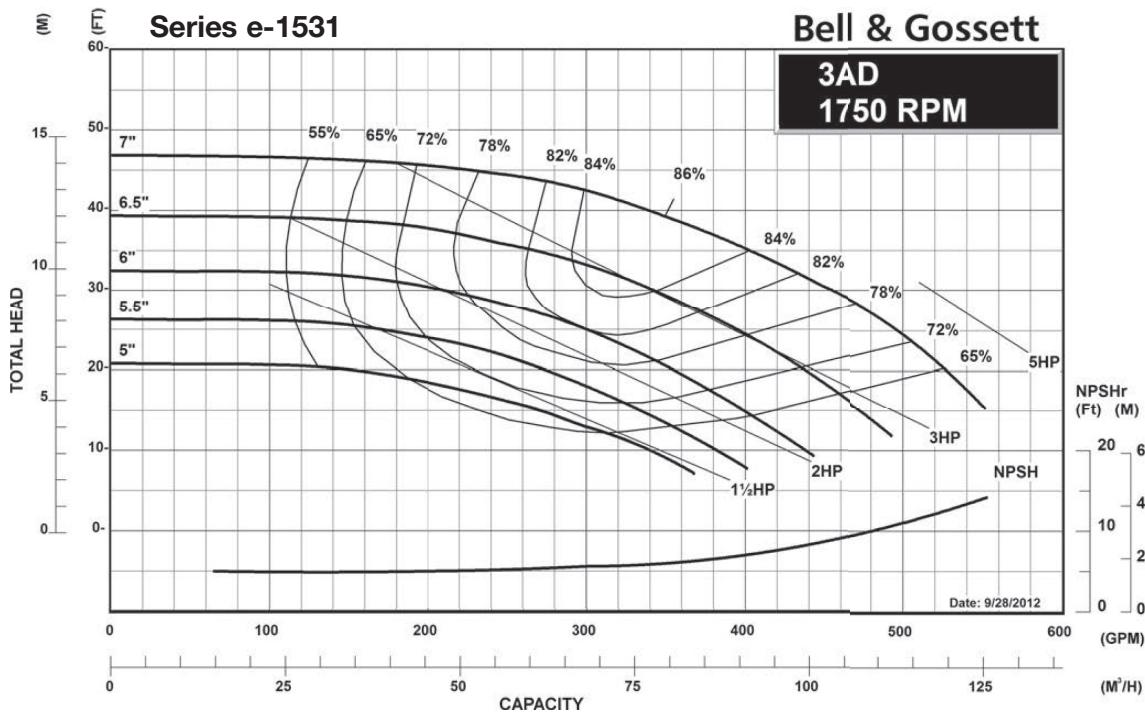
SERIES e-1531

1800 RPM SYNCHRONOUS SPEED



SERIES e-1531

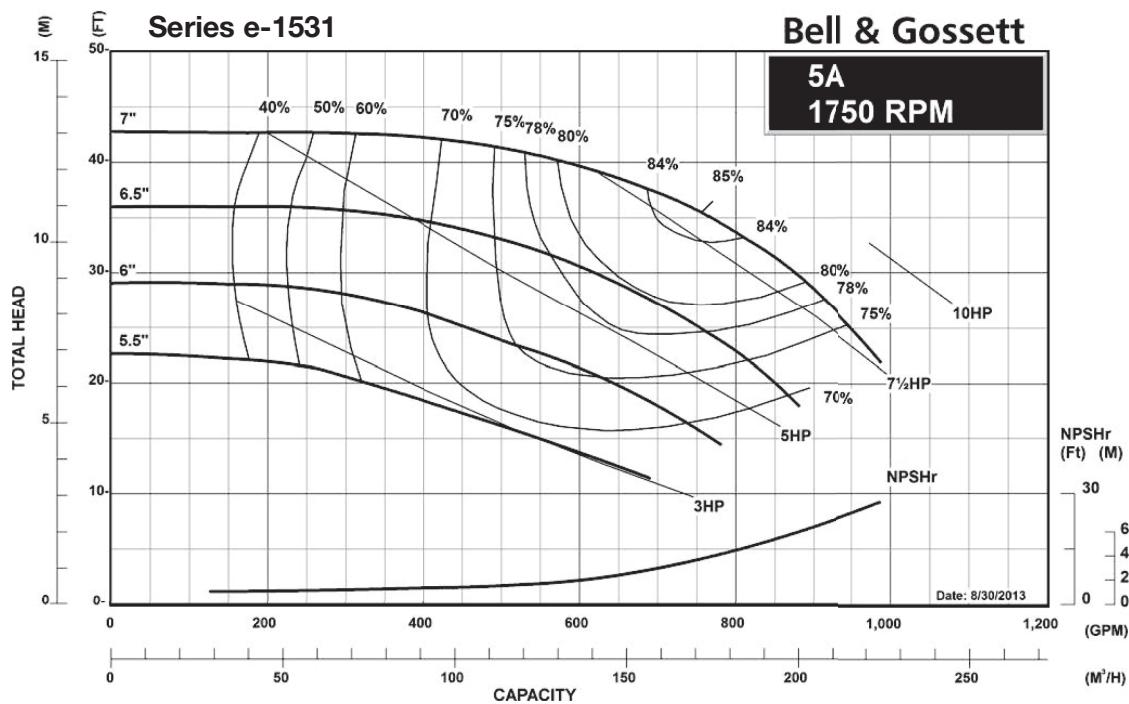
1800 RPM SYNCHRONOUS SPEED



* 6" and below requires oversized diameter and angle trim. See manual.

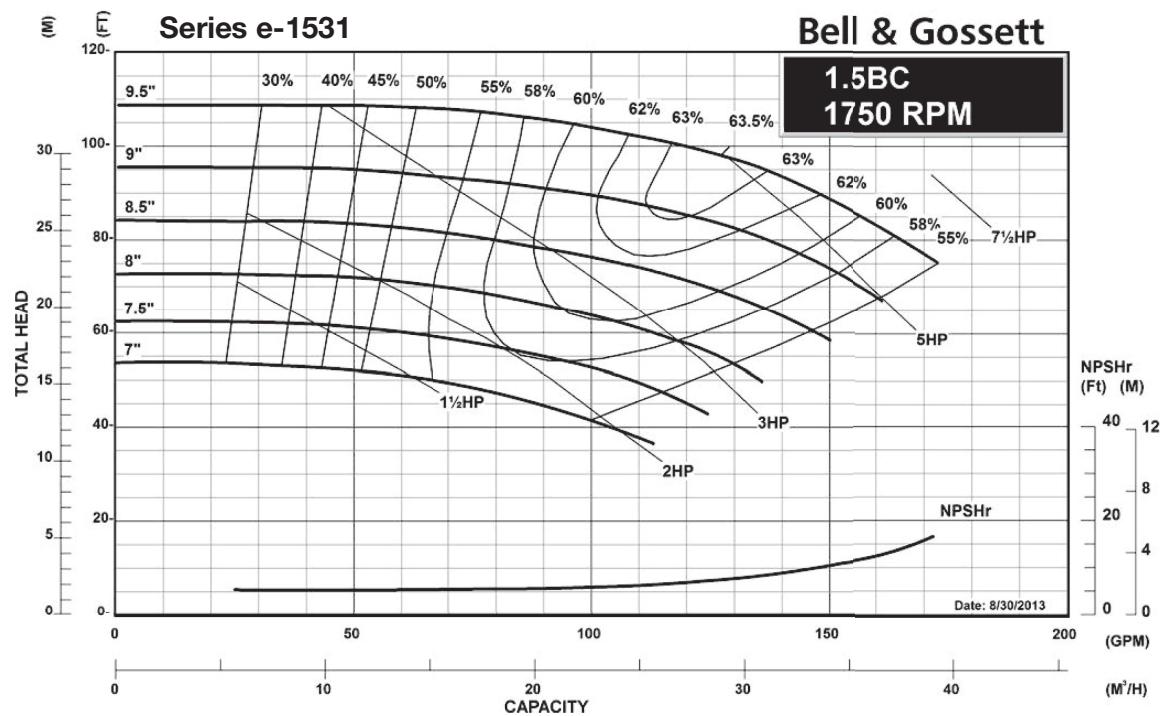
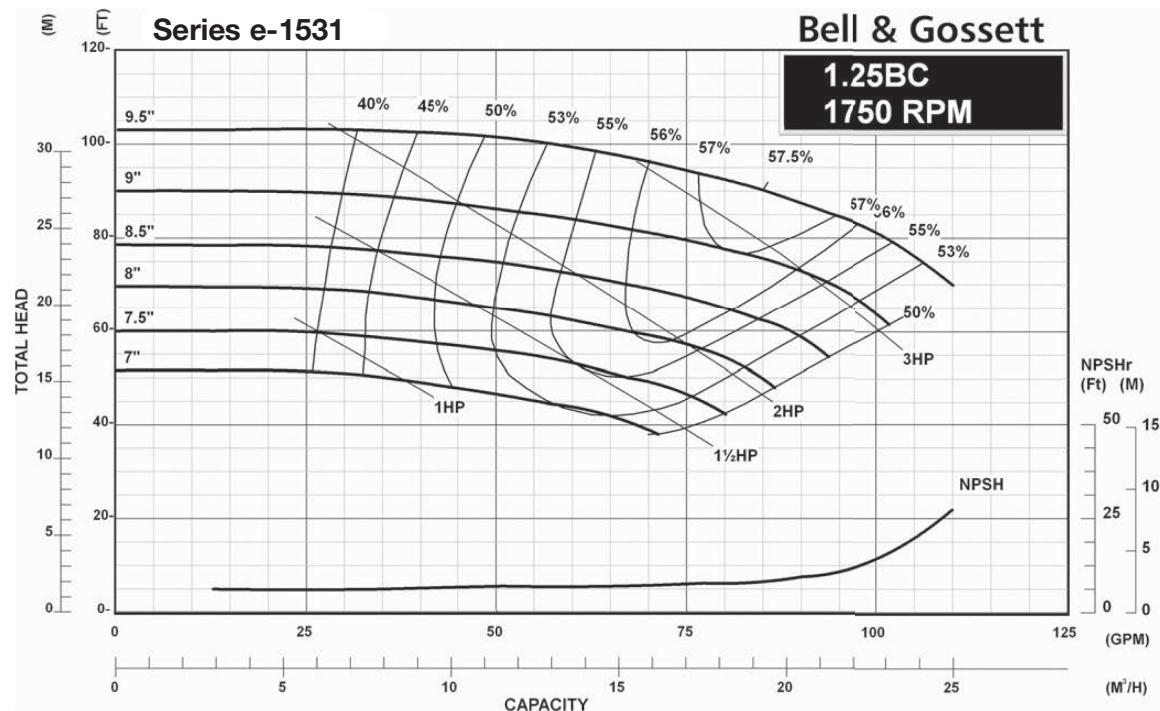
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1800 RPM SYNCHRONOUS SPEED



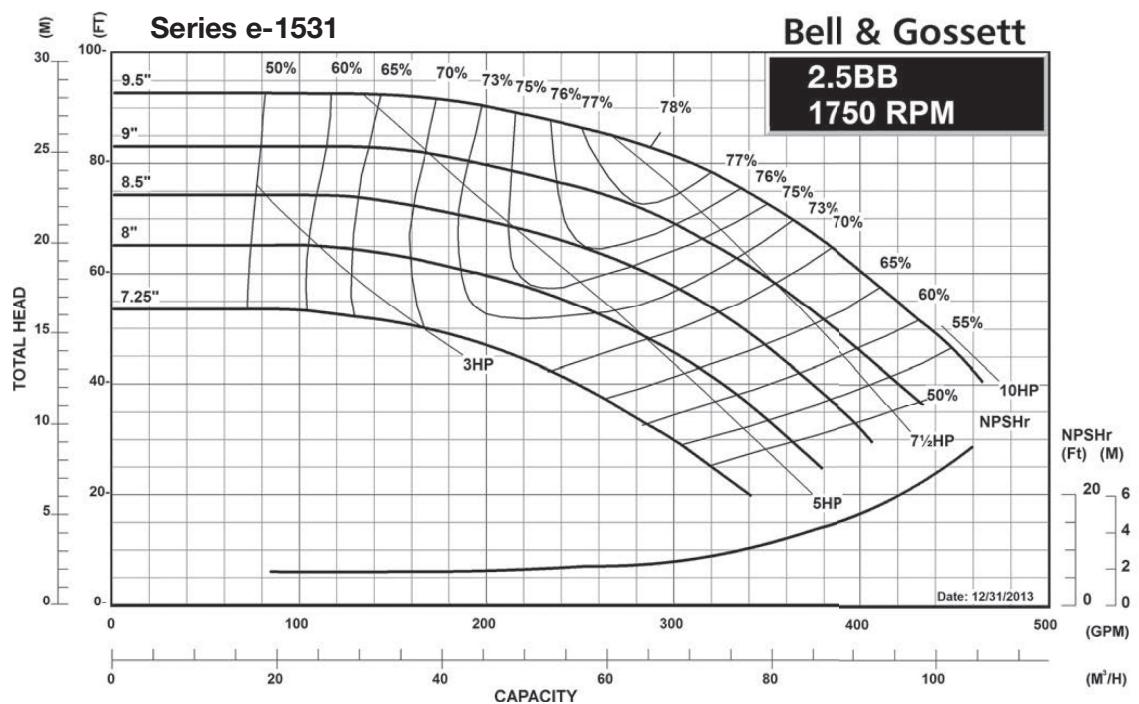
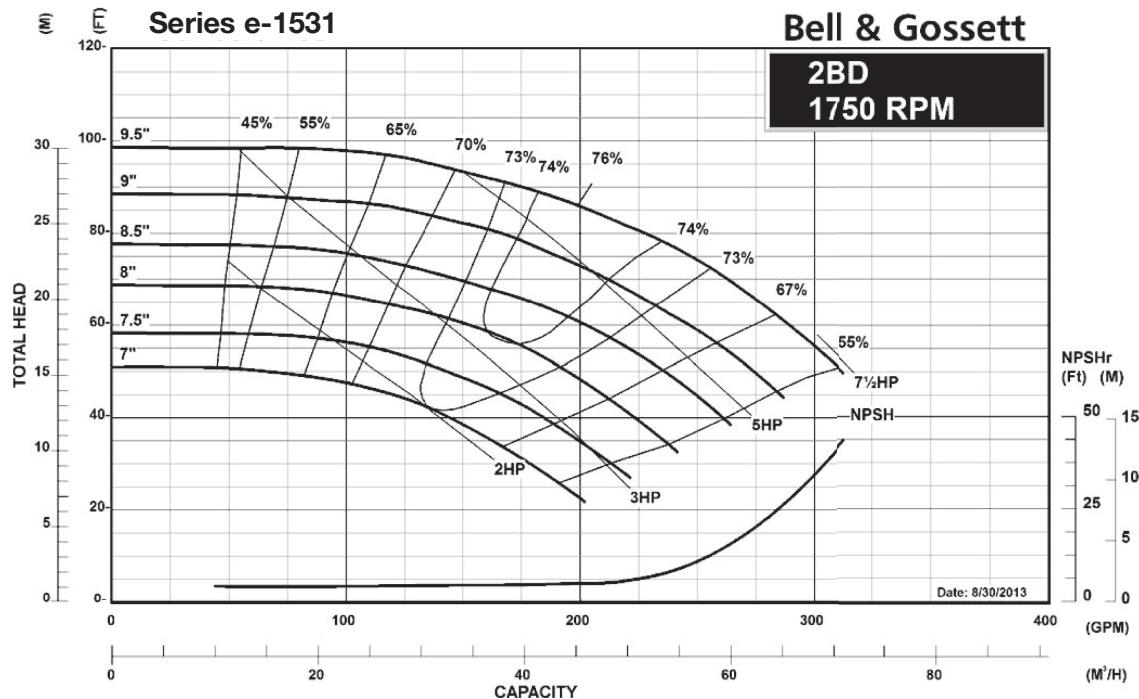
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1800 RPM SYNCHRONOUS SPEED



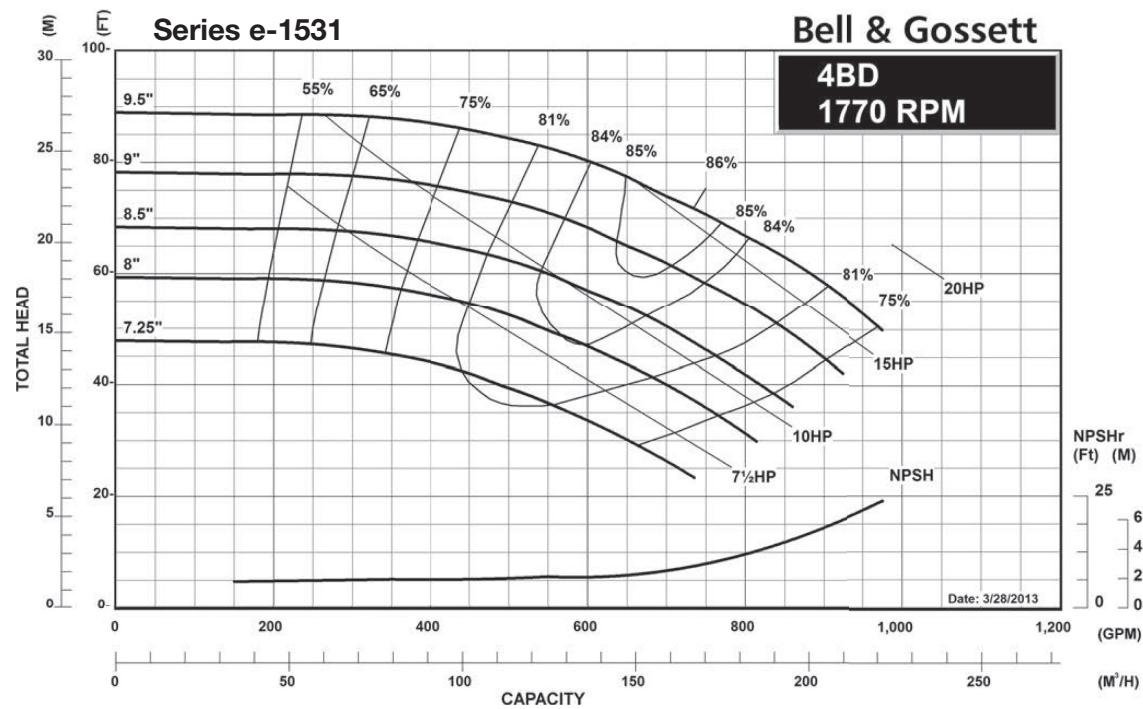
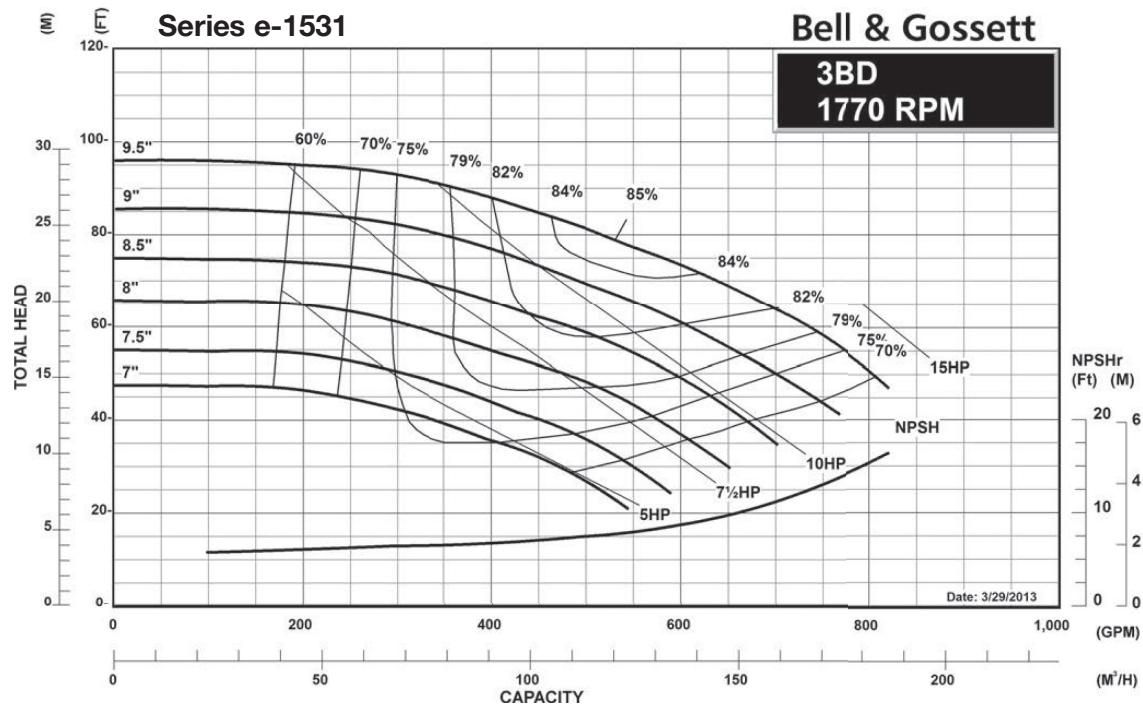
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1800 RPM SYNCHRONOUS SPEED



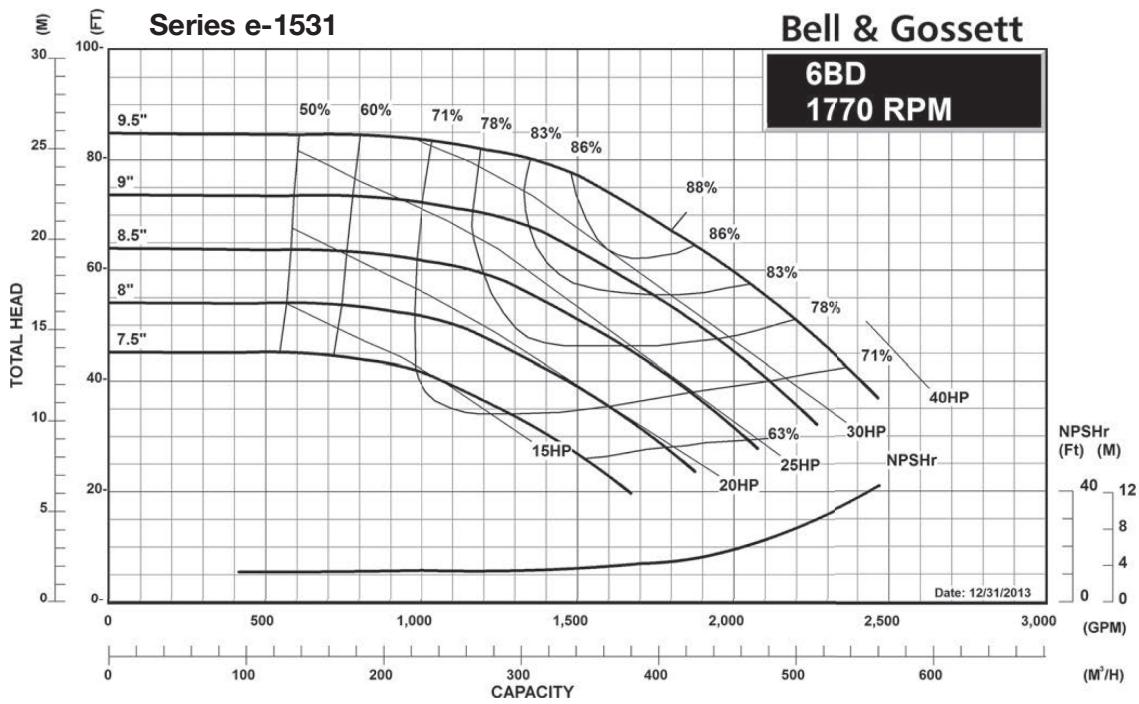
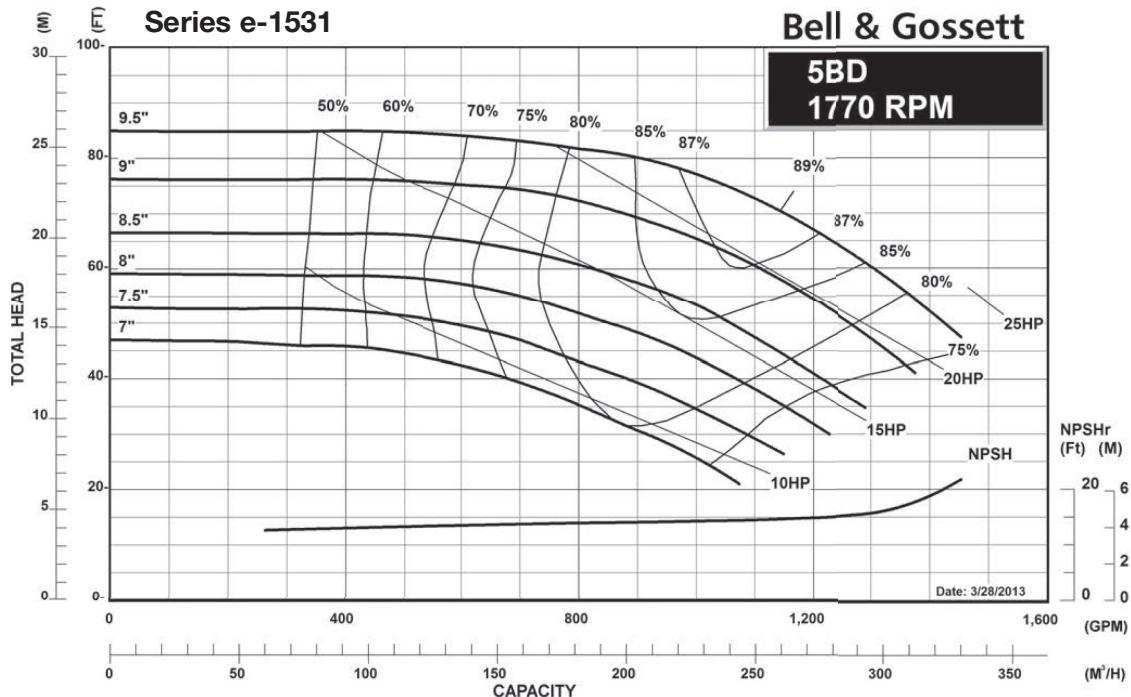
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1800 RPM SYNCHRONOUS SPEED



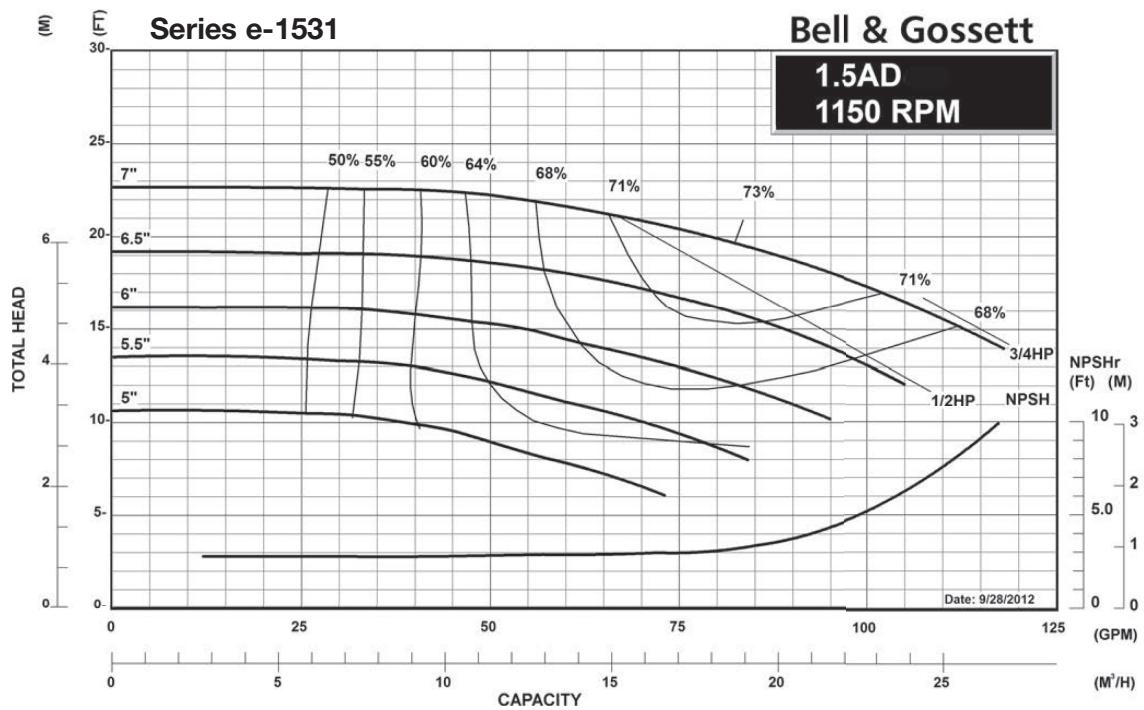
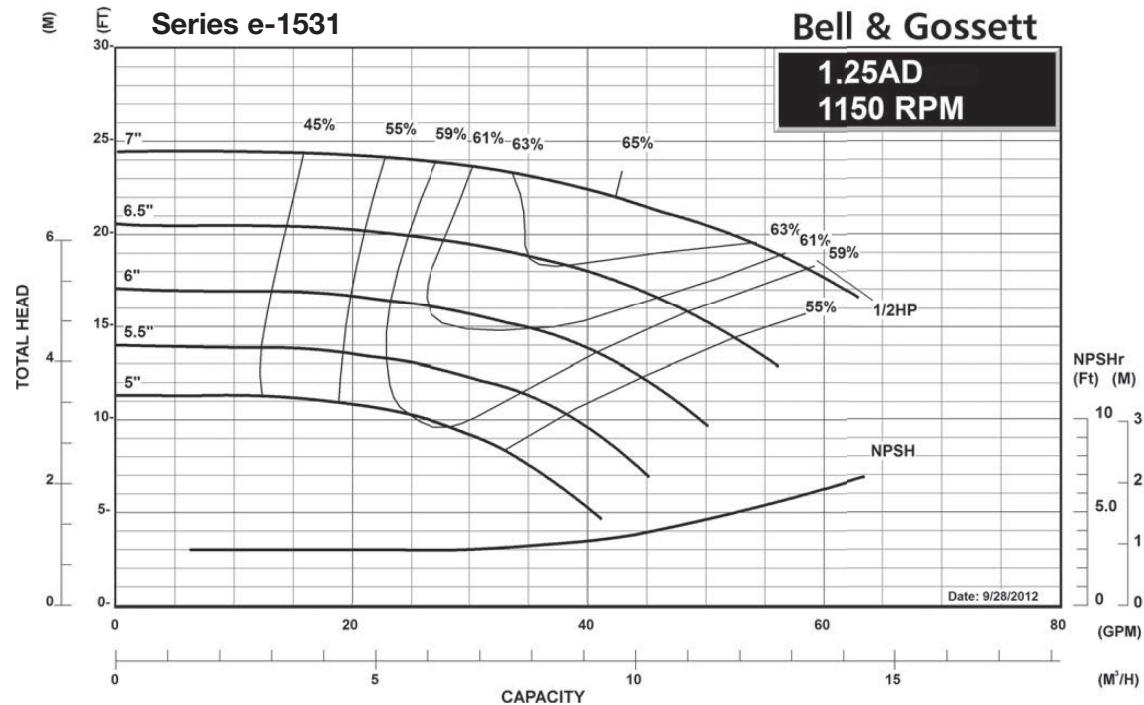
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1800 RPM SYNCHRONOUS SPEED



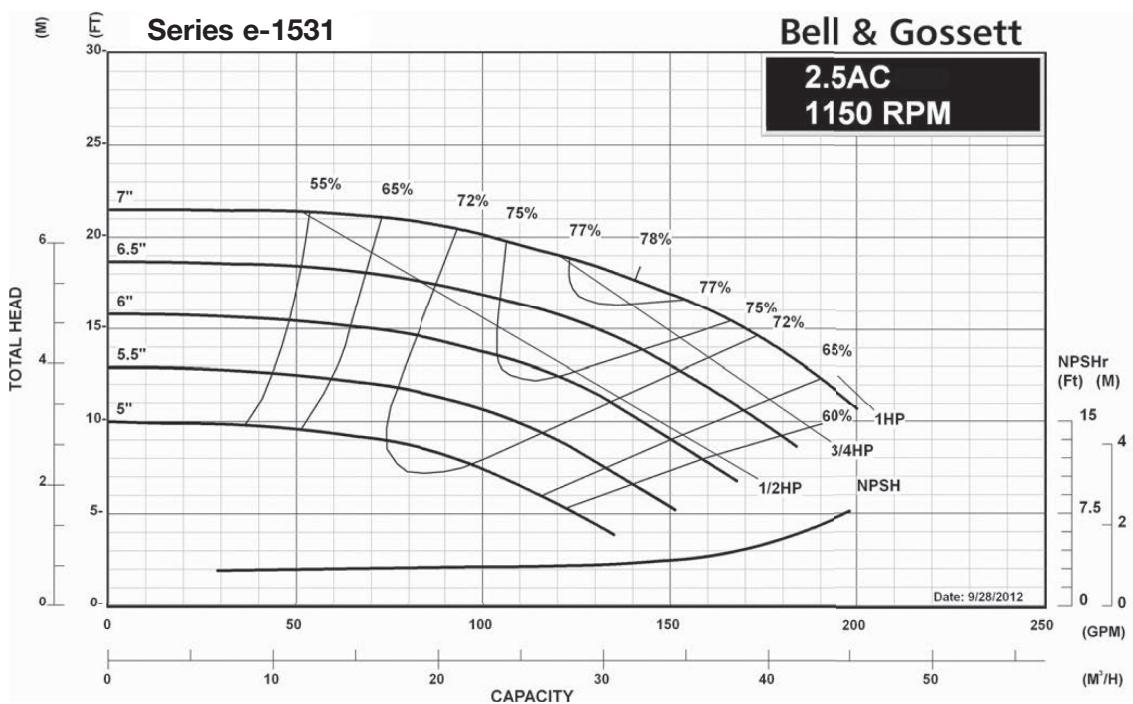
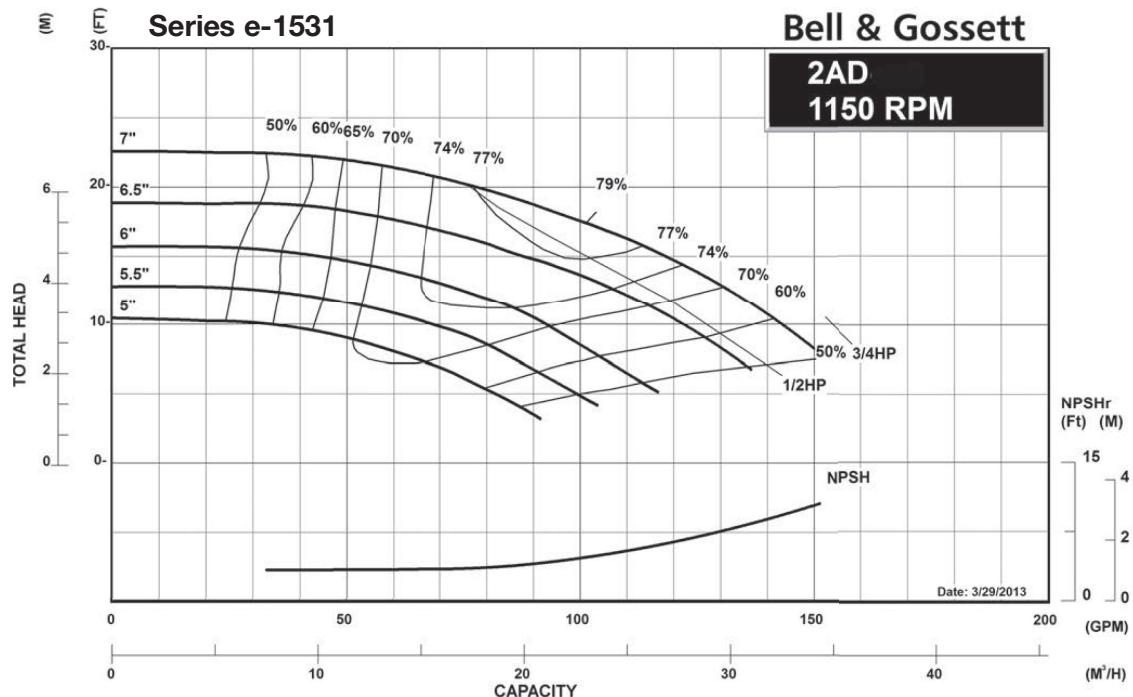
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1200 RPM SYNCHRONOUS SPEED



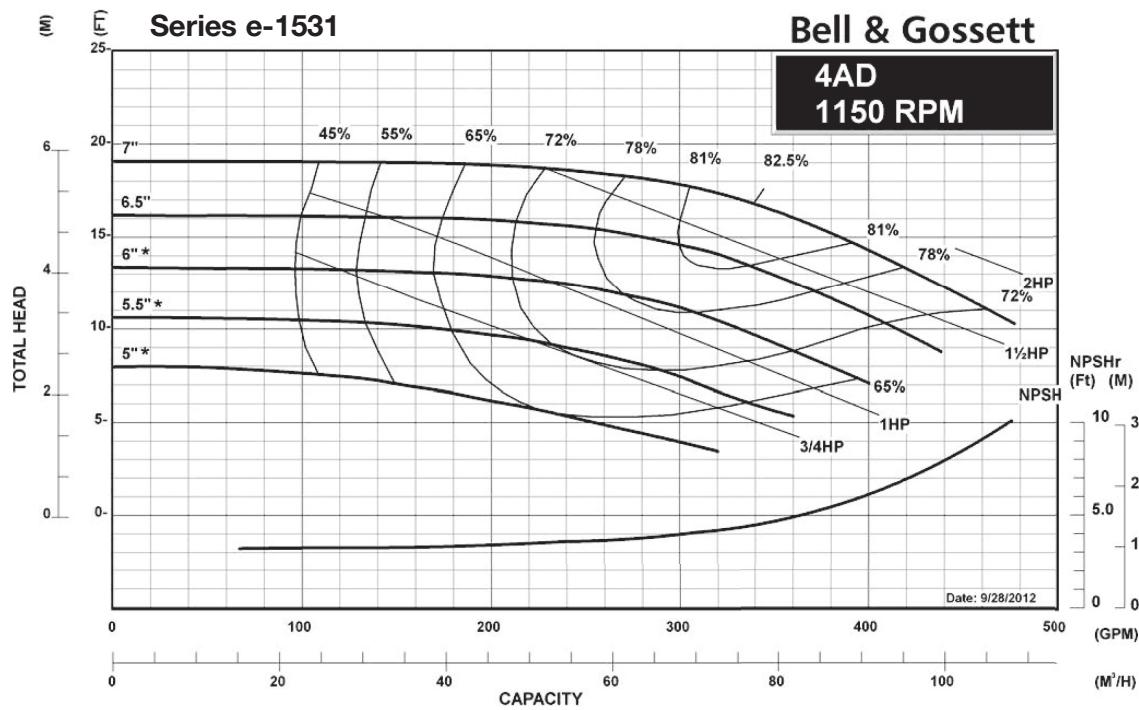
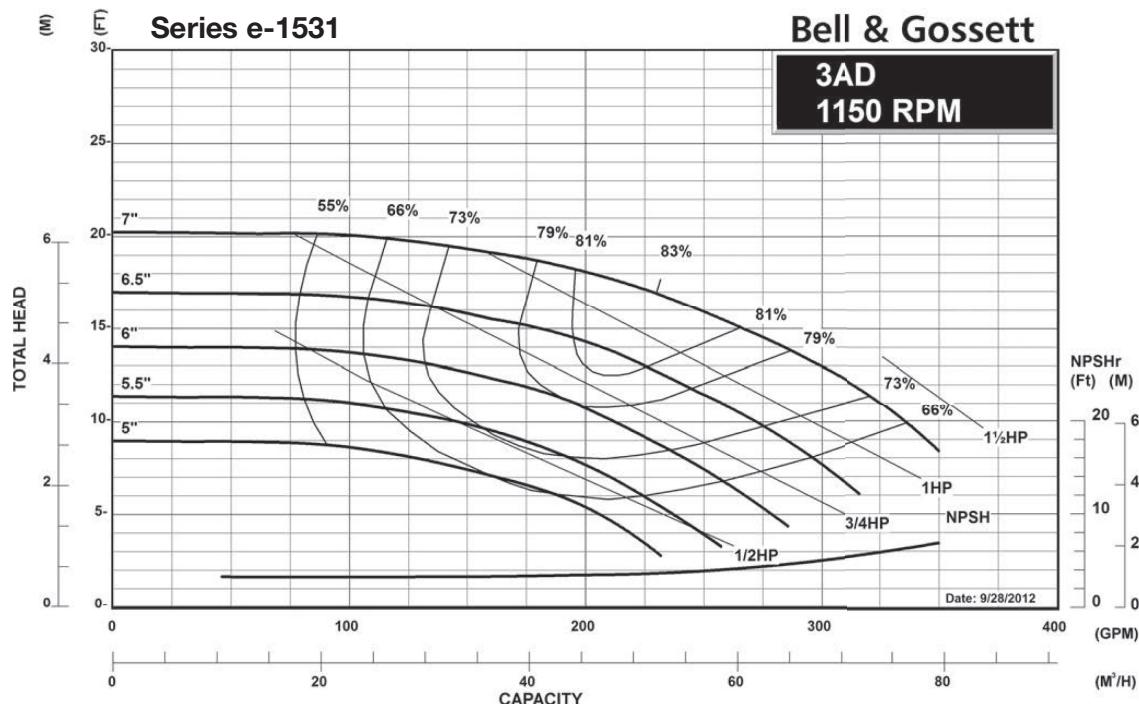
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1200 RPM SYNCHRONOUS SPEED



SERIES e-1531

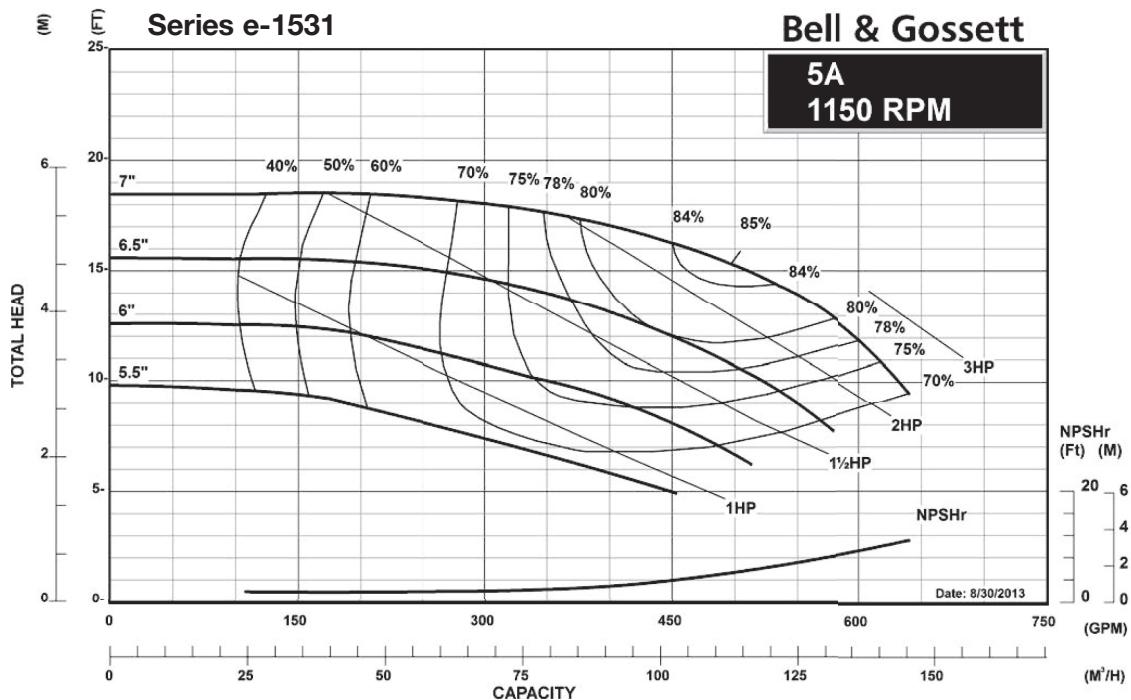
1200 RPM SYNCHRONOUS SPEED



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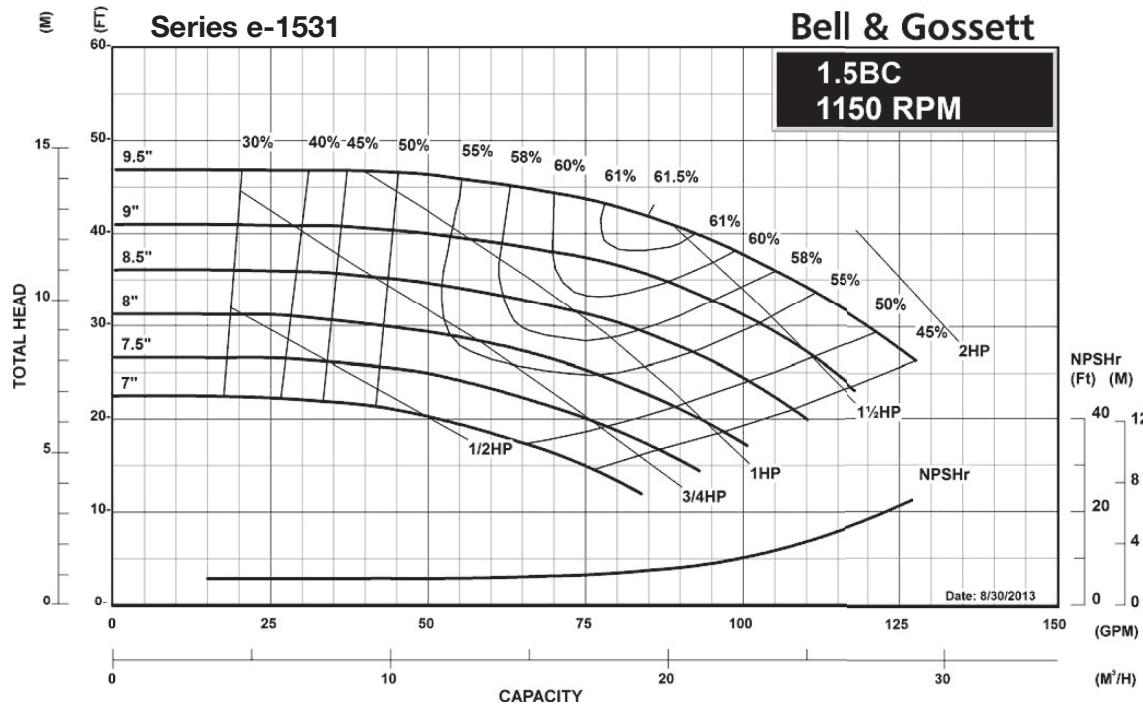
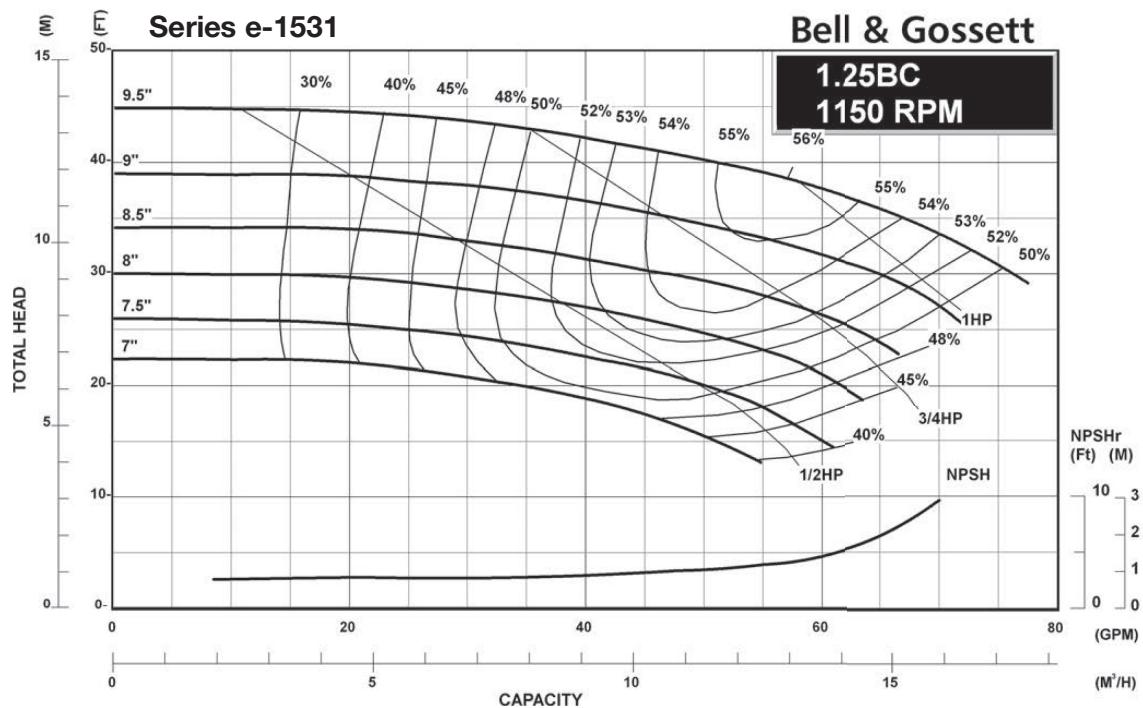
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1200 RPM SYNCHRONOUS SPEED



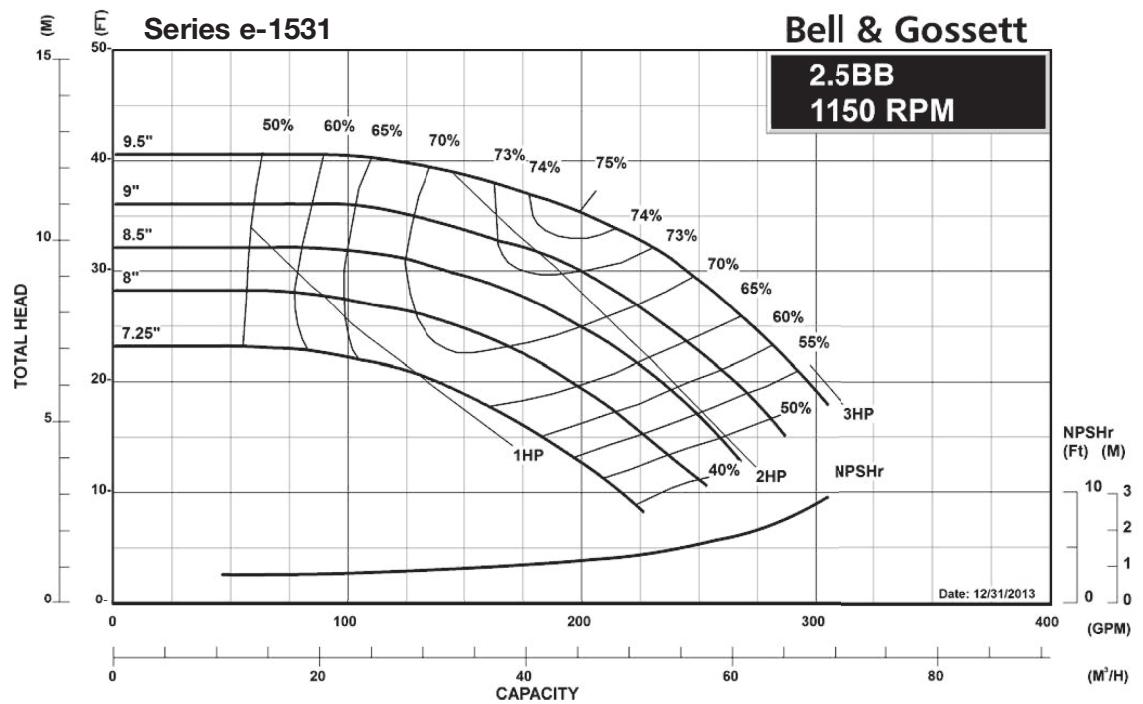
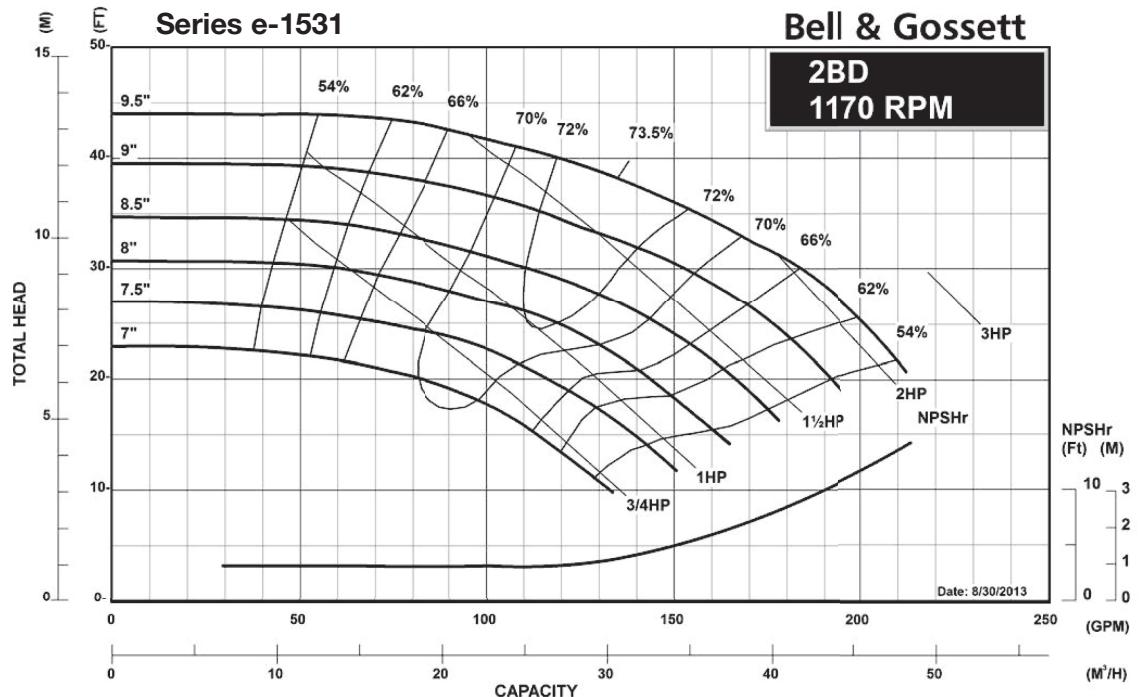
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1200 RPM SYNCHRONOUS SPEED



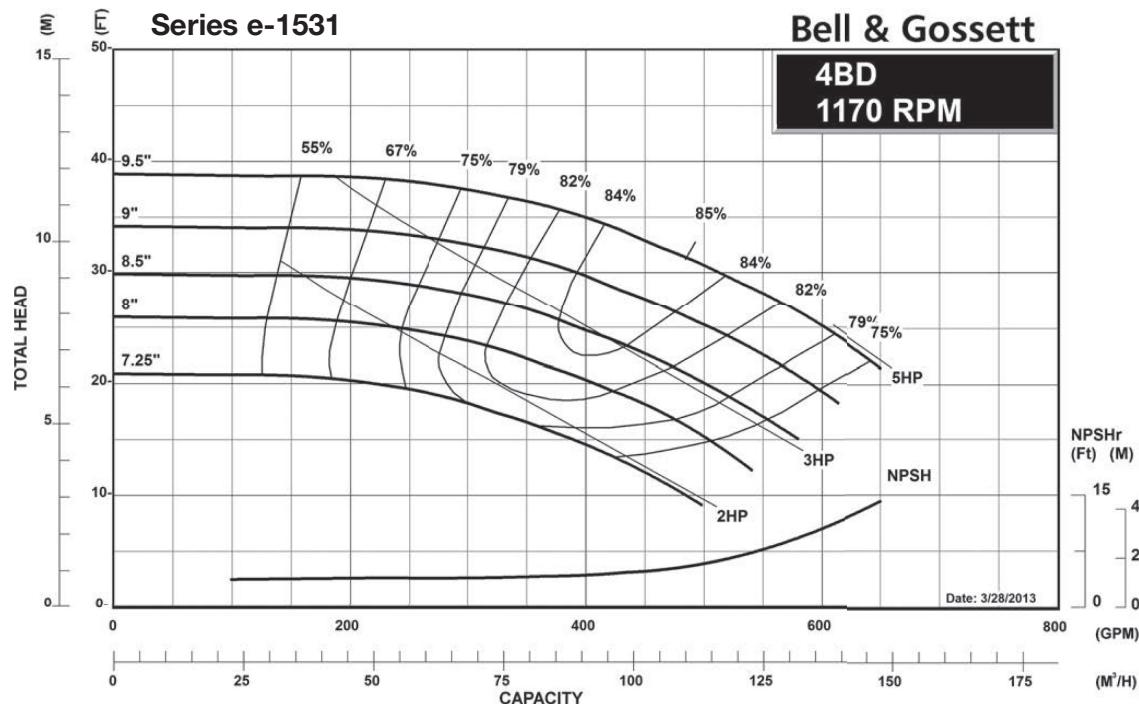
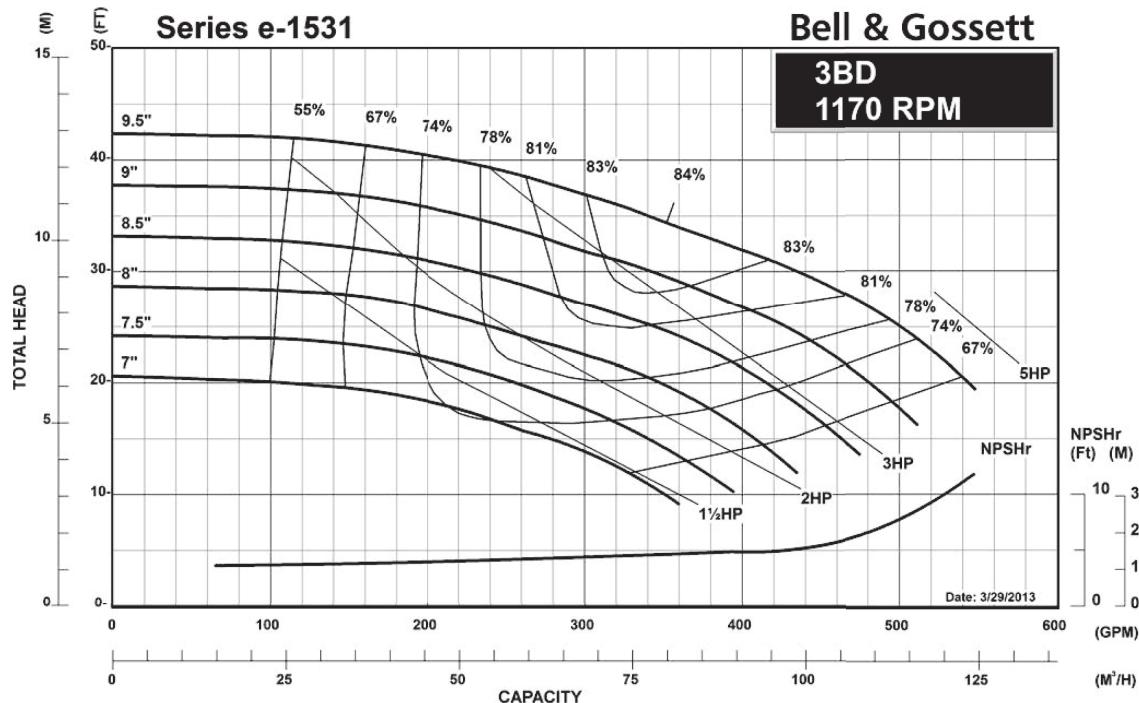
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1200 RPM SYNCHRONOUS SPEED



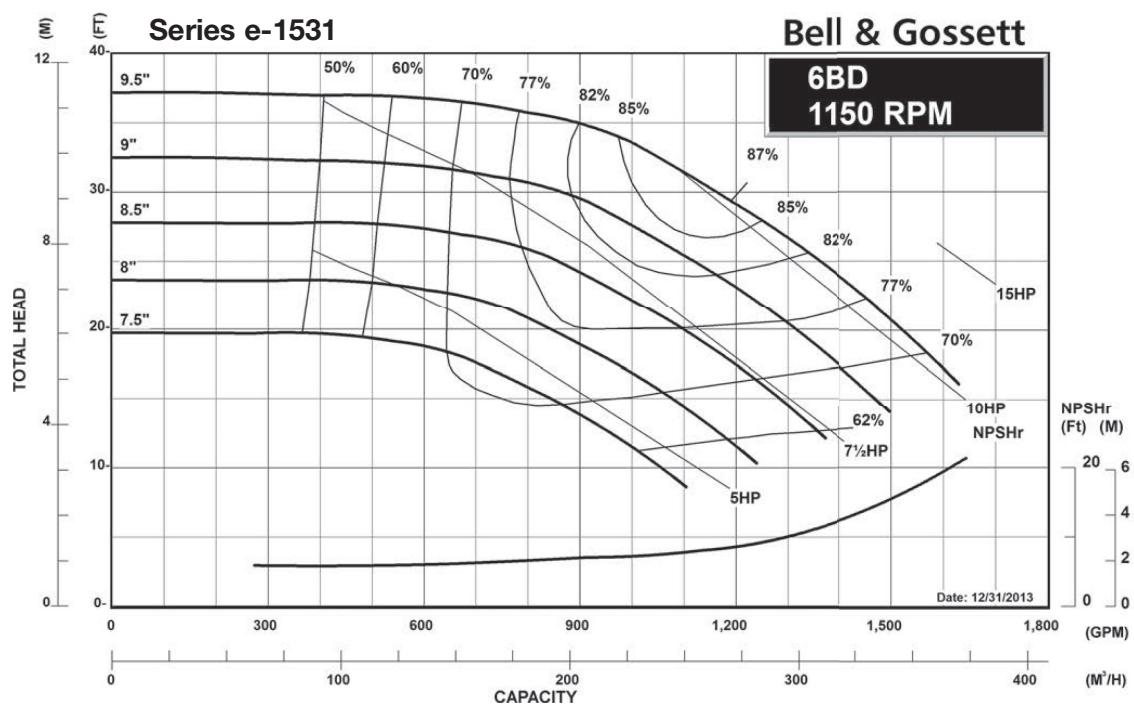
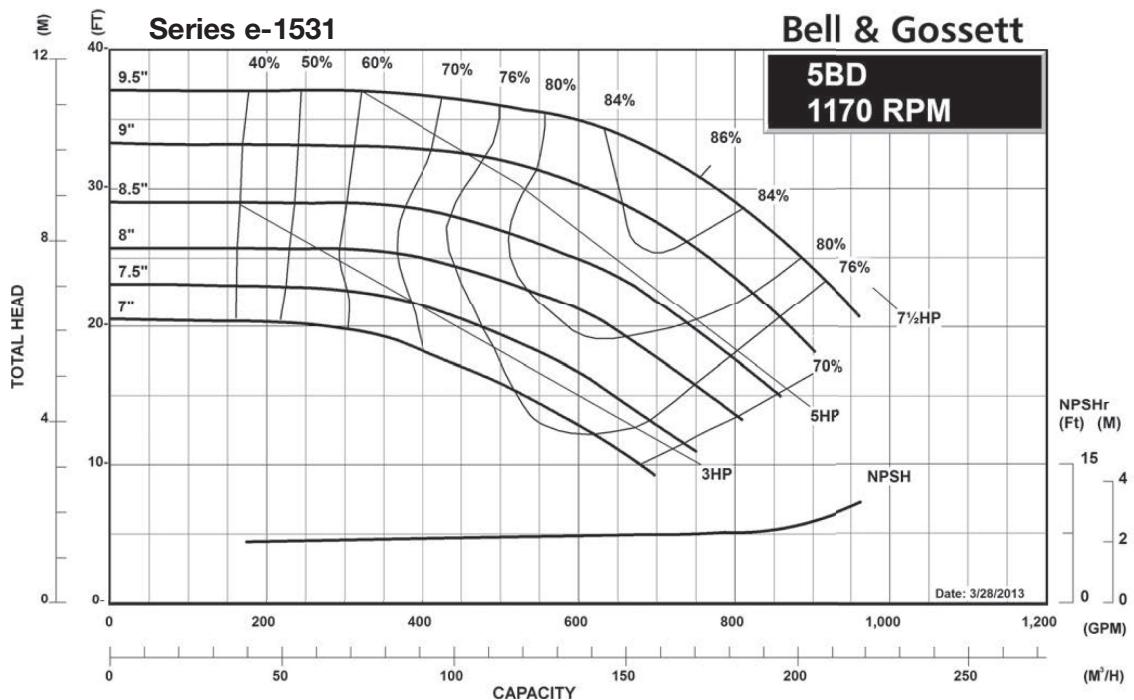
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1200 RPM SYNCHRONOUS SPEED



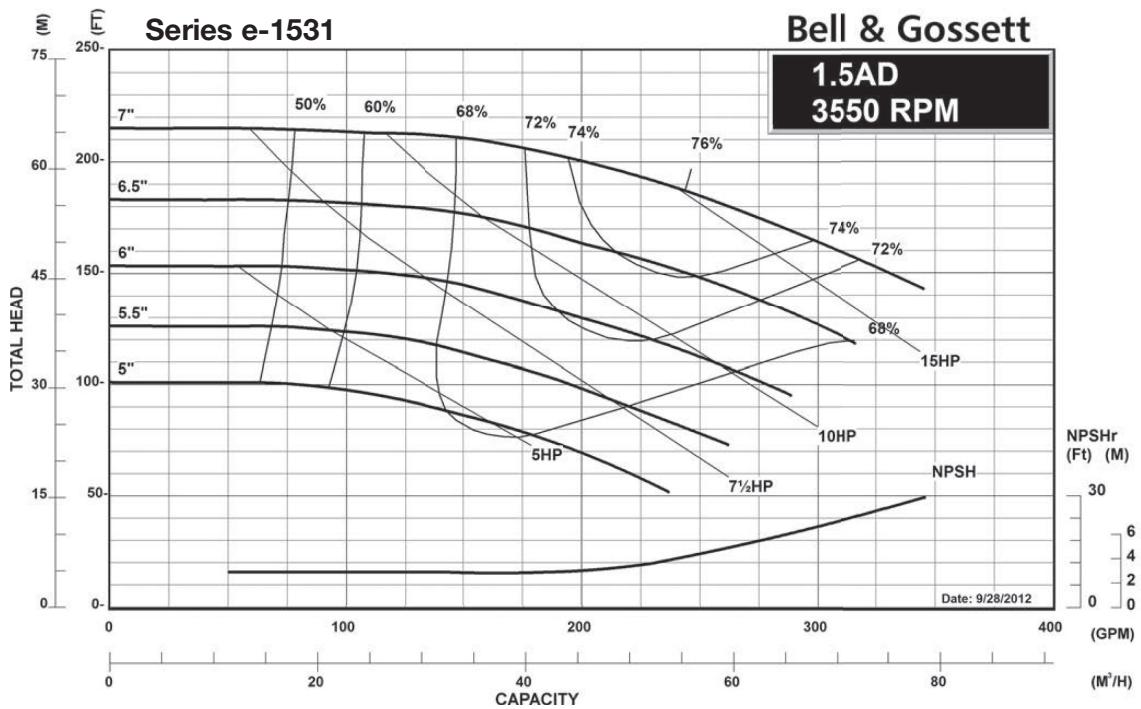
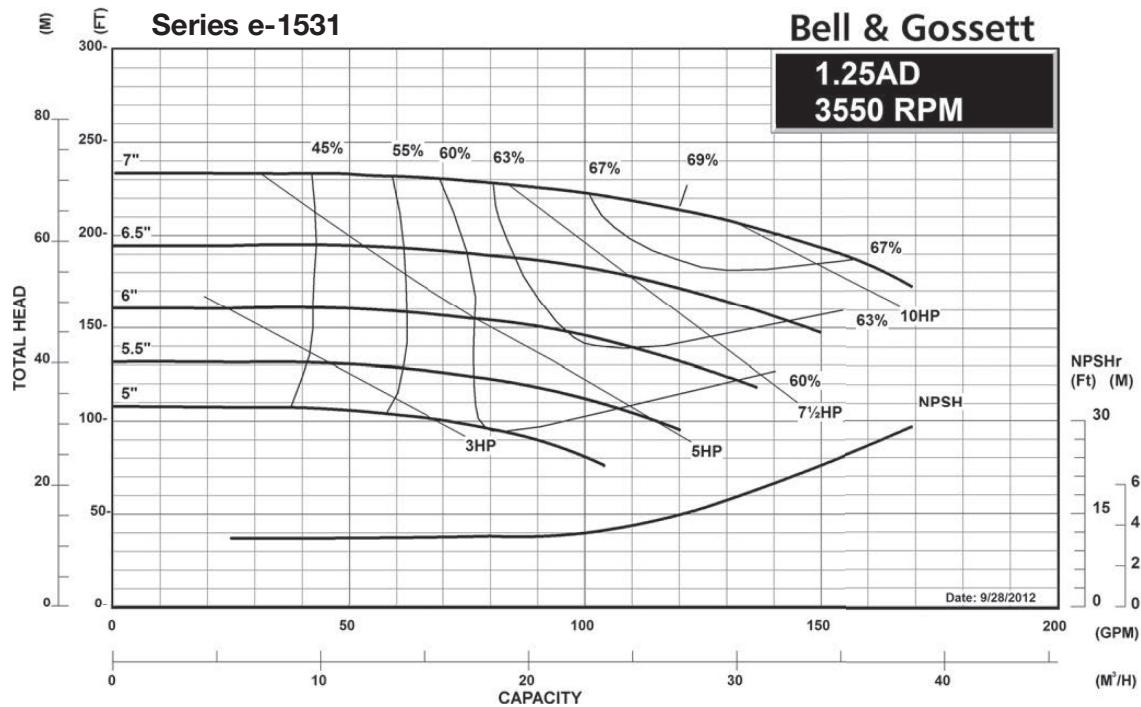
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1200 RPM SYNCHRONOUS SPEED



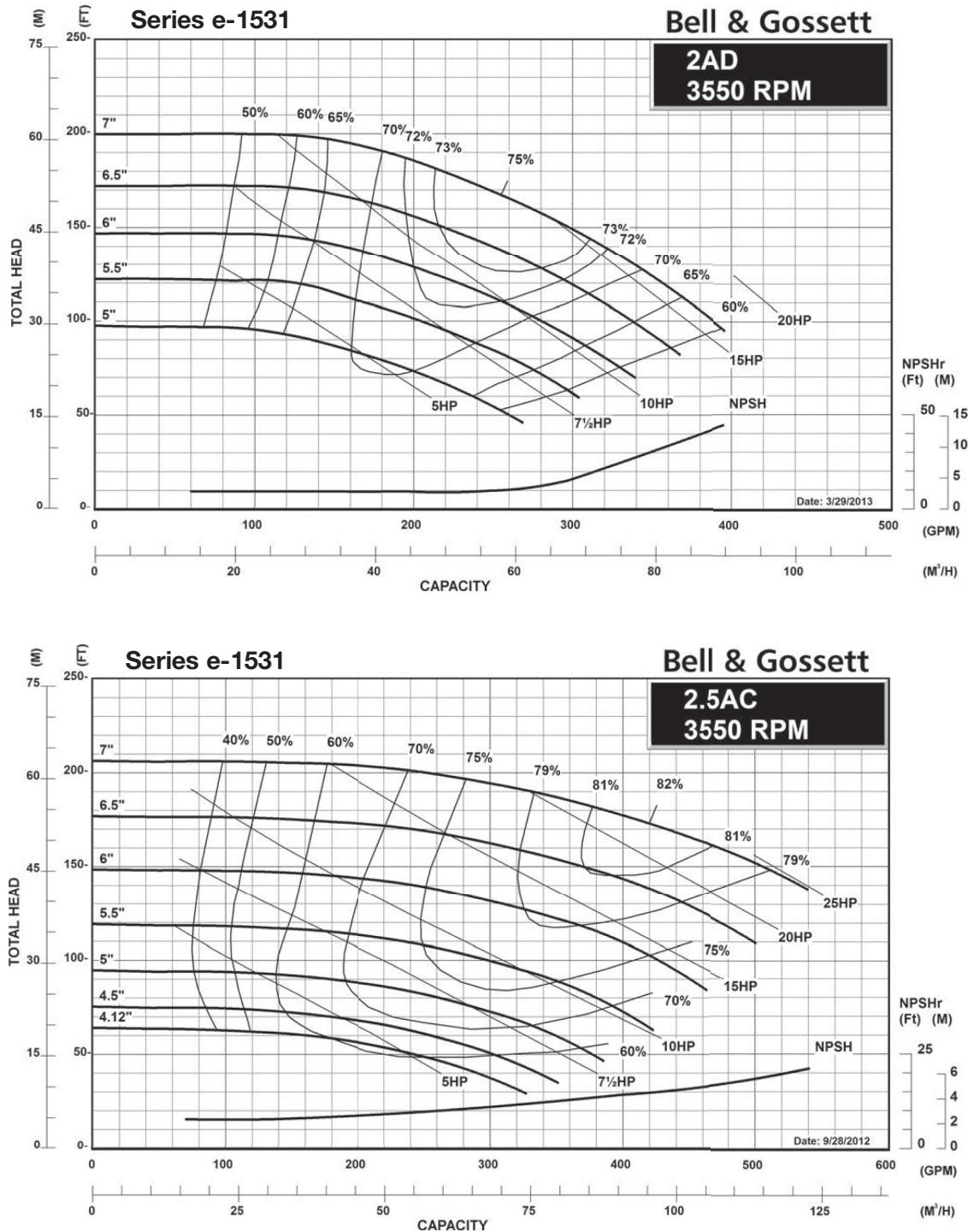
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3600 RPM SYNCHRONOUS SPEED



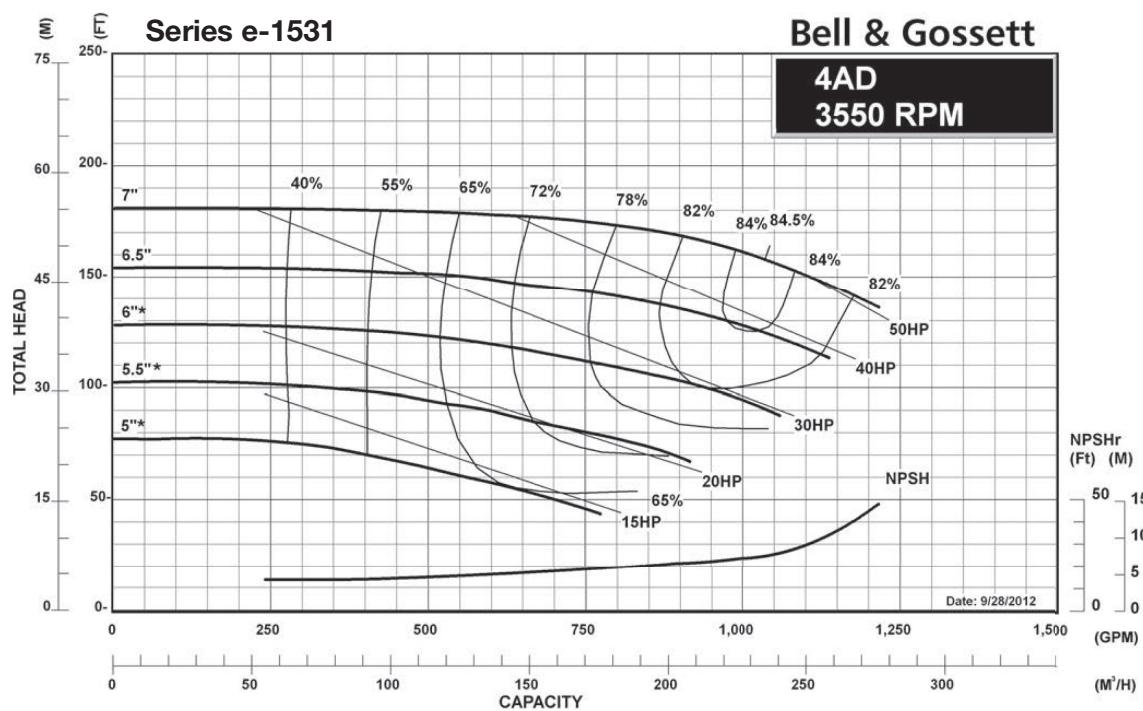
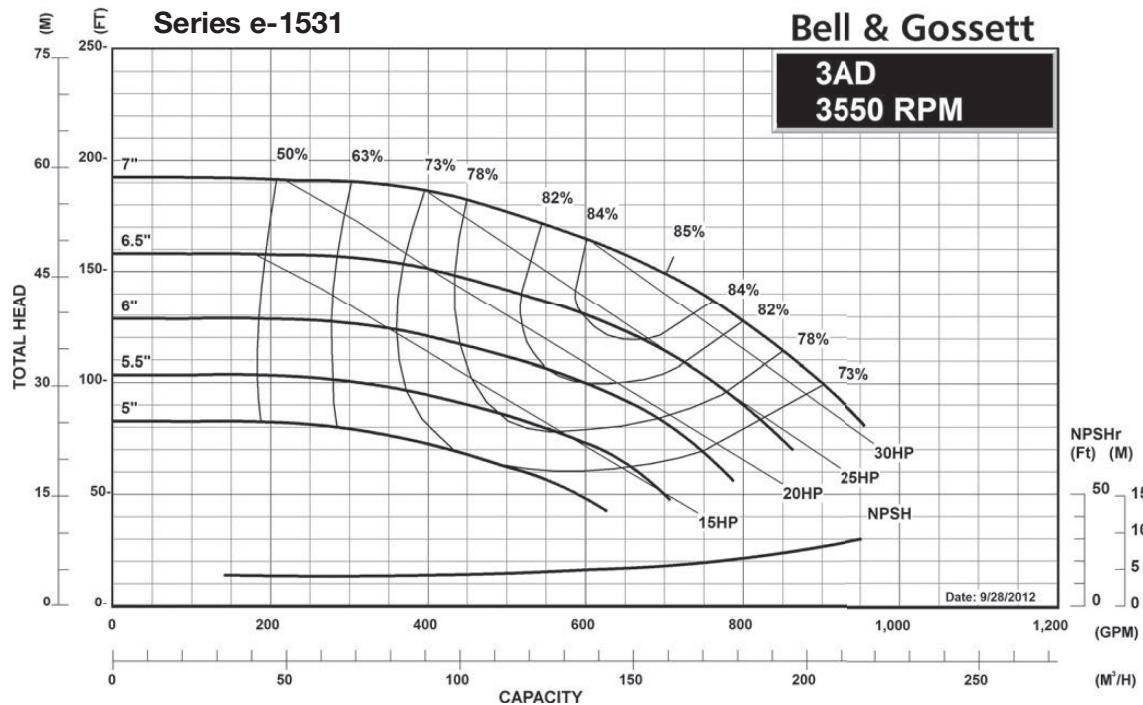
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3600 RPM SYNCHRONOUS SPEED



SERIES e-1531

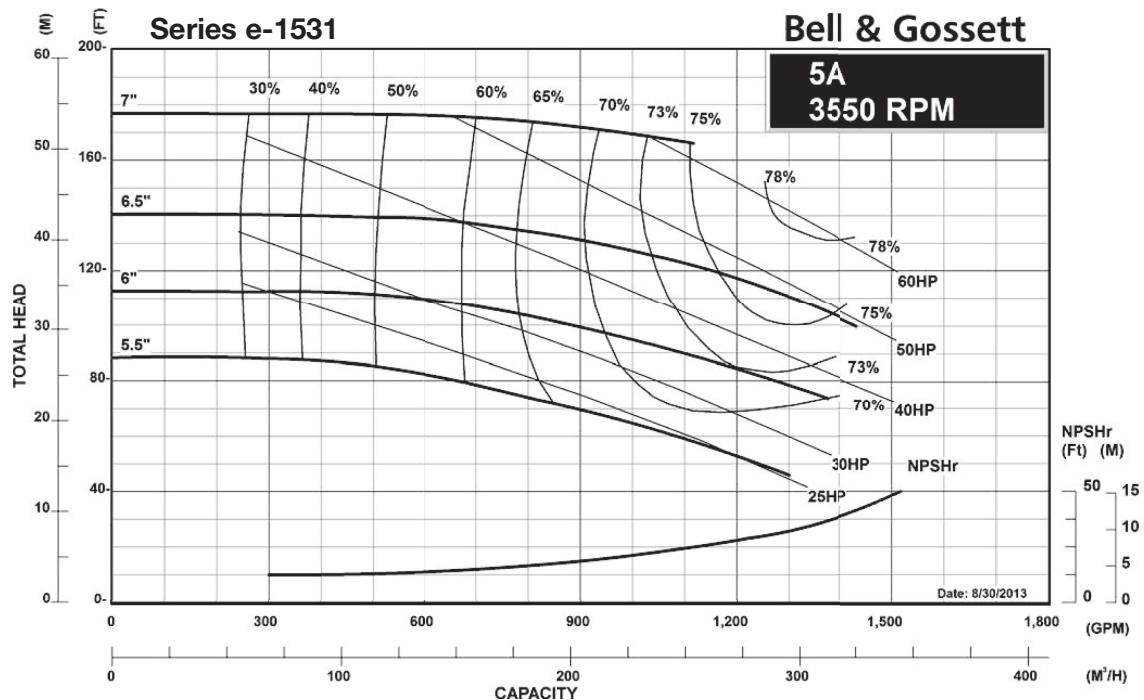
3600 RPM SYNCHRONOUS SPEED



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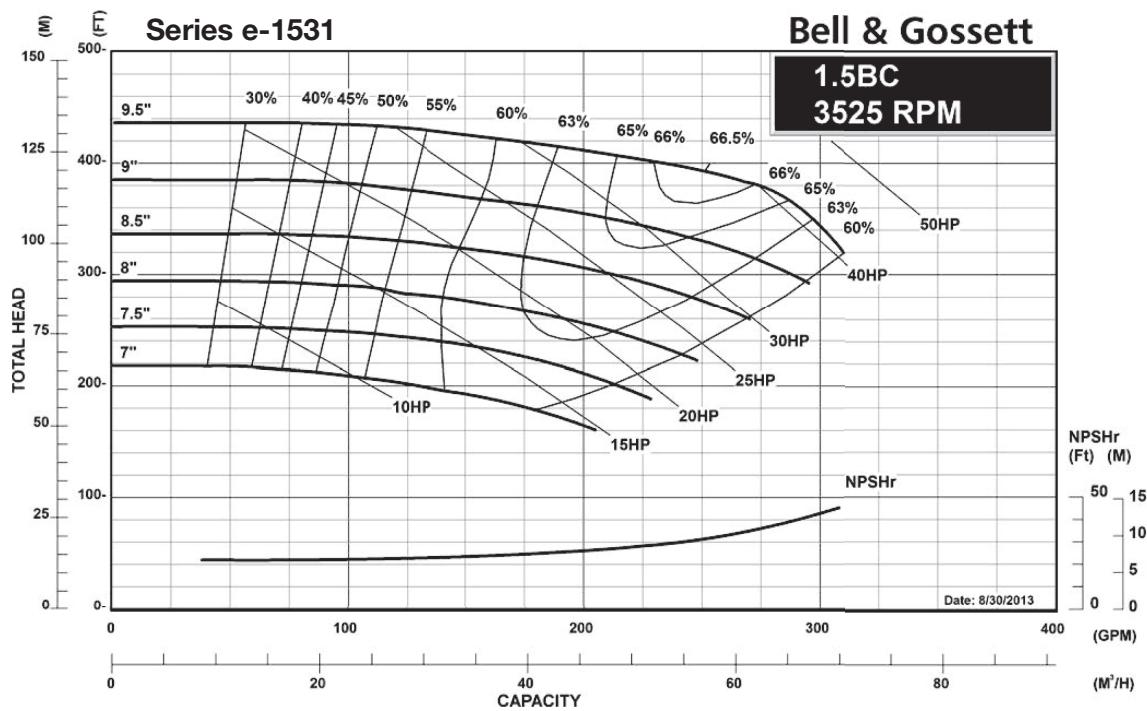
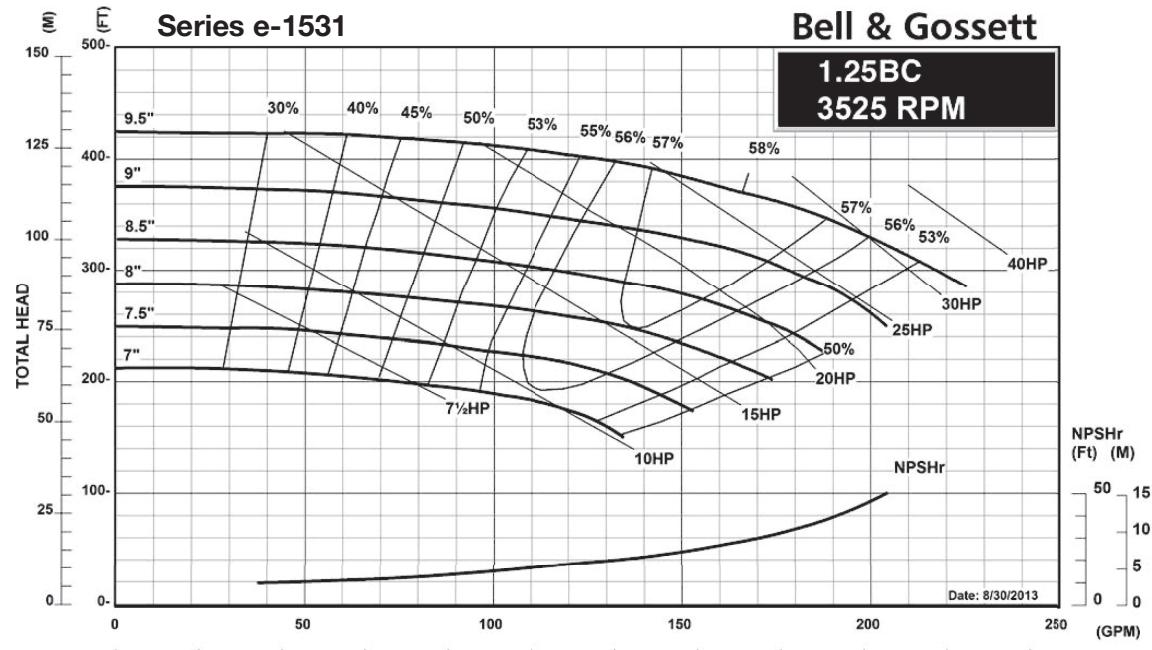
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3600 RPM SYNCHRONOUS SPEED



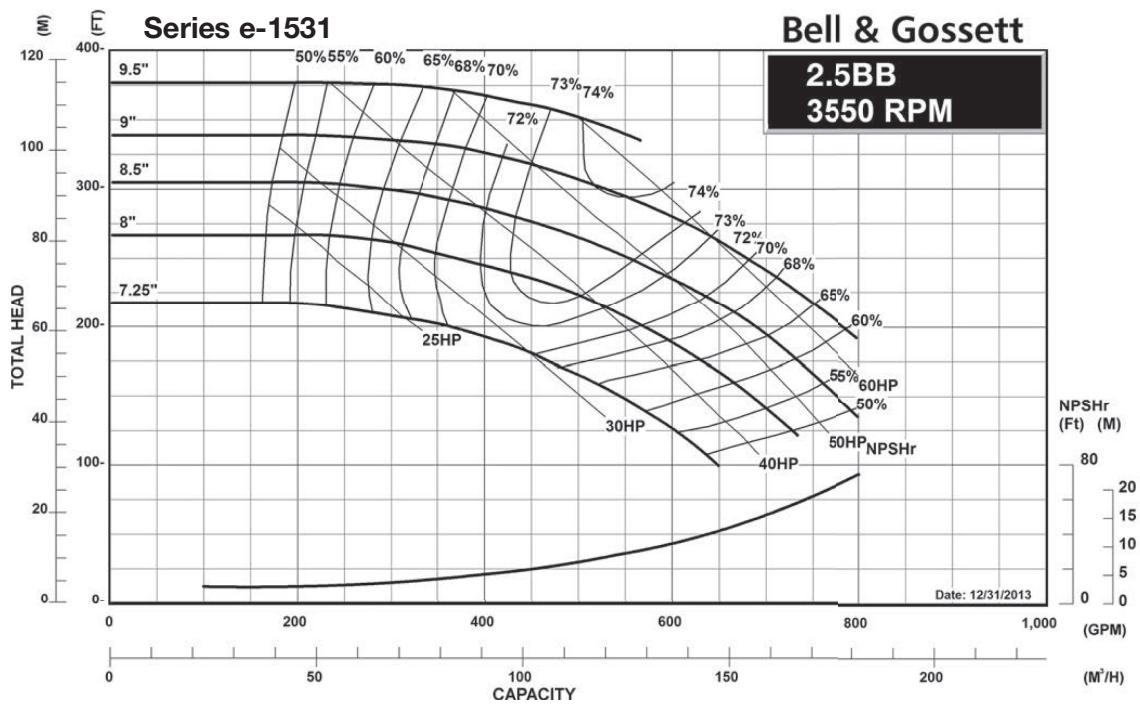
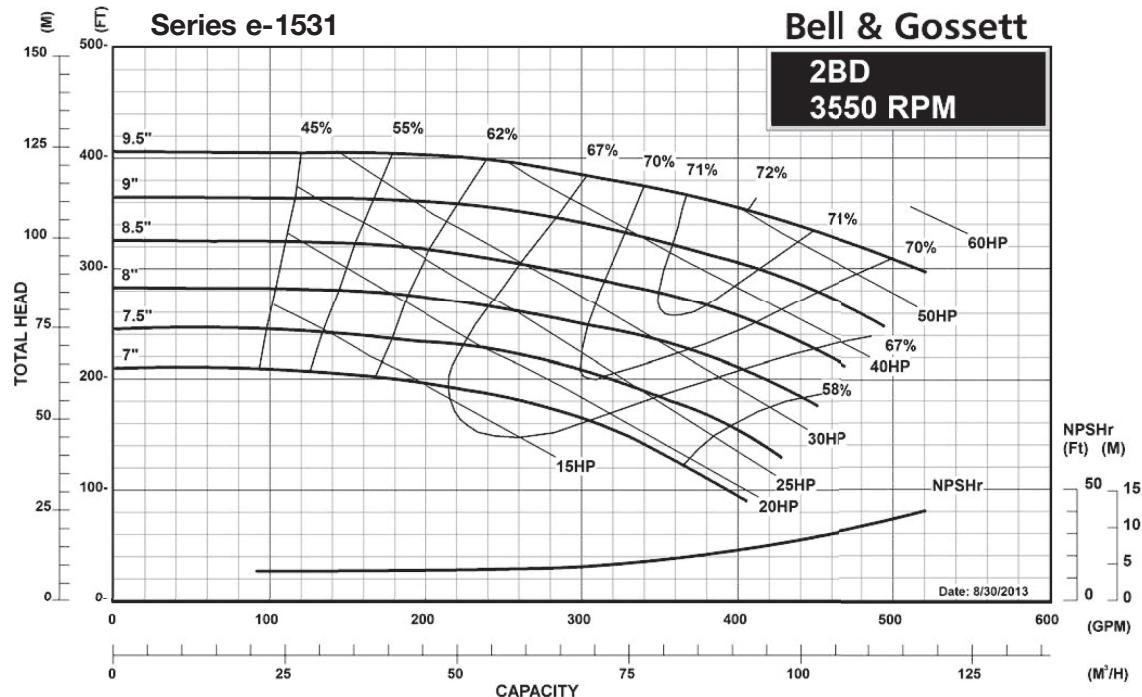
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3600 RPM SYNCHRONOUS SPEED



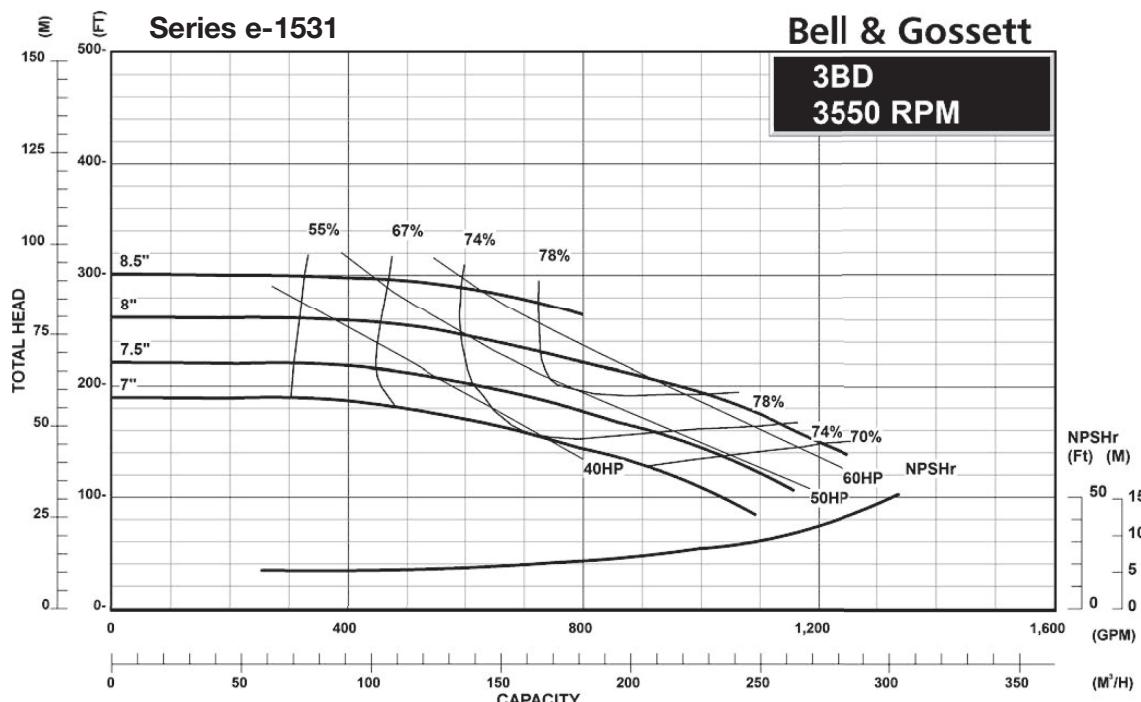
SERIES e-1531

3600 RPM SYNCHRONOUS SPEED



SERIES e-1531

3600 RPM SYNCHRONOUS SPEED



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- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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