

Company: Bonneville Power Administration  
 Name:  
 Date: 11/29/2006  
 Selection: Missing Fairbanks Vertical Turbines



**Pump:**

Size: 20HLC.1 (1 stage)  
 Type: VERT.TURBINE  
 Synch speed: 900 rpm  
 Curve:  
 Specific Speeds:  
 Dimensions:  
 Vertical Turbine:

Speed: 885 rpm  
 Dia: 13.2 in  
 Impeller:  
 Ns: ---  
 Nss: ---  
 Suction: 24 in  
 Discharge: --- in  
 Bowl size: 21.5 in  
 Max lateral: 0.44 in  
 Thrust K factor: 49 lb/ft

**Search Criteria:**

Flow: --- US gpm      Head: --- ft

**Fluid:**

Water  
 Density: 62.25 lb/ft<sup>3</sup>  
 Viscosity: 1.105 cP  
 NPSHa: --- ft

Temperature: 60 °F  
 Vapor pressure: 0.2563 psi a  
 Atm pressure: 14.7 psi a

**Motor:**

Standard: NEMA  
 Enclosure: TEFC  
 Sizing criteria: Max Power on Design Curve

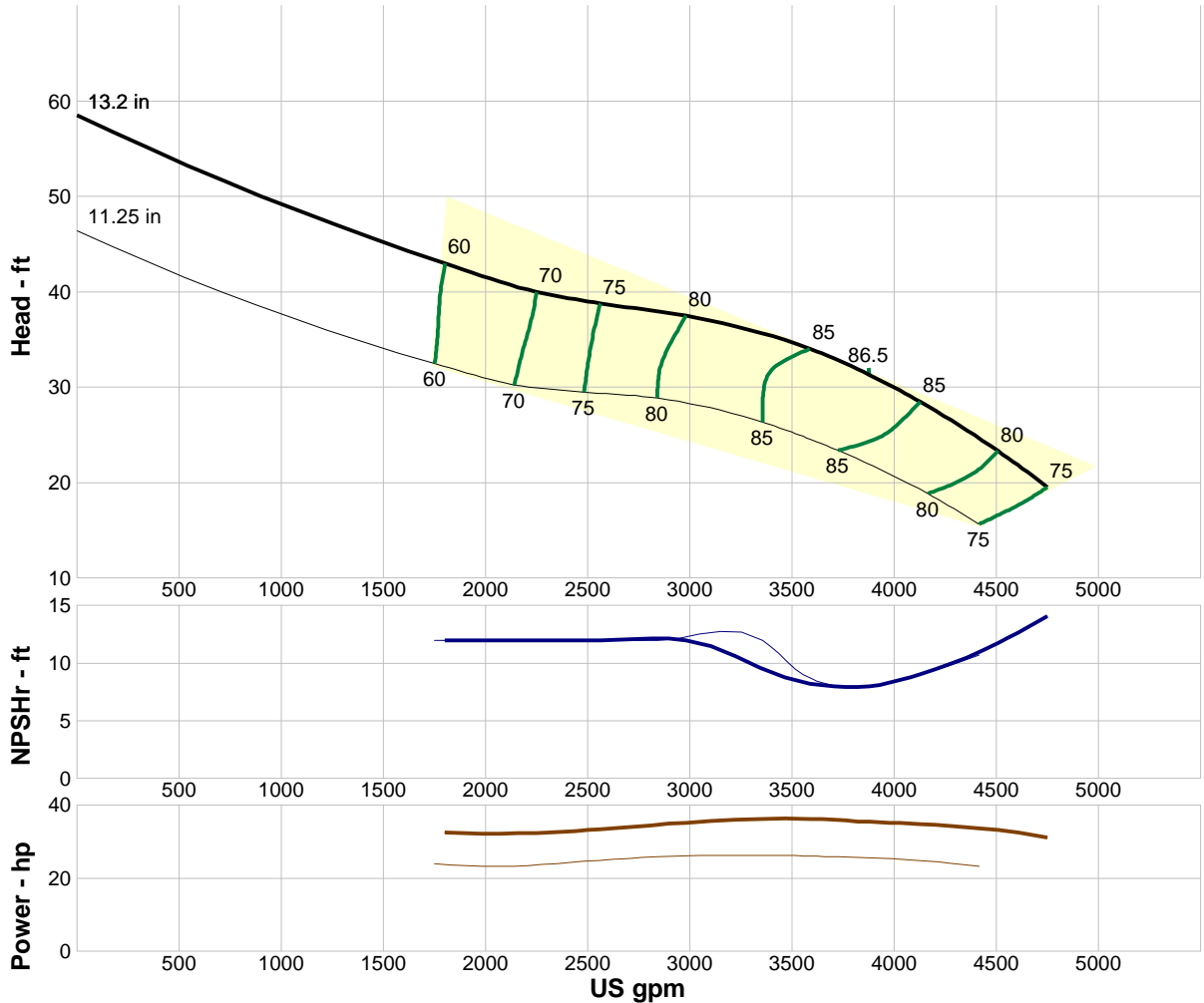
Size: 40 hp  
 Speed: 900  
 Frame: 365T

**Pump Limits:**

Temperature: 150 °F  
 Pressure: --- psi g  
 Sphere size: --- in

Power: 388 hp  
 Eye area: --- in<sup>2</sup>

---- Data Point ----	
Flow:	3878 US gpm
Head:	31.3 ft
Eff:	86.5%
Power:	35.5 hp
NPSHr:	8.01 ft
---- Design Curve ----	
Shutoff head:	58.5 ft
Shutoff dP:	25.3 psi
Min flow:	--- US gpm
BEP:	86.5% @ 3878 US gpm
NOL power:	36.3 hp @ 3587 US gpm
-- Max Curve --	
Max power:	36.3 hp @ 3587 US gpm



**Performance Evaluation:**

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
4559	885	22.5	78.9	32.8	12.2
3799	885	32.1	86.1	35.7	8.06
3039	885	37.2	80.5	35.4	11.6
2279	885	39.9	70.5	32.5	12
1520	885	---	---	---	---

Company: Bonneville Power Administration  
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**Pump:**

Size: 20HLC.2 (2 stage)  
 Type: VERT.TURBINE  
 Synch speed: 900 rpm  
 Curve:  
 Specific Speeds:  
 Dimensions:  
 Vertical Turbine:

Speed: 885 rpm  
 Dia: 13.2 in  
 Impeller:  
 Ns: ---  
 Nss: ---  
 Suction: 24 in  
 Discharge: --- in  
 Bowl size: 21.5 in  
 Max lateral: 0.44 in  
 Thrust K factor: 49 lb/ft

**Search Criteria:**

Flow: --- US gpm      Head: --- ft

**Fluid:**

Water  
 Density: 62.25 lb/ft<sup>3</sup>  
 Viscosity: 1.105 cP  
 NPSHa: --- ft

Temperature: 60 °F  
 Vapor pressure: 0.2563 psi a  
 Atm pressure: 14.7 psi a

**Motor:**

Standard: NEMA  
 Enclosure: TEFC  
 Sizing criteria: Max Power on Design Curve

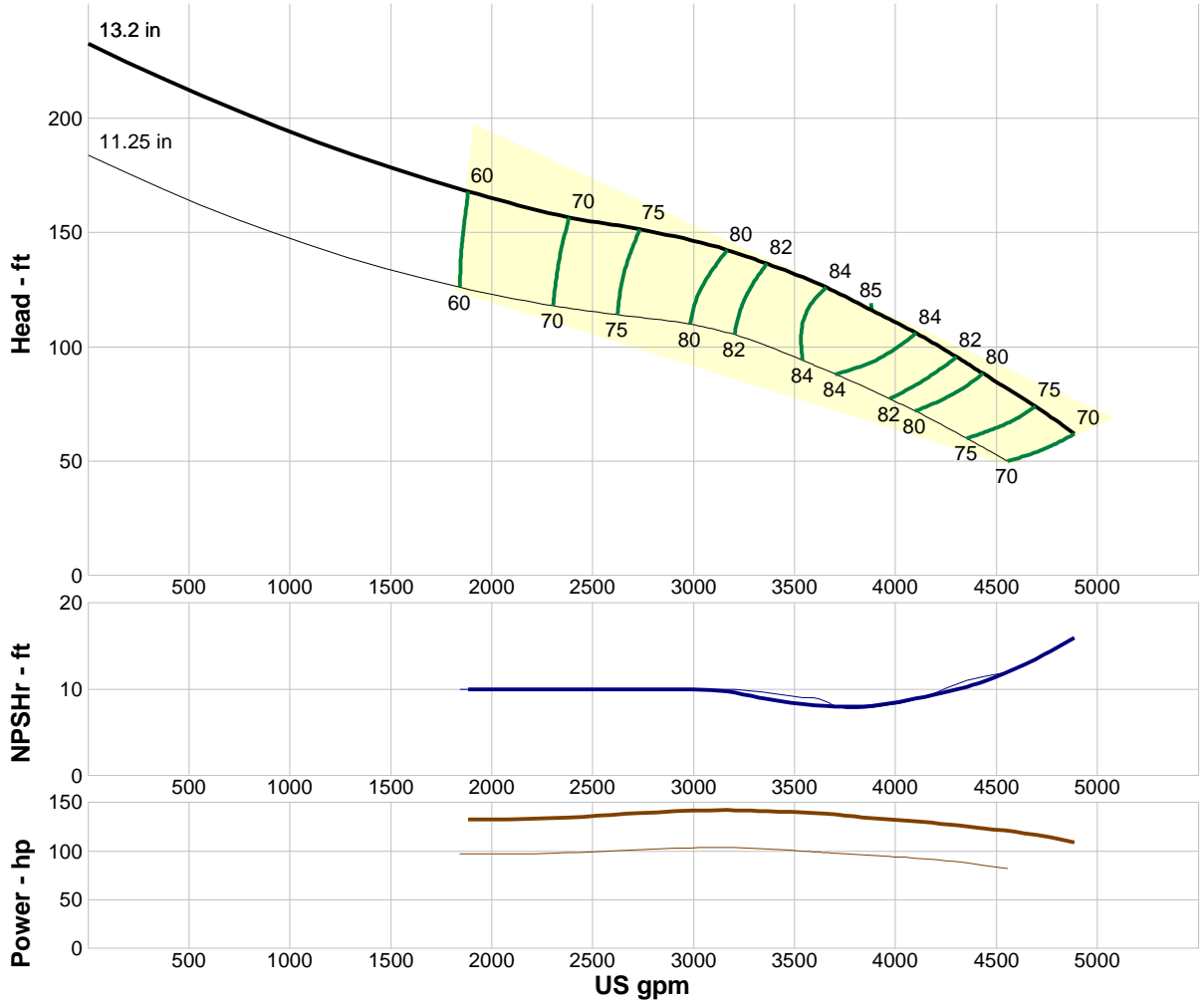
Size: 150 hp  
 Speed: 900  
 Frame: 449T

**Pump Limits:**

Temperature: 150 °F  
 Pressure: --- psi g  
 Sphere size: --- in

Power: 388 hp  
 Eye area: --- in<sup>2</sup>

---- Data Point ----	
Flow:	3880 US gpm
Head:	116 ft
Eff:	85%
Power:	134 hp
NPSHr:	8.1 ft
---- Design Curve ----	
Shutoff head:	233 ft
Shutoff dP:	101 psi
Min flow:	--- US gpm
BEP:	85% @ 3880 US gpm
NOL power:	142 hp @ 3163 US gpm
-- Max Curve --	
Max power:	142 hp @ 3163 US gpm



**Performance Evaluation:**

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
4688	885	74.1	75	117	13.5
3907	885	115	84.9	133	8.2
3126	885	143	79.6	142	9.77
2344	885	157	69.3	134	10
1563	885	---	---	---	---