

Company: Bonneville Power Administration

Name:

Date: 11/29/2006

Selection: Missing Fairbanks Vertical Turbines

**Pump:**

Size: 23HLC.1 (1 stage)

Type: VERT.TURBINE
Synch speed: 1200 rpm

Curve:

Specific Speeds:

Dimensions:

Vertical Turbine:

Speed: 1185 rpm
Dia: 13.26 in

Impeller:

Ns: ---
Nss: ---Suction: 29 in
Discharge: 24 inBowl size: 23 in
Max lateral: 0.88 in
Thrust K factor: 69 lb/ft**Pump Limits:**Temperature: 150 °F
Pressure: --- psi g
Sphere size: 1.91 inPower: 689 hp
Eye area: --- in²**Search Criteria:**

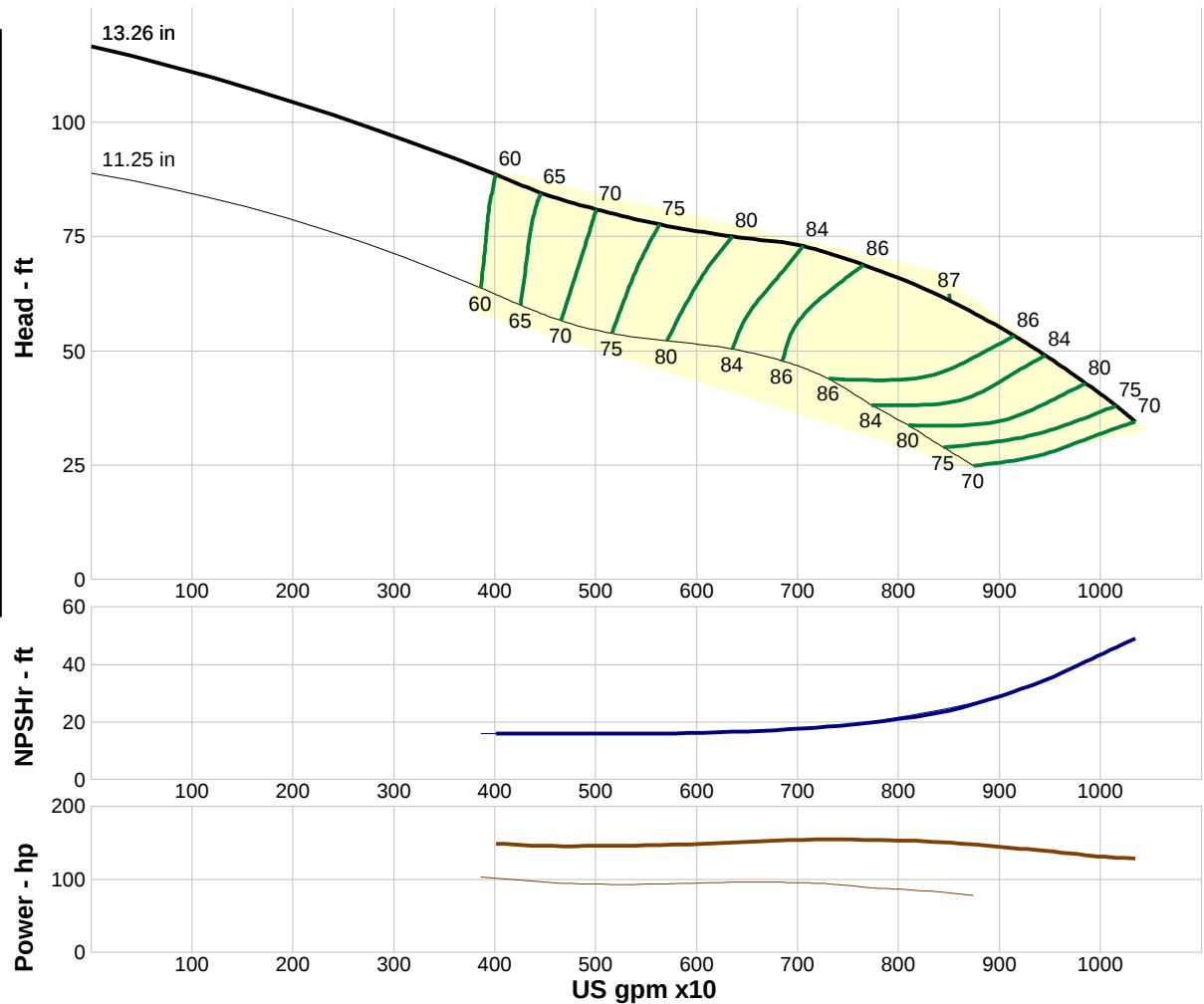
Flow: --- US gpm

Head: --- ft

Fluid:Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP
NPSHa: --- ftTemperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a**Motor:**Standard: NEMA
Enclosure: TEFCSize: 200 hp
Speed: 1200
Frame: 447T

Sizing criteria: Max Power on Design Curve

---- Data Point ----	
Flow:	8500 US gpm
Head:	61 ft
Eff:	87%
Power:	150 hp
NPSHr:	24.1 ft
---- Design Curve ----	
Shutoff head:	117 ft
Shutoff dP:	50.4 psi
Min flow:	--- US gpm
BEP:	87% @ 8500 US gpm
NOL power:	155 hp @ 7650 US gpm
-- Max Curve --	
Max power:	155 hp @ 7650 US gpm

**Performance Evaluation:**

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
9926	1185	41.7	78.7	132	42.3
8272	1185	63.1	86.7	152	22.9
6618	1185	74.2	81.5	152	17.1
4963	1185	81.2	69.7	146	16
3309	1185	---	---	---	---

Company: Bonneville Power Administration

Name:

Date: 11/29/2006

Selection: Missing Fairbanks Vertical Turbines



Pump:

Size: 23HLC.2 (2 stage)
 Type: VERT.TURBINE
 Synch speed: 1200 rpm
 Curve:
 Specific Speeds:
 Dimensions:
 Vertical Turbine:
 Speed: 1185 rpm
 Dia: 13.26 in
 Impeller:
 Ns: ---
 Nss: ---
 Suction: 29 in
 Discharge: 24 in
 Bowl size: 23 in
 Max lateral: 0.88 in
 Thrust K factor: 69 lb/ft

Search Criteria:

Flow: --- US gpm Head: --- ft

Fluid:

Water
 Density: 62.25 lb/ft³
 Viscosity: 1.105 cP
 NPSHa: --- ft
 Temperature: 60 °F
 Vapor pressure: 0.2563 psi a
 Atm pressure: 14.7 psi a

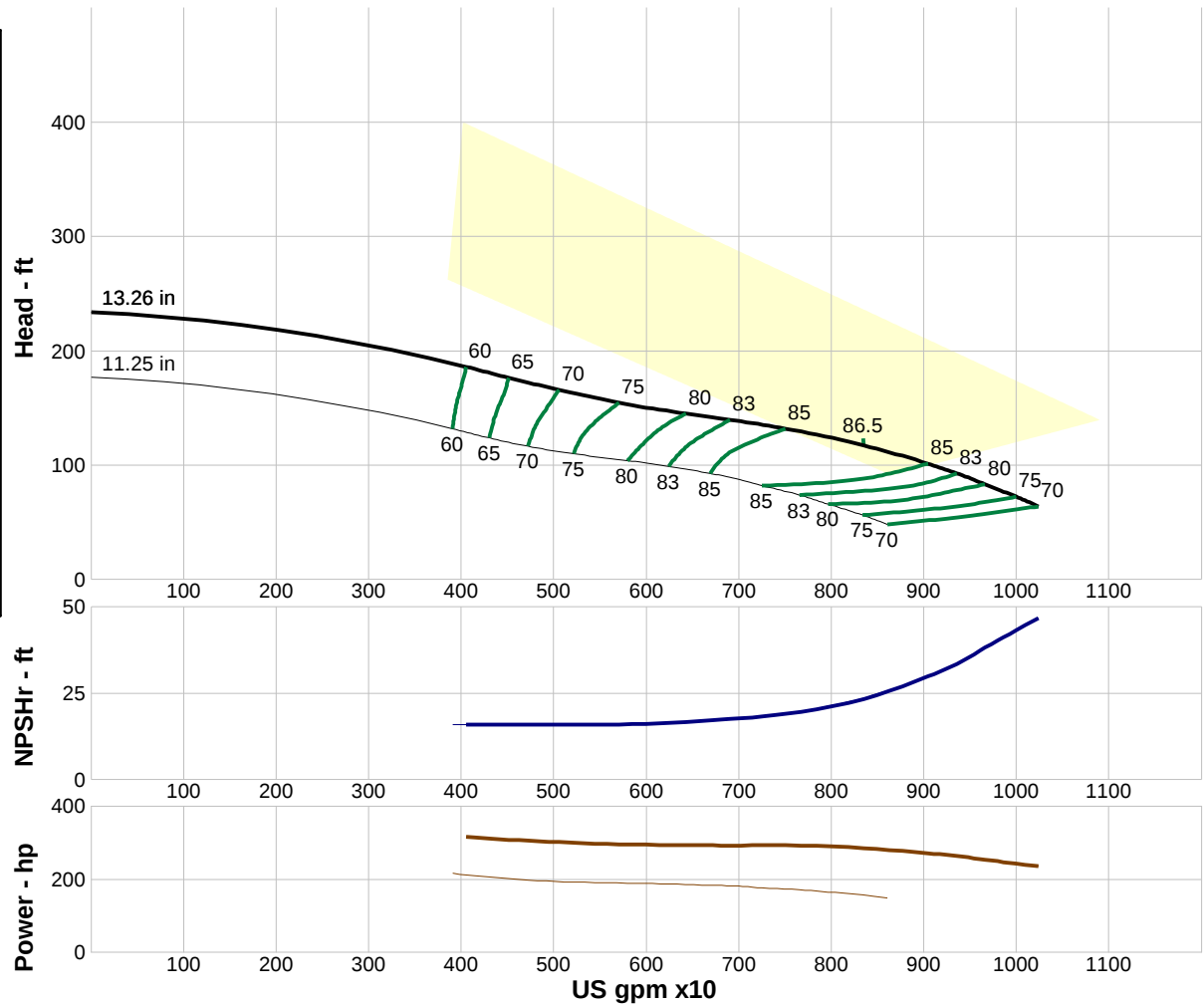
Motor:

Standard: NEMA
 Enclosure: TEFC
 Sizing criteria: Max Power on Design Curve
 --- hp
 Speed: ---
 Frame: ---

Pump Limits:

Temperature: 150 °F
 Pressure: --- psi g
 Sphere size: 1.91 in
 Power: 689 hp
 Eye area: --- in²

---- Data Point ----	
Flow:	8347 US gpm
Head:	117 ft
Eff:	86.5%
Power:	286 hp
NPSHr:	23.4 ft
---- Design Curve ----	
Shutoff head:	234 ft
Shutoff dP:	101 psi
Min flow:	--- US gpm
BEP:	86.5% @ 8347 US gpm
NOL power:	320 hp @ 3857 US gpm
-- Max Curve --	
Max power:	320 hp @ 3857 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
9826	1185	77.8	77.5	249	40.8
8188	1185	120	86.2	287	22.6
6550	1185	144	80.8	294	16.9
4913	1185	169	68.7	304	16
3275	1185	---	---	---	---