NOTE: Enter your data in yellow cells and results in blue cells will automatically update.

PUMP LAWS

Notes:

Water Density is constant, Specific Gravity of Water is 1, Pump Size is the same.

1 = Existing Condition; 2 = New Condition

New BHP

New BHP From Change in GPM

$$BHP_2 = \left(\frac{GPM_2}{GPM_1}\right)^3 \times BHP_1$$

GPM_1	10,000
BHP_1	10.00
GPM_2	7,000
BHP_2 =	3.43

New BHP From Change in RPM

$$BHP_2 = \left(\frac{RPM_2}{RPM_1}\right)^3 \times BHP_1$$

RPM_1	850
BHP_1	10.00
RPM_2	800
BHP_2 =	8.34

New BHP From Change in HD

$$BHP_2 = \left(\frac{HD_2}{HD_1}\right)^{1.5} \times BHP_1$$

HD_1	2.40
BHP_1	10.00
HD_2	2.00
BHP_2 =	7.61

New GPM

New GPM From Change in BHP

$$GPM_2 = \sqrt[3]{\frac{BHP_2}{BHP_1}} \times GPM_1$$

BHP_1	10.00
GPM_1	10,000.00
BHP_2	3.43
GPM_2 =	7,000

New GPM From Change in RPM

$$GPM_2 = \frac{RPM_2}{RPM_1} \times GPM_1$$

RPM_1	850
GPM_1	10,000
RPM_2	680
GPM_2 =	8,000

New GPM From Change in HD

$$GPM_2 = \sqrt{\frac{HD_2}{HD_1}} \times GPM_1$$

HD_1	2.40
GPM_1	10,000
HD_2	1.54
GPM_2 =	8,010

New RPM

New RPM From Change in BHP

$$RPM_2 = \sqrt[3]{\frac{BHP_2}{BHP_1}} \times RPM_1$$

BHP_1	10.00
RPM_1	850
BHP_2	8.34
RPM_2 =	800

New RPM From Change in HD

$$RPM_2 = \sqrt{\frac{HD_2}{HD_1}} \times RPM_1$$

HD_1	2.40
RPM_1	850
HD_2	2.13
RPM_2 =	801

New RPM From Change in GPM

$$RPM_2 = \frac{GPM_2}{GPM_1} \times RPM_1$$

GPM_1	10,000
RPM_1	850
GPM_2	8,000
RPM_2 =	680

New HD

New HD From Change in GPM

$$HD_2 = \left(\frac{GPM_2}{GPM_1}\right)^2 \times HD_1$$

GPM_1	10,000
HD_1	2.40
GPM_2	8,000
HD_2 =	1.54

New HD From Change in RPM

$$HD_2 = \left(\frac{RPM_2}{RPM_1}\right)^2 \times HD_1$$

RPM_1	850
HD_1	2.40
RPM_2	800
HD_2 =	2.13

New HD From Change in BHP

$$HD_2 = \sqrt[1.5]{\frac{BHP_2}{BHP_1}} \times HD_1$$

BHP_1	10.00
HD_1	2.40
BHP_2	8
HD_2 =	2.00