

ALLOWANCES FOR FRICTION LOSS INTAKE HOSE			
RATED CAPACITY OF THE PUMP IN GPM	DIAMETER OF THE INTAKE HOSE IN INCHES	FOR EVERY 10' OF INTAKE HOSE	ALLOWANCE IN FEET FOR EACH ADDITIONAL 10' OF INTAKE HOSE
500	4	6	Plus 1
	4 ½	3 ½	Plus ½
750	4	7	Plus 1 ½
	5	4 ½	Plus 1
1000	4 ½	12	Plus 2 ½
	5	4 ½	Plus 1 ½
	6	4	Plus ½
1250	5	12 ½	Plus 2
	6	6 ½	Plus ½
1500	5	4 ½	Plus 1
	6	9	Plus 1
1750	5	6 ½	Plus 1
	6	3	Plus ½
2000	5	8	Plus 1 ½
	6	4	Plus ½

FROM TABLE 12.2A IFSTA ADO-P CH. 12

DRAFTING GUIDELINES

It is important to know the difference in elevation between the pump and the water source when drafting water from a pond or stream. When drafting water, the air at atmospheric pressure is removed from the hose line, creating a vacuum (negative pressure) within the pump chamber. The atmospheric pressure (weight of air) on the water's surface forces the water up through the suction hose to the pump.

The maximum height to which an engine or pump can lift water is determined by the atmospheric pressure. At sea level, the atmosphere exerts an average pressure of 14.7 pounds per square inch (psi). Atmospheric pressure will vary due to changes in the weather. However, these changes tend to moderate themselves so that the average pressure will tend to go back toward 14.7 pounds per square inch. That is why it is safe to use this value of 14.7 pounds per square inch as a constant for calculations.

Maximum Lift: 14.7×2.304

Attainable Lift: Current Elevation $\times 2.304$

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COMPUTING NET ENGINE PRESSURE WHEN DRAFTING

$$\text{NEP} = \text{Suction Side Work} + \text{Discharge Side Work}$$

- Work performed on the discharge side of the pump is indicated on the pump's discharge gauge
- Work performed on the suction side of the pump is determined by computing the following formula:

$$\text{Work (psi)} = \frac{\text{Lift (in feet)} + \text{Intake Hose Friction Loss (psi)}}{2.3 \text{ feet}}$$

Steps:

1. Determine the lift (*in feet*)
2. Determine the friction loss in the intake hose used
3. Add lift and friction loss together
4. Divide by 2.3 (2.3 is the amount of lift (*in feet*) that 1psi of water pressure will support)

EXAMPLE: A pumper is discharging 1000 GPM at a pressure of 142psi. The pumper is drafting water with a lift of 10 feet through 20 feet of 5" hard suction hose and strainer. What is the NEP?

$$\text{NEP} = \text{Suction Side Work} + \text{Discharge Side Work}$$

$$\text{SS Work} = \frac{10 \text{ feet} + 9.5\text{psi}}{2.3 \text{ ft.}} = \frac{19.5 \text{ ft. psi}}{2.3 \text{ ft.}} = 8.47\text{psi}$$

$$\text{Discharge Side Work} = 142\text{psi}$$

$$\text{NEP} = 8.47\text{psi} + 142\text{psi}$$

$$\text{NEP} = 150\text{psi}$$