# APPLICATION AND TROUBLESHOOTING ASSISTANCE



***WE MAKE PUMP SELECTIONS EASY! Our team's years of pump and systems experience enables us to walk you through the labyrinth of application variables (see pages 138 and 139 for variables involved) and provide you with recommendations for the pump solution that best fits your performance, duty cycle, power source and budgetary needs.***

## Index



## RULES OF THUMB

***Elevation Affects Suction Lift!*** It is important to factor in elevation when applying a self-priming pump. See the chart on page 137.

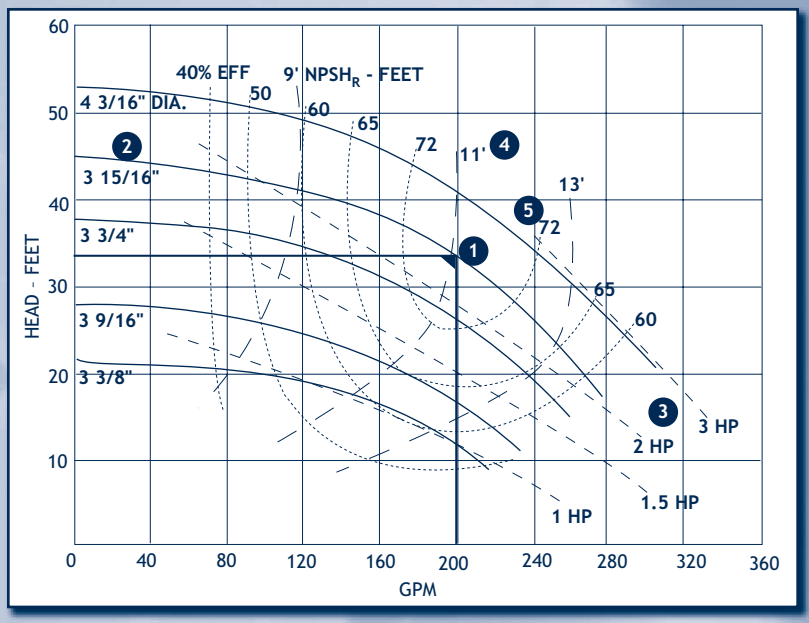
***Verify Pressure On All Closed Systems!*** Any closed system has the potential of developing internal system pressures that can cause pump failure. Always verify your system pressure throughout your operating temperature range (rising temperature expands liquids causing increased system pressure).

***Hose Friction Is Greater Than Pipe Friction Size For Size.*** Always be sure to use the appropriate friction loss chart when figuring line loss. Internal dimensions vary between like-sized hose and pipe which can drastically effect your systems required discharge pressure. See charts on page 137.

***PTO Drive Pumps Run Backwards!*** PTO driven pumps are designed to run in the opposite rotation. This is especially critical to rotation sensitive designs like centrifugals. When selecting a pump for PTO drive verify it is designed to run in your required rotation.

***Use Additional HP When Utilizing An Engine!*** Add a minimum of 15% to the required electric HP at comparable RPMs when determining the required engine HP.

## READING A CENTRIFUGAL PUMP CURVE




## Example: you require 200 gpm at 33 tdh

1. Identify the point on the curve that corresponds to your require-ments by intersecting the flow value on the bottom with the head value on the left.
2. Select the appropriate impeller diameter to meet your require-ments (in this example it is 3 $^{15}/_{16}$).
3. Evaluate your required break horsepower (here you need to inter-polate between the HP lines and round up the 2.4 BHP to 3 BHP). Remember to compensate for specific gravity (multiply your liquids SPG x BHP required in the chart).
4. Identify the NPSH (net positive suction head) required for your applications (11´) and make sure you have a comfortable margin of safety. *Rule of Thumb: always have in your system at least three extra feet of NPSH.*
5. Identify the efficiency of your pump selection (72%). Selecting the pump with the best efficiency will reduce your power consumption and often the size motor the pump will require to meet your performance.

## TYPES OF VISCOUS LIQUIDS

**Newtonian Fluids:** Viscosity remains constant with changing shear rates or agitation. The required force to create flow increases proportionally as speed increases (examples: water, mineral oils, syrups, hydrocarbons, resins).

**Thixotropic Fluids:** Viscosity decreases as the sheer rate increases (examples: paints, inks, caulking compounds, gels, slurry mixes, lotions, shampoo).

**Dilatant Fluids:** Viscosity increases as the sheer rate increases (examples: fluids with high concentration of clays, oxides and granular or crystalline materials).