

Priming, drafting and cavitation

Why a pump will not pull water, what cavitation sounds like, and the lift limits physics imposes no matter how good the pump is.

PROCEDURE

- 1 Cap and close everything**
All intakes capped, drains and bleeders shut. One open valve defeats the whole prime.
- 2 Run the primer until vacuum steadies**
Look for it to pull and hold, rather than climbing and falling back.
- 3 Vacuum test if it will not hold**
22 inHg, primer off, no more than 10 inHg lost in 10 minutes.
- 4 Listen while flowing**
Gravel noise plus erratic discharge that ignores the throttle means cavitation.
- 5 Reduce demand, do not add throttle**
Close a line or improve the supply. More RPM worsens cavitation and erodes the impeller.

NUMBERS

Theoretical lift	about 33 ft	at sea level with a perfect vacuum
Practical lift	about 20-25 ft	less at altitude
Dry vacuum test	22 inHg, lose 10 inHg or less in 10 min	NFPA 1911
Lift penalty	roughly 1 ft per 1,000 ft elevation	thinner air pushes less
Cavitation signature	gravel noise, pressure ignores RPM	stop and reduce demand

COMMON MISTAKES

- Adding throttle to fix cavitation, which only accelerates impeller erosion.
- Blaming the primer when the real fault is an open drain or a bad gasket.
- Expecting full lift at altitude.
- Running a dry pump long enough to cook the packing while troubleshooting.

Overhaul Prep · overhaulprep.app/learn/priming-and-cavitation · practice and prep material, not a substitute for the manufacturer's service information.