

Fire pump theory - what the panel is really telling you

Centrifugal pump behaviour, why pressure and flow trade against each other, and what the intake and discharge gauges mean together.

PROCEDURE

- 1 Note the static intake**
Before flowing, record intake pressure. That is the baseline for everything that follows.
- 2 Flow and watch both gauges**
Open a line and see which gauge moves. Discharge alone means the pump side; both means the supply side.
- 3 Match speed to demand**
Raise RPM to restore discharge pressure as lines open, and back it down as they close.
- 4 Respect the residual**
Do not let hydrant intake fall below roughly 20 psi residual - below that you are overdrawing the supply.
- 5 Confirm against the curve**
If the pump will not make rated pressure at rated flow, that is a service-test failure to document, not an operator problem.

NUMBERS

Rated capacity points	100% @ 150 psi - 70% @ 200 psi - 50% @ 250 psi	the standard service-test points
Minimum residual intake	about 20 psi	below this you are overdrawing the supply
Annual service test	NFPA 1911	pump, pressure control and gauges tested together
Typical pump ratings	750-2000 GPM	at 150 psi net pump pressure

COMMON MISTAKES

- Reading discharge pressure alone and assuming a pump fault when the supply is the real limit.
- Chasing rated flow and rated pressure at the same time - the curve does not allow both.
- Ignoring a falling residual on a hydrant and collapsing the supply.
- Blaming the pump for a governor or relief valve that is doing exactly what it was set to do.

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