

Kinds of fire pumps - how they're built, driven and engaged

Single-stage and two-stage, midship, front-mount and rear-mount, split-shaft and PTO-driven, pump-and-roll, priming pumps and separate-engine pumps: what each is and what changes when you service and test it.

PROCEDURE

1 Read the plate and the test label

Rated capacity and pressures, the pump maker and model, and the engine speed recorded at the last test.

2 Find the drive

A gearbox in the driveline behind the transmission is split-shaft. A pump driven off the transmission PTO, the front of the crankshaft or the flywheel is PTO-driven. Its own engine means a separate-engine pump.

3 Count the stages

A transfer valve control and a volume/pressure indicator on the panel mean a two-stage pump.

4 Find the primer

Electric rotary-vane, oil-lubricated or oil-free, or an exhaust primer on some smaller pumps. Note whether it has a lubricant tank to check.

5 Open the right manual

Shift procedures, drip rates, oil types and clearances all come from the pump and transmission makers' manuals.

NUMBERS

Fire pump (NFPA 1910)	250 to 2999 gpm at 150 psi; 3000+ gpm at 100 psi	net pump pressure (3.3.94)
Capacity test points	100% @ 150 psi, 70% @ 200, 50% @ 250	pumps under 3000 gpm; 20, 10 and 10 minutes (22.7.8.2.1)
Overload test	100% @ 165 psi for 5 min	pumps 750 to 2999 gpm, right after the 150 psi run
Two-stage test	100% parallel, 50% series	70% in either position (22.7.8.2.3)
Wildland and UHP pumps	30 min at rated capacity and pressure	22.7.8.1.1

COMMON MISTAKES

- Assuming every pump shifts the same way - split-shaft, PTO and pump-and-roll drives each have their own sequence and lights.
- Trying to pump and roll on a split-shaft pump.
- Running a two-stage pump in pressure (series) for a high flow.
- Leaving the primer running after the pump is primed.
- Testing a wildland or ultra-high-pressure pump to the 100/70/50 percent points meant for fire pumps.
- Engaging a standard PTO with the truck rolling - only a hot-shift PTO allows it.

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