



Tank to Pump Line Flow Tests

Strafford, New Hampshire
October 18, 2009

Overview

- On October 17th and 18th 2009, GBW Associates, LLC conducted a Rural Water Supply Operations Seminar hosted by the Strafford, New Hampshire Fire Rescue Department.
- Part of the seminar included a 2-hr tanker shuttle operation. During the seminar, discussion occurred about the ability to pump off water from an engine/tanker's onboard tank when the unit is being used in a nurse-tanker mode – some folks refer to this pumping arrangement as the “rural hitch”.
- One department in attendance wanted to know how fast they could pump off the water from their 2,500 gallon engine/tanker, so a couple of flow tests were conducted.
- The results of those flow tests are presented here.

The Participant: Alton Fire Rescue 1-Engine-2



1-Engine-2 is a 2004, E-One 2,000 gpm engine/tanker with a 2,500 gallon tank. It has both a 3-inch and a 4-inch tank to pump line. The unit carries 2,000 ft of 4-inch hose. has a 6-inch rear dump/fill, and is equipped with Class A foam.

The Participant



The Process

- Two flow tests were conducted – one using the 3-inch tank to pump line and one using the 4-inch tank to pump line.
- The engine/tanker's pre-piped deck gun was used to flow water and was equipped with a 2-inch smooth bore nozzle.
- A hand held pitot tube was used to obtain a pressure reading at the discharge opening of the nozzle.
- That pressure reading was then used in Freeman's formula to calculate the flow rate and thus, the flow rate from the tank.

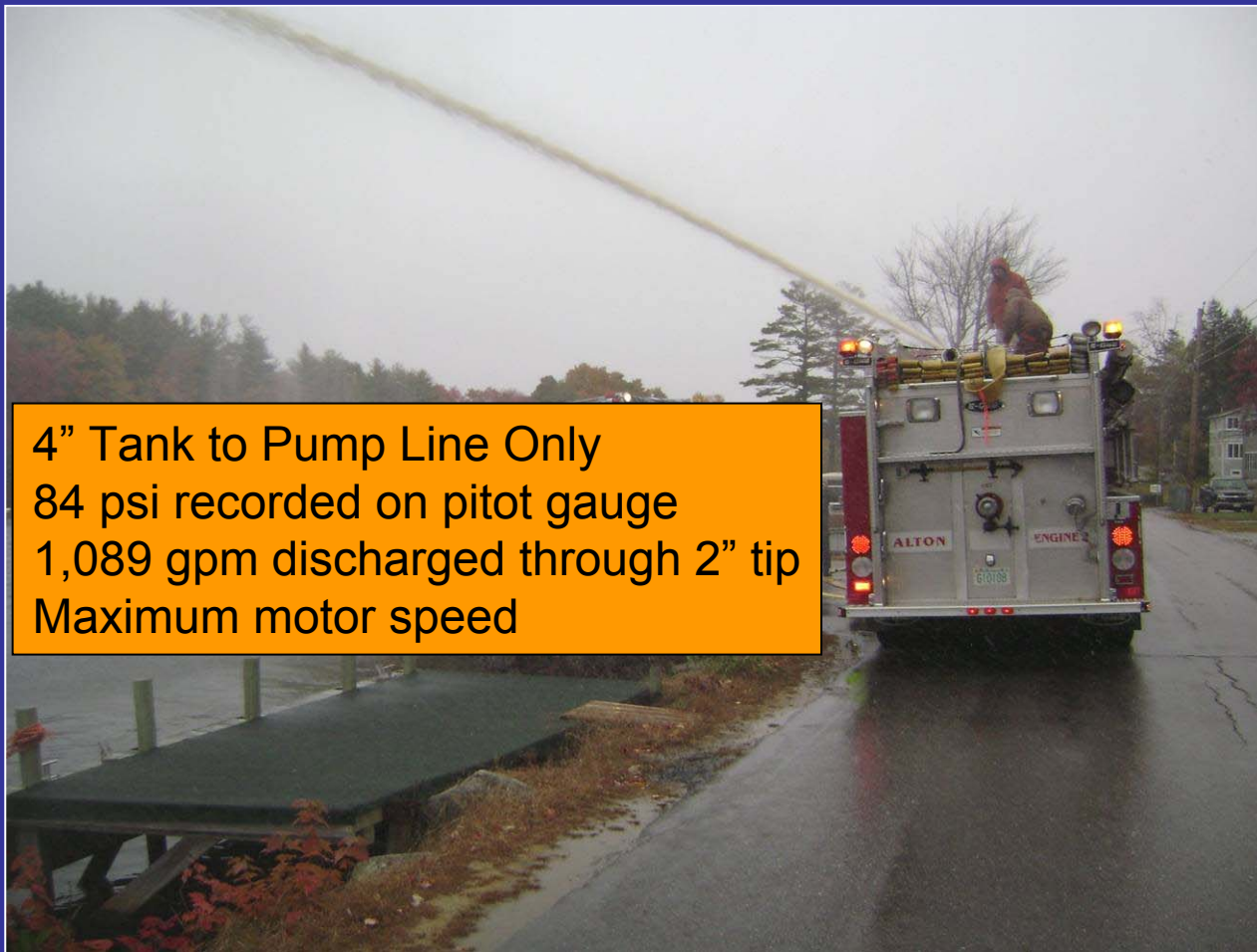
The Results: Flow Test #1

3" Tank to Pump Line Only
22 psi recorded on pitot gauge
557 gpm discharged through 2" tip
Maximum motor speed



LDH only used to refill tank.

The Results: Flow Test #2



Summary

- It was clear that the 4-inch tank to pump line was capable of flowing at least 1,000 gpm when the pump was taking suction from the 2,500-gallon tank.
- This flow was double the capability of the 3-inch tank to pump line which is standard on most pumpers.
- This test shows the importance of installing big tank to pump lines if you want to flow large flows from your tank either in a blitz attack mode or a nurse tanker (rural hitch) mode.



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