

**More About Cary's New Engines**

12/22/09 98 W, 1 I - + 8 - 6

Two 2009 Pierce Velocity pumpers, each with 1,500 GPM Waterous, single-stage pump; 500-gallon water tank; Husky 12 foam system with 30-gallon Class A and 25-gallon Class B foam cells; Detroit Series 60, 515 HP engine; Allison 6 speed transmission; TAK-4 suspension; front and side air bags; seat-belt monitoring system; Harrison 8 KW hydraulic generator; Whelen light package; LED compartment lighting; backboard compartment on hose bed cover; lights on hose bed cover; through-tank ladder storage; speedlays, the first for Cary pumpers. Expected in service in late January. [See more photos by Legeros.](#)



Anyone know if Cary will be hiring soon?

**091504** - 12/22/09 - 21:49

Does anyone use two-stage pumps anymore? Not that I am suggesting it, my curiosity got going when I read the part about a single stage pump. There are only a few departments I know of that have dual stage pumps and those are pretty dated. I know with advances in fire pumps it has probably phased them out a little but I didn't know if anyone had any specific reasons. Some of you experienced guys (not to be confused with old) chime in.

**rookie** - 12/23/09 - 06:48

Rookie, the actual reason for two-stage (and multi-stage for that matter) is to get more pressure by allowing pressurized water to flow from one impeller to the other, there by stacking (not exactly but you get the point) the pressure. Centrifugal pumps are capable of pumping significant volume at pressure, after a point (generally 150psi for fire service purposes) you begin to lose volume capacity with pressure. Conversely, a 1000 gpm pump rated at 150psi can give more than that volume but at lower pressures. As a note to this, this is at draft, so if you are using a pressurized hydrant system you could do even more volume and pressure if the system had the volume capacity.

As for the reason for two-stage pumps. If you need pressure you use series/pressure mode and the engine doesn't have to work as hard. Conversely, if you need volume you let the impellers work in parallel/volume mode. As for why you see less these days, the modern diesel engine is capable of its horse power output at much lower RPM's than the gas engines of the early fire service years and into the 1970's. The 1980 and later diesels you see with two stage pumps are usually due to the previous necessity that was continued (tradition?) on new acquisitions. You can still find them in use today. In the early 1990's when the Bank of America building in Charlotte was built Charlotte FD ordered 2 E-One engines with two stage pumps that were custom designed by Hale to deliver 600 psi if I remember correctly. They wanted to be able to pump the towers in the event the fire pumps failed in the building. I don't think I would want to be around that pump or the FD connection and supply hose if they had to use it.

**D.Cates** - 12/23/09 - 21:51

I think another factor is the cost savings of a single stage versus a two-stage pump. Cates, isn't there a significant difference between the price of the two?

**Dean Witter** - 12/24/09 - 07:45

I'm sure there is a difference since you are dealing with two impellers, volutes/housings and the change over valve. But the amount I can't exactly say, my guess would be \$2K-3K difference. It's been so long since I sold trucks and in the 4 years I did, I never sold a two-stage.

**D.Cates** - 12/24/09 - 11:40

Cool, here is a question for somebody, "what kind of pumps do the big cities like New York, Chicago and others have to pump on their high rises". I heard someone say Chicago has a couple pumpers that can pump crazy pressures but i cant remember!

Thanks and be safe over the holiday! Merry Christmas!

**jason lane** - 12/25/09 - 00:59

Great looking trucks. Congrats to Cary FD! Some departments (i.e. FDNY) have three-stage pumps and/or tandem pump to overcome elevation issues. I know many already know this aspect, but you can "tandem pump" with two single-stage pumps to create a "two stage" set up; or create a "four stage" layout with dual two-stage pumpers interconnected. Caution to the discharge gauge lines – sometimes gauge lines may blow off as you extend to higher pressures (plastic gauge lines are a weak link)! The pumps and fittings are tested to 500psi (NFPA 1901) and should withstand the extra pressure, but there is a pucker factor present (like Chief Cates said). HO-HO-HO.....MERRY CHRISTMAS ALL!!

**A.C.Rich** - 12/25/09 - 09:13

Several years ago I had a conversation with a FDNY Battalion Chief about high rise rigs in Manhattan. He told me that there are several rigs that are capable of very high pressure ( 700 psi's) but to his knowledge they had never been used due to possible damage that could be caused to the stand pipe systems when charged. Further, he told me that you needed permission from a Battalion Chief to flow these units at such pressures. I guess asking permission prior to hooking to the system.( wonder if they believe in the "asking forgiveness then permission" clause ) I know of one of these units. E-54 has a Ferrara High pressure rig. FDNY.....Home of the seagraves, getting Ferrara rigs with every bid.....

**Chris Gibbons** ([Email](#)) - 12/26/09 - 19:30

I work for Mo'ville and have seen those trucks. They are really nice. I got a question though. I have noticed on the new trucks that LDH discharges and deck guns have crank handles. I am assuming for how slow you can open them. Is this some new NFPA regulation or just how the county trucks were spec so thats what everybody went with? By the way, kudos to A.C. for mixing in the words "pucker factor". Any time you do that you get extra points!

**Spanky** - 12/27/09 - 12:15

The slower opening (and closing) discharges and intakes have been NFPA requirements on larger pump capacities (and therefore plumbing sizes). I have seen them on many of the 1500 gpm pumps around here.

**CFP 7021** - 12/27/09 - 13:52

Hahaha!! "Pucker factor" (extra points again, right!!). Yeah, Spanky there is a requirement for the type of valve and its closing capability. The NFPA 1901 standard requires a discharge of 3" or greater to use a "slow opening valve." Hand crank valves are the most common (some are air, hydraulic, electrical, or "slow pull"). You see these valves on all larger diameter discharges and on most deck guns nowadays. Better control of larger quantity water flow and water hammer are the concerns. NFPA 1901 (2009ed) 16.7.5.2 is the reference (cuz I ain't that smart).

**A.C. Rich** - 12/27/09 - 15:11

Shev, any word on the new rescues?

**Silver** - 12/27/09 - 15:32

Nope, there hasn't been any word about them.

However another pumper (pretty much identical to these two) is on order/in construction.

We should know more about other capital projects (Firehouse 8) after the first of the year, as they have been under a freeze.

**CFP 7021** - 12/27/09 - 15:56