Fire Apparatus & Emergency Equipment

# The Benefits of Standard Starting Engine Pressure

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By Frank R. Myers

As a teacher of fire service hydraulics for many years, I always noticed how new driver candidates always struggled with performing the hydraulic calculations—first on paper, then from memory. For those who do not practice math on a regular basis, it can be overwhelming in the beginning. There are some calculations that probably need pencil to paper that are not practical for field, rule-of-thumb

calculations. Many less complex calculations can be done in your head. It can be second nature if one practices it on a regular basis to keep his skills proficient. The saving grace is standard starting engine pressure (SSEP). It enables one to get water flowing, then step back and proceed with calculating getting the optimal pressure for his respective hoselines.

As we all know in the fire service, when called into action, we need to respond expeditiously, put our skills into action immediately, and perform on the scene decisively. The minute that attack line comes off the truck, we need to supply it with a safe pressure to get the ball rolling. SSEP accomplishes this. The SSEPs have been calculated to apply to many different types of hoselines and scenarios that apply to any given situation.

Given any circumstance, there is an SSEP for hose lays such as: standpipe operations, sprinkler operations, supply lines, foam lines (regular and low-friction), handlines/attack lines (regular and low-friction), master streams, and ladder/aerial/quint apparatus.

One of the more challenging and confusing aspects was getting water to a quint apparatus. Are we supplying the aerial device only or are we supplying the pumper a water supply? An easy way we would tell the candidates was to remember this query: Are we pumping *to* or *through*? Are we providing water with pressure only to the pump or are we supplying water and pressure through the aerial device and the water piping/riser to reach the elevated stream?

Our quints, as I would expect with most, have the intakes for the pump located at either side of the apparatus, front or rear, depending on how you have your apparatus spec'd out—and an intake specifically for the ladder pipe/riser only, which does not go through the pump. The SSEP for both scenarios is quite different.

When we received our new delivery for our aerial devices and quints, we would do research and development. We field tested supplying the aerial devices by attaching a piezometer with a small tube at the nozzle of the aerial device. We calculated the gpm needed for that nozzle on that apparatus and raised/flew the device at different heights and angles to determine a good, safe median pressure with the pump panel of the supplying apparatus to establish water flow with an SSEP. We came up with 170 psi. In contrast, a supply line with LDH would be 100 psi.

Another factor that presented a different scenario was our transition to low-friction hose for our handlines/jump lines/attack lines. For the nonlow-friction 1¾-inch lines, the SSEP was 125 psi and 200 psi if it was used in a foam operation. In contrast, the low-friction hose SSEP's were 100 psi and 180 psi for foam operations. My former department has pretty much eliminated the nonlow-friction hose and has gone exclusively to low-friction 1¾-inch hose. As a matter of fact, through field testing, we discovered you can go beyond the 200 feet after the foam eductor with the low-friction hose and still get foam out of the nozzle!

The 2½- and 3-inch hose carried on the trucks at my former department are nonlow-friction hose except for the high-rise kits. Therefore, when used as a handline, the 125 psi SSEP would apply.

The list of the SSEPs we used at my former department follows.

**Multiversal's/Master Stream Devices**: 100 psi
**Supply Lines**: 100 psi
**Sprinkler Systems**: 100 psi
**Handlines**: 125 psi
**Handlines (Low-Friction)**: 100 psi
**Standpipe Systems**: 150 psi
**Aerials**: 170 psi
**AFFF Foam Lines**: 200 psi
**AFFF Foam Lines (Low-Friction)**: 180 psi

As stated earlier, SSEP helps get the ball the rolling. Once the firefighters on the hoselines know that there is water coming at the right time for entry into structure, they are happy. There is no time for a driver standing at the pump panel to calculate the correct pressure and then supply water to the line. Is it perfect? No, but we can improve on it once we know preliminary actions and tasks have started successfully.

It can get more complicated when multiple lines are pulled off the apparatus. More so than ever this is where SSEP is the saving grace. Once water is flowing with a reasonable pressure, we can now kick back and start doing the calculations for the "proper" pressures.

During practical pumping hands-on examinations, the candidates would become overwhelmed. The hoseline equation given would start out by stating, "They pulled a handline out of the crosslays from the side of the truck." The candidates would then ask, "What size line and what nozzle and how long?" I would then respond by saying, "It doesn't matter right now, just get the water flowing." Then it would click that they needed to state the SSEP to me. After the pressure was set and the relief valve was set (if applicable) or pressure governor at the SSEP, the details of the line would then be given: length, diameter, and nozzle being used. Then the calculation could be performed. The same applies on the fireground! As always, practice makes perfect.

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