About Hose Testing

Stop Damaging Your Apparatus With Fire Hose Testing.

In the fire service today, it's only natural that fire hose and fire apparatus go together. But the practice of using your fire engine to test fire hose is something that the fire service just started doing.

Over the years many things have changed, however since the beginning hose testing procedures have stayed the same. Today's standards are written out in NFPA 1962, Care, Use, and the Maintenance of Fire Hose. This standard outlines the proper way to test fire service hose.

The construction of fire hose has not changed in any real significant ways, other than man-made fibers replacing the cotton material. So what has changed? It would be the testing device. The modern fire department has changed, although it still performs many of the same functions as it did 30 years ago. The ways these changes have affected the apparatus as a hose tester are very notable.

Thirty years ago standard fire apparatus pumps were rated at or about 500gpm. Today, the average has climbed to 1,250 to 2,000 gpm or more. Your apparatus pump is designed to deliver large volumes of water. When an apparatus pump that was designed to deliver 1,500 plus GPM is employed as a hydrostatic testing device, it is being used for a purpose in which it was never intended for.

The larger volume pumps of today develop tremendous amounts of kinetic energy. When this energy is not allowed to dissipate through the discharge of large water, serious issues will arise. Extreme heat will build up, cavitations will occur, and vibration is high. At volumes notably below the rated capacity, the centrifugal pump is being seriously misused. The effect is accentuated if the impeller speed is high and water flow is low and unable to keep the impeller cool. This kind of operation can result in serious damage to the impeller, cause erosion in the impeller eye along with the vanes. In extreme cases, catastrophic failure may occur. In other words, the pump is literally tearing itself apart. A very important note: Testing fire service hose with your apparatus pump will void your manufacturer's warranty.

Thirty years ago, most pumps were two-stage design. Today most apparatus are now single stage. The single stage pump has added to the problems. A single stage pump must operate at a higher RPM to develop pressures equal to a two stage pump. The greater the speed of the pump shaft, the greater potential for pump damage from excess heat, vibration or cavitations. Also, the amount of water supplied for cooling the pump shaft is limited to the flow discharge of the pump.

Example: If a 1000 GPM, single stage pump were to operate at 200 PSI, hose is normally tested at 250 to 300 PSI, the 15 gallons of water it takes to fill the pump under static conditions would be
heated at 35 degrees F. per minute. So 70 degrees of water would be heated to 212 degrees and boil in less than four minutes. NFPA requires that hose testing operate in five-minute intervals. The potential to damage the apparatus pump while testing fire hose is indisputable.

Thirty years ago the average fire apparatus was gasoline driven, and straight shift. Today's apparatus is diesel powered with automatic transmissions. Engine horsepower has increased. Larger motors and drive trains are being used to accomplish the task, which requires only a fraction of the horsepower.

In the past, new apparatus may have cost $30,000. Today, fire departments invest $250,000 or more on apparatus. Protecting your department's investments should be a major consideration. It would only make sense to accomplish the job of hose testing with a portable hose tester. The allocation for a hose-testing unit is normally less than one percent of the cost of a new engine.

The costs of fuel and general operating expenses have increased over the years, becoming a major budget item. It is more prudent than ever to decrease operating expenses by reducing unnecessary use of the apparatus. Hose testing can be accomplished best by using a portable hose-testing unit. This will reduce overall operating costs and keeping personnel and equipment in service.

Pressures to extend the service life of apparatus continue to increase. As the pressure continues, it becomes more important to employ apparatus judiciously. Operating a fire pump at a high speed with little to no water movement to test fire hose is one of the fastest ways to necessitate a major and expensive pump overhaul. Depending on the damage, expenditures on labor and parts could reach or exceed $7,500. Also take into consideration, the additional wear and tear on the motor and power train. Fire apparatus can't be used when it is out of service. Many departments have stopped using their apparatus to test fire hose, and have stopped adjusting or replacing the pump packing because of that.

One of the top priorities is SAFETY. The time has gone where safety hazards were tolerated as part of the job. The fire service has come of age and recognizes the hazardous conditions worked within day in and day out. Using your apparatus to test fire hose creates one more hazard to the firefighter. The noise of the engine inhibits concentration and verbal communications. Plus, there is a potential for a wild line. Many firefighters are injured each year testing fire hose.

Testing with a portable hose tester will prevent damage to your apparatus pump, and will help improve your ISO rating.