

# FIREHOUSE®

## Weekly Drill

### DRILL #62: PUMP TESTING

#### Introduction

As with everything we do in the fire service, caution should be taken when conducting the pump test. Proper personal protective equipment (PPE) must be worn. As a minimum, safety glass, hearing protection and gloves should be worn.

In general, there are two pump tests that are performed – an acceptance test and the annual test. The difference is the times established for each test. The test we are going to talk about in this drill will be the annual pump test.

The first part of the test is the positive pressure test. For this test, close the tank fill and tank to pump valves. Once this is complete, attach the hydrant lines to the intakes and charge them. Slowly open the intake valve and check under the truck to see if there is any water leaking from the pump seals and packing. A small amount of water leaking is acceptable; however, a large quantity will stop the test until the repairs can be made. After the test, turn off the hydrant and bleed off the pressure.

The next part of the test is the vacuum test. For this test, make sure the tank to pump valve and tank fill valve are closed, then drain the pump. Once the pump is drained, make sure all valves are closed and the caps are all tight and then activate the priming pump. Note the suction gauge will drop into a vacuum (negative pressure). When this has been accomplished, stop priming and turn the apparatus off. Keep an eye on the suction gauge and document the reading on the gauge at the start of the test, two minutes into the test and at the five minute mark. If a vacuum is maintained, the test was successful, but if the gauge returns to zero, repeat the procedures. If it does not hold a vacuum, repairs will be needed before furthering testing.

The next step is the priming device (drafting) test. Connect the hard suction intake to the apparatus and the discharge lines to the master stream device. Attach the pitot gauge to the master stream device and place the monitor gauge for the pitot near the pump panel where you will be able to read it during the test. Place a 2½-inch tip onto the master stream. Remove the cap on the RPM pump panel. This is where readings will be taken using the handheld RPM reader. If equipped with a pressure relief valve, assure that it is fully opened.



Start the apparatus and engage the pump. Prime the pump by bringing the RPMs up to 1,100. Activate the primer valve and operate the pump as you would during drafting operations. Document the amount of time it took to prime and start flowing water. The acceptable time for a 1,250 GPM pump is 30 seconds or less.

Pressure testing the pump is done by placing the appropriate tips on the master stream device for the desired pump pressure. Idle the truck down and shut down the flow of water while changing the tips between each test. Begin test #1 to flow 100% for 20 minutes. Record the data on the pump test sheet at the beginning, and then every five minutes until you hit the 20-minute mark. At the end of test #1, raise the pressure to 165 psi for five minutes. This is the overload test. Record the data at the end of the five-minute mark. Follow these same procedures for test #2 and #3.

Engine (1250 GPM)					
Test #	Flow	Tip Size	Pump Pressure	Pitot	Length of Test
1	100%	2½"	150psi	71	20 minutes
2	70%	2"	200psi	55	10 minutes
3	50%	1½"	250psi	48	10 minutes

The final test is the pressure control test or the relief valve test. Begin flowing water and set the pump pressure at 90 psi. Set the relief valve and then slowly close the discharge gates. An increase of 30 psi on the discharge is permitted. Repeat this test at 150 psi and 250 psi, an increase of 30 psi is permitted here as well.

–Prepared by Russell Merrick