Appendix J

Dry Vacuum Test For Suction Hose

Suction hose should be dry vacuum tested annually to a vacuum of 25 inches of mercury (85 kPa). The following describes dry vacuum testing using three different equipment setups for use to establish suction. These three methods of establishing suction are using suction off a fire engine, by use of a vacuum/pressure pump or by using an air transducer pump with a venturi.

1. Suction off a Fire Engine using the 2-1/2 inch (64 mm) suction valve and vacuum gage, as described in the Wildland Fire Hose Guide, February 1997, page 27.

2. Vacuum/Pressure Pump. Air pump comes with vacuum and pressure regulators and regulator assemblies. Maximum vacuum is 24 inches of Hg (82 kPa) and maximum pressure is 60 psi (414 kPa). Includes carrying handle, 6 foot (1.8 m), three wire cord with plug for 115 VAC, 60 Hz operation. Heavy and bulky. Cole-Palmer Model number JM-07061-40, vacuum/pressure pump with regulators. Shipping weight 17.4 pounds (7.9 kg) $335. Cole-Palmer 800-323-4340.

   Attach the suction hose to a suction source with the free end tightly sealed. The free end may be sealed by using a 1 inch (25 mm) or 1-1/2 inch (38 mm) cap. Reduce down to test 2-1/2 inch (64 mm) suction hose. It is important that all connections and fittings be tightened securely before vacuum testing is conducted for safety and the ensure correct test results.

   Obtain a vacuum of 25 inches of mercury (85 kPa) and shut the vacuum pump off. The hose should maintain the vacuum of 25 inches of mercury (85 kPa) for 5 minutes, with no loss of vacuum, with the vacuum pump off. If there is a loss of vacuum, suspect a loose seal. Check the connections and fittings for leaks and rerun the test. Disconnect the suction hose from the suction source and examine the inner and outer lining for collapse or failure.

3. Air transducer pump with venturi for use with compressed air. Light and easily transportable. An air operated vacuum pump used to measure a vacuum up to 28 inches of Hg (95 kPa). Vacuum transducer pump Air-Vac Engineering Model AVD320H $88, available from Willard Engineering 526-663-0730. Cost of the indicated connections and fittings is approximately $25. The test setup using the air transducer pump with venturi is as follows:

This procedure describes a method to test suction hose for serviceability using an air transducer pump with venturi. For this test, the ends of the hose are capped and a vacuum is applied. The hose is then inspected for leaks and collapse (see figure 1).

PARTS LIST

Item	Quantity
Vacuum Transducer Pump (venturi), Air-Vac Model AV 191H	1
Reducing Nipple, 1/4" NPT x 1/8" NPT	1
Quick Disconnect Coupler, (as needed for shop air connection)	1
Needle Valve, 1/8" NPT x 1/8" NPT	1
Poly-Tite Male Connector, 1/8" NPT x 1/4" Tube	1
Poly-Tite Male Connector, 1/4" NPT x 1/4" Tube	1
Poly-Tite Tubing, 1/4" x 36"	1
Poly-Tite Nut and Sleeve, 1/4"	2
Pipe Street Tee, 1/4" NPT	1
Female Adapter, 1/2" NPT x 3/4" NH (garden hose type with washer)	1
Pipe Bushing, 1/4" NPT x 1/2" NPT	1
Reducer, 1-1/2" NH x 1" NPSH	1
Double Male, 1-1/2" NH x 1-1/2" NH	1
Reducer, 1" NPSH x 3/4"HN	1
Cap, 1-1/2" NH	1
Reducer, 2-1/2" NH x 1-1/2" NH (for testing 2-1/2" hose)	2
Double Male, 2-1/2" NH x 2-1/2" NH (for testing 2-1/2" hose)	1

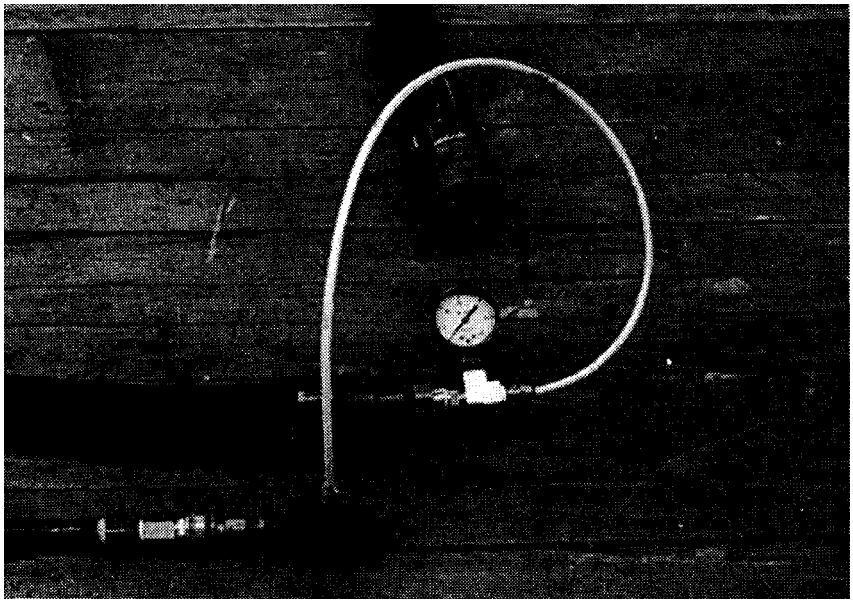

Figure 1—Test setup.

Assembly Instructions

- Use anti-seize tape or compound on all NPT connections.
- Attach the quick-disconnect coupling to air supply port on the vacuum transducer pump using the 1/4" x 1/8" reducing nipple (see figure 2).
- Attach the needle valve to the suction port of the vacuum transducer pump
- Attach the Poly-Flo tubing to the needle valve using the 1/8" x 1/4" Poly-Tite male connector and a Poly-Tite nut and sleeve.

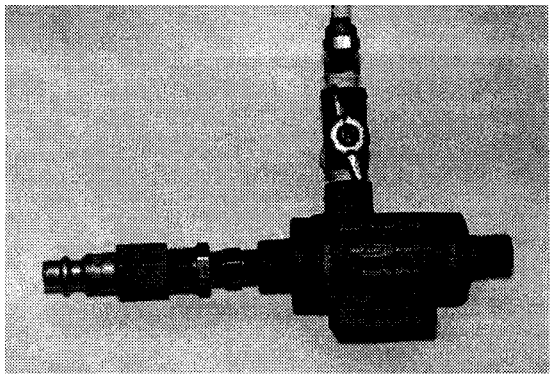

Figure 2—Vacuum transducer pump.

- Attach the vacuum gage to the garden hose adapter using the pipe street tee and 1/4" x 1/2" pipe bushing (see figure 3.
- Use the Poly-Tite 1/4" x 1/4" male connector and a PolyTite nut and sleeve to attach the Poly-Flo tubing to the pipe street tee.
- Attach the assembly to the female end of the suction hose using the double male and reducers.

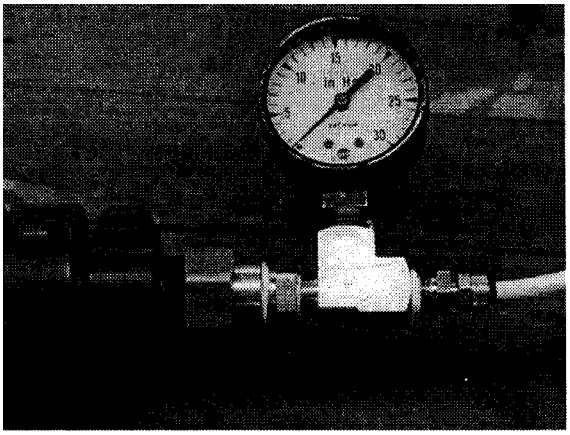

Figure 3—Vacuum gauge.

Test Procedure

- Complete the above assembly instructions.
- Cap the male end of the hose and make sure all connections are tight.
- Start with the needle valve on the vacuum pump closed.
- Apply shop air to the Vacuum Transducer Pump (venturi) as shown in figure 4.

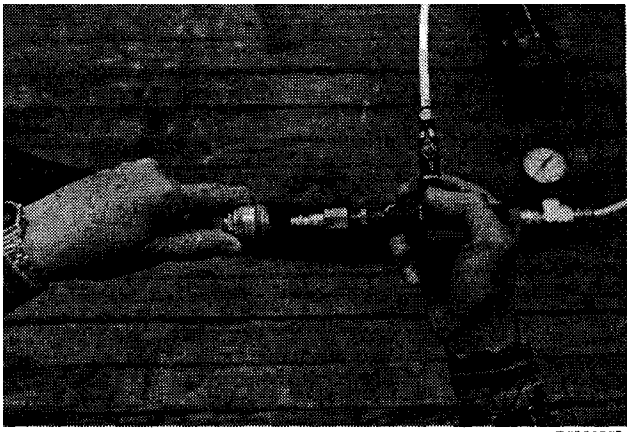

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Figure 4—Apply shop air.

- Open the needle valve slowly to apply a vacuum of 25 in-Hg (85 kPa) as read on the gage, then close the valve (see figure 5).
- Disconnect or shut off the air supply to the venturi.
- The vacuum should hold at 25 in-Hg-(85 kPa) for at least 5 minutes.
- Inspect the hose carefully for leaks and collapse of the jacket.
- If there are leaks, check the fittings and connections to ensure all connections are tight.
- Repeat the test procedure before reinspecting the hose

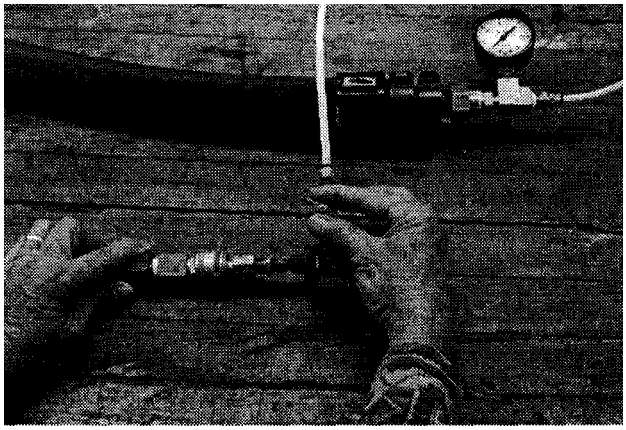

Figure 5—Apply vacuum.

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