TOLEDO FIRE & RESCUE DEPARTMENT

D-7 Hose and Hose Testing

Maintenance Manual

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HOSE

Definitions

- **Fire Hose** is a flexible conduit for moving water. It is constructed with one or more jackets, (internal layers), and an approved non-permeable lining.
- **Supply line** is defined in operational usage as a line from the water source to a pump.
- **Attack line** hose is designed to supply water to handline nozzles, master stream appliances, manifolds, standpipes, sprinkler systems, and fire pumps.
- **NST** - indicates National Standard Thread coupling.
- **HP** - indicates High Pressure.
- **LDH** - indicates Large Diameter Supply Hose.

Note: The terms Supply Line and Attack Line Hose can be used differently in operational usage, as opposed to the NFPA definitions relating to design, design verification, and testing of new fire hose.

To clarify language usage:
Supply Hose and Attack Hose are designators that the NFPA assigned in order to categorize fire hose by pressure. Per the NFPA designations, Supply hose is used at or below 185 psi; Attack hose is used at pressures above 185 psi.

These titles are confusing to many fire departments, as in operational usage, you can attack with NFPA defined supply hose and supply with NFPA defined attack hose.

- The standard vernacular of the Toledo Fire and Rescue Department categorizes and describes fire

hose in accordance with its operational use.

- **Attack line** - Any fire hose connected to the discharge of a pump that is used to apply water or other fire fighting agent directly to a fire or burning substance. The hose will ultimately terminate using a combination or smooth bore nozzle. The TFRD primarily uses 1 3/4” and 2 1/2” for attack line.

- **Supply line** — Any fire hose used to transport water from one source to another, such as from a hydrant to a fire engine or from one engine to another apparatus. TFRD primarily uses 5” LDH or 3” for supply line.

Double Jacketed Hose Types

- 1 3/4” Attack Line
  - 75' lengths with a 1 1/2” NST Couplings
  - Normally pre-connected; 2 banks of 1 4” line carried on engines
    - First bank with 2 lengths for a total of 150'
    - Second bank with 3 lengths for a total of 225’
- 2 1/2” Attack Line
  - 50' lengths with 2 1/2” Non-National Standard Coupling (Toledo Thread)
  - Engines carry a pre-connected bank of 200'
    - Can also be used to supply from pump to pump or pump to appliance.
- 3” Supply Line
  - Attack line to supply pump to pump or pump to appliance.
  - 50’ with 2 1/2” Non-National Standard Coupling (Toledo Thread)
  - Various shorter lengths called “Cheaters”
  - Engines carry 500’
- 5” High Pressure LDH Double Jacketed, Woven Outer Jacket, PVC/Nitrile rubber lined.
  - 25' and 50’ lengths with 5” Storz couplings
  - This hose is NFPA designated as Attack Line and is used in the operation of **supplying** water from an engine to an aerial. This hose is carried on TFRD trucks only. Generally used between the supply engine through the manifold to the aerial apparatus. The high burst strength of this hose provides extra protection for personnel operating on or around a working aerial.

Single Jacketed Hose Types

- 5” LDH Single Jacketed Supply Line (Rubber Outer Jacket) 100' lengths with 5” Storz couplings.
  - Engines carry 1000’ of LDH and assorted short lengths called “cheaters”. These are used for supply operations when only a short length is required.

ANNUAL HOSE TEST

All fire hose assigned to fire companies is to be tested under the direction of the Battalion Chiefs. The annual testing of hose shall be completed during the month of May.

- Test all hose assigned to line and reserve apparatus.
- All hose shall be physically inspected before testing. Check for:
  - Damage to couplings and threads and swivels
  - Debris on hose (remove, to prevent chafing)
  - Rot/Mildew
  - Burns or abrasions
  - Chemical damage
  - Gaskets in place

If hose fails physical inspection, it shall be removed from service and sent to the Maintenance Bureau.

- Individual Hose Reports (300-2) shall be forwarded to the Maintenance Bureau for each section of hose failing test.
- Suction hose test shall consist of a careful examination of jacket, swivels, gaskets, and threads.
- Hose I.D. numbers engraved into male couplings shall be examined for legibility.

It must be recognized that development of test pressures as high as 250 psi, used for service testing, introduces a serious accident potential. It is imperative that all members maintain a high level of situational awareness, and that all procedures are strictly followed.

Hose Testing Procedures

- Service Test Pressures for TFRD Hose:
  - All double jacked hose including 1 3/4”, 2 1/2”, 3”, and 5” are tested at **250 psi**
  - All single jacked hose including 5” LDH are tested at **200 psi**
- The maximum continuous hose length allowed for hose testing is **300 feet**. Make sure that lines are straight and without kinks or twists. Record identifying numbers of lengths to be tested.
- All hose shall be laid out flat prior to being tested. To test 3“ or larger diameter hose, a short length of smaller diameter hose with the same or higher proof pressure shall be used to connect the pressure source to the hose being tested.

- A test location shall be selected that allows connection of the hose testing pressure source (apparatus pump) to an adequate water source (hydrant).
- A hose test valve consisting of a fire department gate valve with a 1/4” opening drilled through the gate should be used between the pump and the hose test layout. The test layout shall be connected to the hose test valve. The hose test valve shall not be connected to any discharge outlet at or adjacent to the pump operator’s position. A test cap with a bleeder valve shall be attached to the far end of hose line in test layout. If a test cap is not available, a nozzle can be attached to the end of the hose being tested. Both ends of the hose shall be secured to prevent whipping in the event of a hose burst. Contact the shop for all testing supplies.
- Fill hose with water using hydrant pressure. After the hose is filled with water and all air has been expelled from the hose, close the nozzle or test cap valve slowly, then the hose test valve (if used) shall be closed. If test valve is not used, cut back the discharge gates to almost nothing. If a section should burst, the hose should not whip as much as it would with the gate fully open. Check all couplings for leakage and tighten couplings with a spanner wrench where necessary. Mark hose at edge of the coupling to determine if the coupling has slipped after testing.
- Raise pressure slowly to 250 psi for Double Jacketed hose (Woven Outer Jacket), 200 psi for standard Single Jacketed (Rubber Outer Jacket) LDH. After the correct pressure is obtained, hold the test pressure for **five (5) minutes**. During this time, walk down the line and inspect for coupling leaks or pinhole leaks. NEVER straddle a hose under pressure. Personnel should keep a distance of at least fifteen (15) feet from the hose, except as necessary to inspect couplings.
- After five (5) minutes, reduce engine to idling speed, close hydrant, disengage pump, and open drain valve on engine to reduce pressure in lines under test. When pressure drops below 100 psi, open nozzle slowly to finish relieving pressure, close gates, and disconnect lines.
- Any burst lengths, leaking couplings, slippage of couplings, pin holes, or lengths with weak spots should be taken out of service; identify affected area by tying a rag around the area and send to the Maintenance Bureau, along with the Hose Repair Request (300-2).
- After testing, hose should be properly drained and dried.
- After hose has been tested and drained, it shall be checked for proper marking. Hose should be marked on both ends of the coupling and marked within 2 feet of the coupling on the hose.

Retesting of Hose That Has Been Repaired

All hose that has been repaired shall be tested ASAP and the results recorded. All hose returned from repair shall be tested in a safe manner following the previously described procedures. The Maintenance Bureau does not have the facilities or the manpower to test all hose that is repaired. It is, therefore, the station Captain’s responsibility to see that this is completed and recorded on the previously mentioned inventory form 300-1.

Annual hose inventory

- Annual hose inventory shall be completed after all testing is complete within the station.
- Hose inventory form which includes inventory, testing and repair of all fire hose can be found on TFRDWed under Station Dashboards and Bureau Forms.
- Testing and Inventory shall be completed by June 1st.

See Also:
