

Los Angeles City Fire Department.

TRAINING BULLETIN

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TRAINING BULLETIN NO. 15 (REVISION)

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FOAM NOZZLE

American LaFrance #600

DESCRIPTION

The American LaFrance #600 Foam Nozzle is a device that produces "mechanical" airfoam by drafting low expansion foam concentrate liquid (6% A.F.F.F. concentrate) from a container, and mixing this foam concentrate with the incoming water stream and then entraining outside air which mixes with the water-foam solution to form a foam consisting of millions of tiny air bubbles.

The nozzle is of the "aspirating" type in that air is aspirated or mixed with the liquid water-foam solution at the nozzle. This nozzle differs from the "non-aspirating" type nozzles which are used with foam systems that pump and mix foam-water solutions and air at the pump or the type of nozzle used with "chemical" foam where carbon dioxide bubbles are formed from an acid-base chemical mixture.

OPERATION

A. Eductor System

The butt end of the nozzle is provided with an "eductor" to siphon foam concentrate from containers. The incoming water flows through a converging jet or nozzle into a spreader housing where a low pressure area is created which drafts concentrate from the container through the pick-up tube, through a metering orifice to provide the correct proportion of water and foam concentrate solution. The nozzle is provided with a standard drilled 1/4" orifice, permanently installed, for use with the Department's 6% A.F.F.F. concentrate, and is the only orifice to be used (see diagram, page 5).

The foam inlet and pick-up tube are provided with a 3/4" garden hose thread. The pick-up tube can be extended with a 3/4" garden hose up to 50' provided the couplings are in good condition and do not leak air. First remove the pick-up tube from the nozzle barrel (page 4, Item 9). Using the male end of the garden hose, thread it into the barrel (left hand twist the garden hose sufficiently to attach, then insert into the barrel). The pick-up tube is then attached to the female of the garden hose.

B. Diffuser

A cone-shaped device is installed in the waterway, with the point facing the incoming stream, which spreads or diverts the stream into a conical or spread pattern so that the stream will hit the interior circumference of the barrel. A shielded air inlet to the barrel is provided at the butt end of the nozzle (see diagram, page 5).

This diverging stream picks up air by friction and mixes it with the water-foam solution within the barrel and forms tiny foam bubbles. This air pick-up can be likened to sweeping leaves from a lawn with a garden hose without actually wetting the leaves.

C. Restrictor

A "tear-drop" shaped restrictor is provided in the center of the barrel near the tip end to adjust the flow at the center of the stream to travel at an equal velocity with the outer portion of the stream so that the entire cross-sectional area has the same velocity as it leaves the nozzle.

OPERATING CHARACTERISTICS

The nozzle has an effective nozzle diameter (jet orifice) of .450" for computing water flow. The minimum operating pressure at the nozzle is 50 p.s.i. The approximate flows are shown in the following table:

Inlet water pressure	50 psi	75 psi	100 psi	125 psi
G.P.M. of water	52	53	60	68
G.P.M. of foam concentrate, 6%	2.9	4	4.1	4.1
G.P.M. of air foam	400-450	525-575	575-625	625-700
Effective range in feet	35	45	55	65
Vacuum of foam inlet, closed, Hg.	27"	27"	27"	27"
Friction loss per 100', 1-1/2" hose	7 psi	10.5 psi	13 psi	17 psi

ADAPTIONS

The nozzle can be used without the pickup tube when pre-mixed water-foam solutions are available from in-line eductors or mixing systems provided on Crash Trucks or Fire Boats. When the nozzle is used in this manner, a plug with 3/4" garden hose thread is provided to plug the pickup inlet. If the mixing system has sufficient capacity, the eductor jet can be removed to give greater flows. Without the jet nozzle, the device will deliver 75 g.p.m. at 75 p.s.i. of the pre-mixed solution.

USE OF THE NOZZLE

Use a shut-off butt on the nozzle to control the flow, particularly when "in-line eductors" are used and water flow may exceed capacity of eductor to pick up concentrate. The shut-off should be closed slightly to provide the best foam.

The nozzle and pickup tube shall be flushed thoroughly with fresh water after use.

REMINDERS

Foam can be made with fresh or salt water.

Foam can be used in conjunction with dry chemical extinguishers.

Foam is effective on most Class B fires. Do not use on water soluble flammables such as alcohols, esters and ketones; these require a special alcohol or all purpose concentrate. (700 gal. ATC and nozzle available at shops).

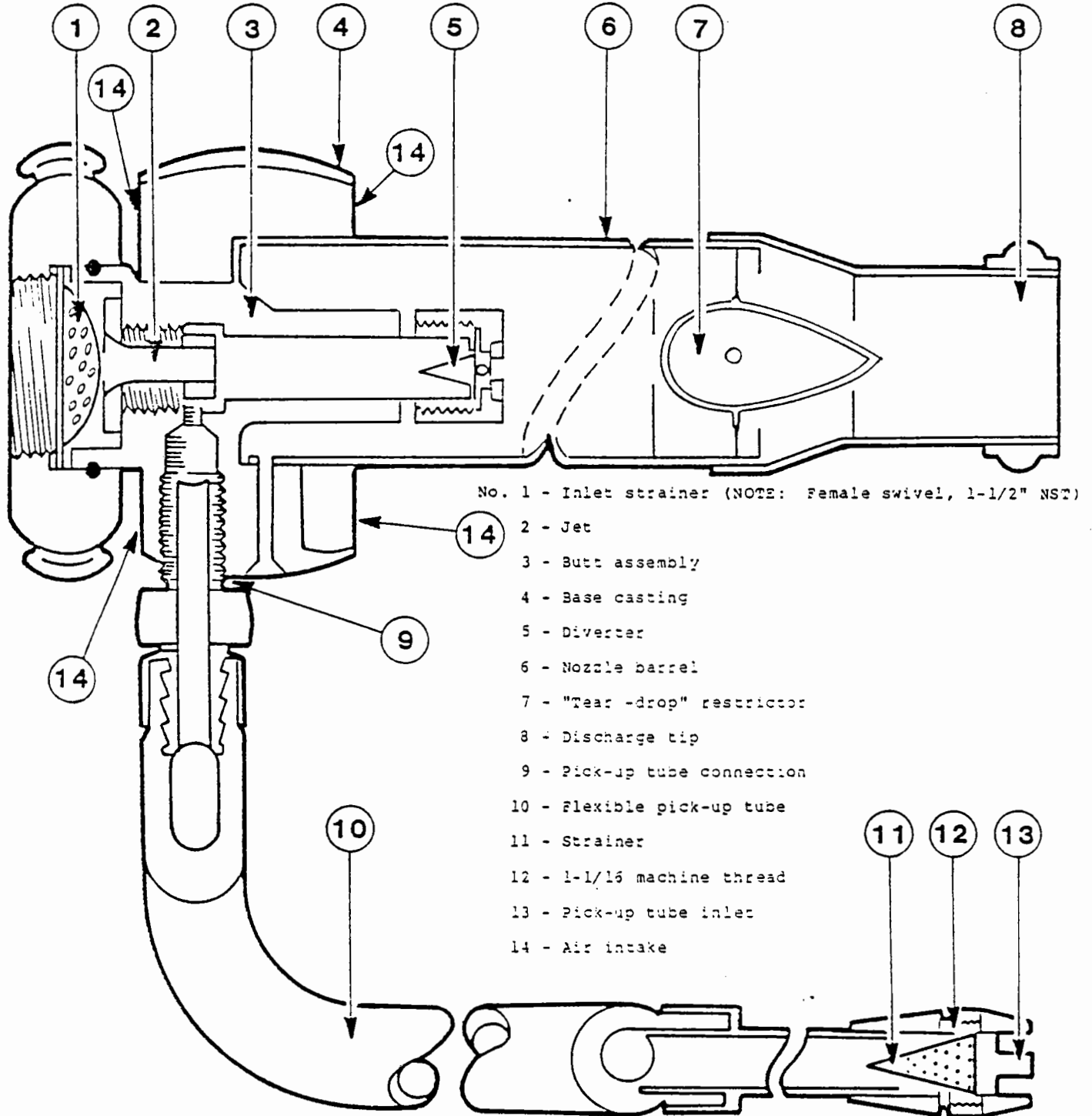
Foam should be applied to fall lightly on the surface burning; it may be necessary to stand away from a fire and "lob" the foam in.

NOTE: Reference Training Bulletin Number 27 and Drill Manual 6/2-02.01 for additional information.

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