Annual Pump Testing

I. PRESENTATION:

A. In order to insure top performance and discover impending deficiencies, the Insurance Services Office requires that each pumper be given an annual in-service test.

B. Test requirements, materials needed and general procedures are shown in the booklet "Fire Department Pumper Tests and Fire Stream Tables," (The Little Red Book). Tests are conducted at the drill grounds or at a city reservoir. Special equipment such as the pitot gauge, master pressure gauge, electric tachometer and hard suction adapter are supplied by the training division.

II. APPLICATION:

1. Place apparatus to be tested near the drafting site.

2. Remove hard suction hose, strainer rope and utility rope from apparatus.

3. Lay out hard suction hose (use 5" for annual tests on 1000 GPM pumpers, 6" for 1500 GPM pumpers) in front of apparatus in line with point of entry to supply source.

4. Attach strainer.

5. Tie a clove hitch just above strainer-end coupling with strainer rope and attach harness snap to strainer.

6. Using utility rope, tie clove hitch just below center couplings and secure with overhand knot. Tie two half hitches on upper section of hose equally spaced (one-third, two-thirds) along hose.

7. Lower suction hose into water while guiding suction strainer with strainer rope.

8. Remove proper hard suction inlet cap (and adapter if 6" to 5" adapter is to be used) to drain pump.

9. Move apparatus forward until inlet is in line with suction hose.

10. Connect suction hose to inlet (check gasket).

11. Support suction hose with remaining utility rope using half sheepshank to a point on apparatus directly above inlet if possible. Caution: Avoid any humps in suction hose, which will affect priming ability and tighten all joints securely.

12. Connect 2 1/2" lines to discharge outlets on pumper (100' for each line).

13. Connect 2 1/2" lines to siamese inlets on monitor or deluge set.

14. Select proper nozzle tips for tests as per NFPA Fire Stream Tables. Nozzle pressures must be set to produce 100%, 70%, and 50% of rated capacity in GPM.

15. Connect pitot to nozzle and pitot gauge to engineer's panel. Pitot tube inlet must be set in center of stream and one half the diameter of the tip away from the tip opening.

16. Connect the electric tachometer to the distributor and ground observing the positive and negative markings on the wire clips. On diesel engines mechanical tachometers must be used.

17. Change transfer valve to volume or capacity position (Note: Pump will prime in pressure or series position).

18. Start engine and set all controls for pumping.

19. Engage priming pump (on electric primers, the priming valve opens using the same control device) and open priming valve.

20. Record time required to obtain good flow from priming pump. Should be 30 seconds or less.

21. Run pump at approximately 75 P.S.I. until engine temperature reaches normal operating level and check for leaking couplings and kinks in hose with all lines flowing.

22. Measure height of lift from water surface to center of the pump (eye of impeller).

23. Determine (from Little Red Book) the correction factor for lift to be subtracted from discharge pressure to obtain "net pump pressure" desired.

24. Adjust throttle and discharge gates to obtain proper pressure and GPM for first test and note time test starts. (150 PSI, "net pressure", at full rated capacity for 20 minutes.)

25. Watch all gauges during test, oil pressure, engine temperature, discharge pressure pitot pressure, tachometers and transmission temperature if provided.

26. Record all required readings on "pumper test record" a few minutes before test is completed.

27. Idle down engine.

28. Close discharge gates.

29. Select tip for second test and attach to monitor.

30. Readjust Pitot tube.

31. Repeat steps 23 through 28 running second test at 70% of capacity for 10 minutes (it may be necessary to change to pressure mode).

32. Select tip for third test and attach to monitor.

33. Readjust Pitot tube.

34. Repeat steps 23 through 28 running third test at 50% of capacity for 10 minutes (Pump must be in series or pressure mode.)

35. Select tip for spurt test and attach to monitor.

36. Increase pump pressure and open all lines fully.

37. Continue to increase pressure slowly until reaching either 150 PSI net pump pressure or 80% of peak engine R.P.M. - USE EXTREME CAUTION not to exceed safe operating conditions for apparatus being tested. If net pump pressure cannot be obtained with gates fully open, close all gates evenly until reaching desired pressure.

38. Immediately take all required readings. Test should not exceed 3 minutes.

39. Idle down engine and let run in neutral until engine temperature returns to normal or 5 minutes, whichever is longer. NEVER turn off a hot engine unless an emergency develops.

40. Restore all equipment to proper locations and pumper to normal.

41. NOTE: Be sure to refill priming reservoir on return to quarters.