Pump Service Testing

SCOPE

This guideline shall apply to all members of the Stoney Point Fire Department (SPFD) and shall be adhered to by all members responsible for conducting pump service testing.

PURPOSE

All apparatus with fire pumps exceeding 500 GPM will receive annual pump testing. The on duty staff may also request pump testing post significant incidents in which the pump may have been damaged, significant repairs or as needed to assure that the apparatus will perform to its capacity. After completing all of the required/recommended testing Guidelines the results will be filed with all maintenance records for that specific piece of equipment. If for any reason the pump fails to pass the testing Guideline the on duty officer will notify the Fire Chief Immediately.

Policy Number

6A.013

All apparatus must be properly maintained in accordance with the manufacturer's guidelines. This is in addition to the weekly maintenance check. A trained fire apparatus service technician should be used for all work on Stoney Point Fire Department apparatus with oversight by the Station Maintenance Officer.

Each individual apparatus will be given a complete preventive maintenance check at least once a year.

All Stoney Point Fire Department apparatus with pumps will be service tested at least annually, in accordance with NFPA 1911.

The Station Day Shift Captain shall oversee the annual testing and proper documentation of each piece of fire apparatus. At the conclusion of the testing the Day Shift Captain shall notify the Fire Chief of any deficiencies or units that failed to pass.

Procedure

1. Safety Precautions During Service Tests

   A. All personnel should wear protective clothing and hearing protection.
   B. Prevent water hammer: Open and close all valves and nozzles slowly.
   C. Do not stand over or straddle hose.
   D. Mark all discharges and couplings, and monitor for separations.
   E. Manipulate engine throttle slowly. Prevent sudden changes, which can damage equipment and personnel
   F. Tie down test nozzles and equipment securely.
   G. Walk, don't run. And watch where you are walking
   H. Beware of the location of all personnel in relation to hose lines.

2. Guidelines for test conditions

   A. Air Temp. (0-100 F)
   B. Water Temp. (35-90 F)
   C. Barometric Pressure (29 in. Hg. Minimum, Corrected to Sea level)
   D. Vacuum (Minimum required shall be permitted to be reduced by 1 in. Hg. For each 100 ft. of elevation)
   E. Max. Lift (10 Feet)
   F. Suction Hose (Max. 20 ft.)
   G. Water Supply (Test at draft if possible)
   H. Pump Pressure (All tests are conducted at Net Pump Pressure)

3. Engine Accessories (All drive train, electronics, and load management shall operate as normal)

4. Test Results (All test results must be within 90% of the original delivery rating of the unit NFPA 1911, current edition) TESTING GUIDELINES

5. Engine Speed Check (No Load Governed Engine Speed)

   A. Check all fluids prior to test
   B. Bring engine to normal operating temperature (Approx. 180-190 F)
   C. Chock Wheels
   D. Set parking brake
   E. Place transmission in neutral (N) position

F. Test maximum governed engine speed using throttle pedal in cab
G. Record records results on worksheet
H. Proceed to dry vacuum test

Test # 1 (Dry pump vacuum test)

A. Drain main pump (close tank to pump valve)
B. Connect 20 ft. (2 10ft. Sections) of hard suction hose to pump suction
C. 1000 GPM- 5in. hose
D. 1250 GPM- 6in. Hose
E. 1500 GPM- 6in. Hose
F. Cap hard suction hose
G. Close all discharge, drain, and tank fill valves
H. Cap all pump intakes and open all intake valves (Close all intake drains)
I. Uncap all pump discharges (Valves closed)
J. Run priming pump until max. in. Hg. Is achieved on apparatus gauge
M. Do not run priming pump for more than thirty seconds
N. Record time required reaching both 22 in. Hg. And max. in. Hg.
O. Turn off engine and priming pump, listen for leaks
P. Observe vacuum reading for 5 minutes. Max. allowable drop- 10 in. Hg. In 5 minutes Record test results on test sheet

Test # 2 (Priming test)

A. Set up pitot with proper nozzle size for capacity test
B. Remove suction hose cap and replace strainer
C. Attach rope to suction hose and strainer
D. Place hard suction in to the pit
E. Submerge the strainer at least 24 in. below the surface
F. Tie of hose with rope
G. Use chaffing pad on hard suction as needed
H. Measure water level in pit (Max. 10 ft. lift)
I. Chock wheels on the engine
J. Set up pitot manifold (Deck Gun)
K. Start engine and engage pump
L. Place transfer valve in parallel or volume position (Skip if Single Stage)
M. Start priming pump and stop watch, time priming test
N. Test ends when water discharges at nozzle and out the priming pump
O. 1000 and 1250 GPM pumps must be under 30 seconds
P. 1500 GPM may allow 15 seconds extra if equipped with 4 in. front/rear suction

Q. Maintain minimum of 50 PSI pump pressure
R. Maintain water flow
S. Record results on worksheet

Test # 3 (100% Capacity @ 150 PSI. 20 Minutes)

A. Select and set up proper pitot nozzle size for GPM
B. Place transfer valve in parallel position
C. Slowly raise pump pressure and pitot pressure to desired readings
D. Re-measure lift distance
E. Start time test and record all gauge readings on worksheet
F. Obtain and record all manual pump readings within one minute of 5 minute readings
G. Continue test for 20 minutes from 1st recording
H. Record all gauge readings at 5 minute intervals
I. Monitor engine and pump performance

Test # 4 (Pressure Control Device Test @ 90 PSI)

I. Obtain 90-PSI. By adjusting engine throttle only
II. Set pressure control device for 90-PSI
III. Slowly close all discharge valves one at a time
IV. Observe and record pump discharge pressure rise on worksheet
V. Open discharge valve to allow water to flow

Test # 5 (70% capacity @ 200 PSI. 10 Minutes)

A. Select and set up proper pitot nozzle size for required GPM flow
B. Place transfer valve in Parallel position
C. Slowly raise pump pressure and pitot nozzle pressure to desired
D. Start time test and record all gauge readings on worksheet
E. Obtain and record all manual pump counter readings
F. Continue test for 10 minutes
G. Record all readings in 5 minute intervals
H. Monitor engine and pump performance

Test # 6 (50% Capacity @ 250 PSI npp)

A. Select and set up proper pitot nozzle size for required GPM flow
B. Place transfer valve in series position
C. Slowly raise pump pressure and pitot nozzle pressure to desired readings
D. Start time test and record all gauge readings on worksheet
E. Obtain and record manual pump counter readings
F. Continue test for ten minutes

G. Record all information on the worksheet at every five-minute interval.
H. Monitor engine and pump for performance

Test #7 (Pressure control device test @ 250 PSI npp)

A. Obtain 250-PSI. By adjusting engine throttle only
B. Set pressure control device for 250-PSI.
C. Slowly close all discharge valves one at a time
D. Observe and record pump discharge rise on worksheet (Not to exceed 30 PSI)
E. Open discharge valve to allow the flow of water.
F. Slowly reduce engine speed, and shut off water flow
G. Disengage main pump
H. Idle engine for ten minutes before shutting down

ALLOW ENGINE TO RUN FOR ADDITIONAL 10 MINUTES, CYCLE PUMP
End of test Guidelines

A. Check engine for abnormalities and engine fluid leaks
B. Check and refill all engine fluids as needed (Do not open radiator)
C. Check, clean, and return all equipment used
D. Clean test site
E. Note all problems or observations on service testing form.
F. Advise duty captain or paid staff member of any problems found or equipment that needs to be taken out of service.
G. Complete the final results section of the service testing form
H. Complete and sign service testing form.
I. Service testing record should be then filed in Apparatus maintenance book.