

Pump Test Spreadsheet Installation and Operation Instructions

RECOMMENDATION: Read ALL of these instructions *BEFORE* installing and using the spreadsheet.

Overview

This package contains a single spreadsheet named 'pumptest.xls' which should be saved on your local hard disk. The spreadsheet can be personalized with your specific operational data and used to capture the measurements of an NFPA 1911 annual apparatus pump service test. It will automatically calculate many results based on your input and alert you when many valves are outside of normally accepted values.

Prerequisite Software

To run this package successfully, you will need to have a copy of Microsoft Windows and Microsoft Excel. The program has been tested under Window 2000, Windows Me and Windows XP and under Excel XP. It should also run under other versions of Windows and later versions of Excel.

Installation

Place a copy of pumptest.xls on your hard disk. Typically you would copy this to your "My Documents" folder.

Personalization

Open `pumptest.xls` with Excel. The first time you open this file, you will see a pop-up like the one shown in [Figure 1](#) alerting the user to the fact that this spreadsheet contains macros. These macros automate some of the tasks involved with creating service test documentation and should be enabled. To avoid getting this pop-up every time you use this spreadsheet, **you should check the “Always trust macros from this source.” as shown in [Figure 1](#) and then click the “Enable Macros” button.**

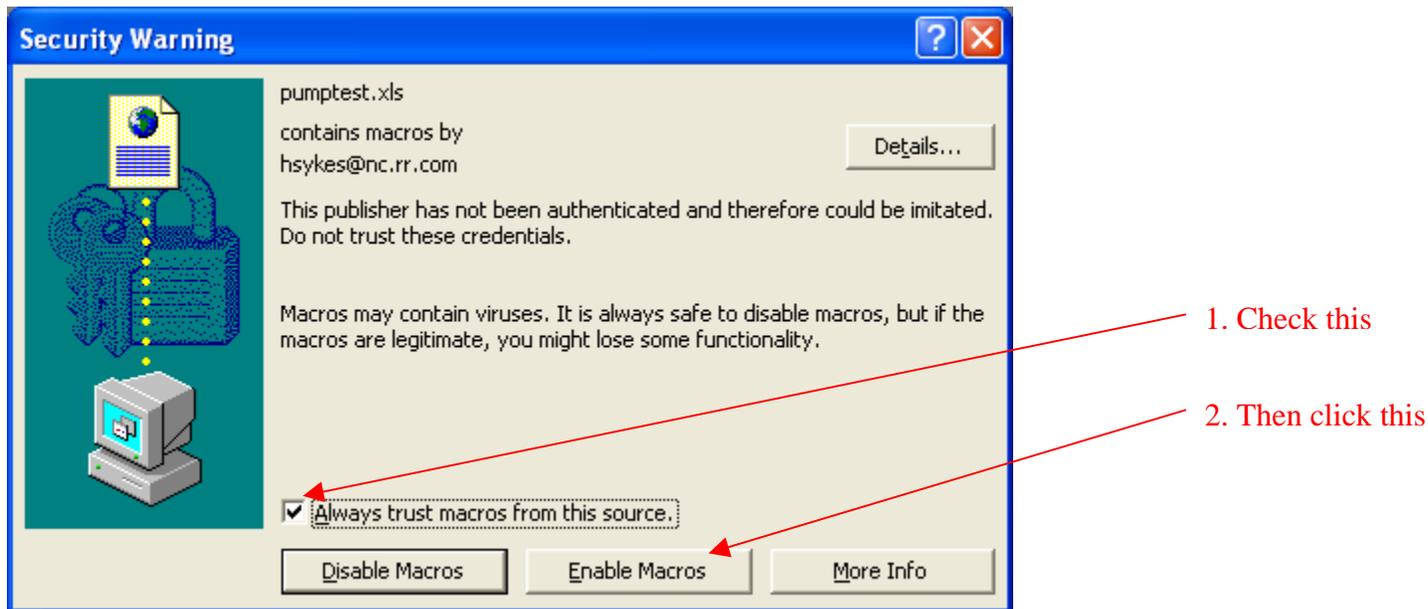


Figure 1

The spreadsheet is shipped with data from a sample test so you can see what your results should look like. Some of these values should be changed to values applicable to your environment: specifically, the tester’s name, location where your tests are run and the type of instrument used for your counter measurements. These items are shown in [Figure 2](#) as item numbers 1 (worksheet cell C21), item 3 (worksheet cell F21) and item 4 (worksheet cell G23) respectively. Note: The text for many of these items is allowed to occupy multiple worksheet cells. *You should enter the complete value in the leftmost cell of the selected group.*

	A	B	C	D	E	F	G	H	I	J	K	L	M
1			Click to Reset Annual Data			Click to Reset All Data			Print Report				
8	Fire Department Fire Apparatus Service or Acceptance Test												
10	Manufacturer:	Emergency One		Unit No.:	1	Model Yr.:	2002		Department:	My Fire Department			
11	Manufacturer's Model:	Pumper 44 (Typhoon)			Manufacturer's Serial No.:	123456		VIN:	4EN6AAA8021003456				
12	Engine Make:	Cummins		Model:	ISL 400	BHP:	400	at	2200	RPM:	2330	Governed RPM:	
13	Pump Make:	Hale	Model:	QMAX150-23		Stages:	1	Torque:	1200	Ft Lbs at:	1300	RPM:	
15						150 PSI	200 PSI	250 PSI					
16			Counter Ratio:			10 : 1	10 : 1	10 : 1					
17			Gear Ratio: Engine to Pump			2.28 : 1	2.28 : 1	2.28 : 1					
18			Transmission Gear Used			D	D	D					
19			Test Requirements (in GPM)			1500	1050	750					
21	Run by:	Howard Sykes		Tested at:	Their Fire Department, Any Street, Durham, NC						Date:		
22			Air temp:	81	Pressure:	30.15	Water temp:	78					
23	Counter Speed Checked Readings Taken From:	Veedee Root 6611		Engine Speed Test:	2300								
24	Suction Size:	6	inches	Length:	16	feet	Lift:	3.33	feet	1250	gallon booster tank		
25	Dry Vacuum test:	8	inch drop in 5 minutes	Time to obtain suction:	33	seconds (water flow)							
26	Tank flow test:		seconds	0	gallons flowed at:	508	GPM	Tip size:	5				
27	Tank flow test:	700	GPM	maximum flow rate measured with a	1.5	Tip size	5						
29	HOSE LAYOUT:	Two lines of 2-50' sections + two 1-50' sections 2.5"											
30		Digital Counter	Engine Counter	Speed from counter	App. Tach. Speed	Pump Pressure Appar. Gauge	Per NFPA 1911: Gauge and Flow Meter test: If the gauge's reading is off by more than 10 psi, repair is needed.			Tip size	Pressure	Pressure	Pressure
31	Time	Start	Stop	Speed	Speed	Gauge	Test Gauge	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure
32	15:11		130	2964	1300	1325	149	145	5.5	150.5	81	1506	
33	15:16		131	2987	1310	1329	149	145	5.5	150.5	81	1506	

Figure 2

The spreadsheet program will automatically enter values for your hose layout, tip size, needed pitot reading, etc., based on the size pump you are testing. Some of these values may vary between testers based on their available equipment. For example, you might use a slightly larger tip size with a lower pitot reading for the same GPM test or you might use a different number of hoses, hose diameter and hose length based on your test location. To avoid the need to always retype this information, the base information is provided in a table which you can update as required to match your test environment and equipment. The spreadsheet is provided with typical values already filled out as shown in [Figure 3](#)

	BA	BB	BC	BD	BE	BF	BG	BH	BI
9									
10	Pump_Sz	psi150tip	np150	gpm150	psi150hose	psi200tip	np200	gpm200	psi200hose
11	500	1.5	58	508	One 50' section of 2.5" hose	1.25	58	350	One 50' section of 2.5" hose
12	750	1.75	68	757	Two lines of 2-50' sections 2.5" hose	1.5	64	532	One lines of 2-50' sections 2.5" hose
13	1000	2	70	1003	Three lines of 2-50' sections 2.5" hose	1.75	58	701	Two lines of 2-50' sections 2.5" hose
14	1250	2.25	70	1260	Two lines of 2-50' sections + one 1-50' sections 2.5" hose	1.875	74	880	Two lines of 2-50' sections 2.5" hose
15	1500	2.5	81	1506	Two lines of 2-50' sections + two 1-50' sections 2.5" hose	2.125	64	1056	Two lines of 2-50' sections + one 1-50' 2.5" hose
16	1750	2	53	1760	Four lines of 2-50' sections 2.5" hose	1.75	46	1254	Four lines of 2-50' sections 2.5" hose
17	2000	2	70	2006	Four lines of 2-50' sections 2.5" hose	1.75	58	1402	Four lines of 2-50' sections 2.5" hose

Figure 3

The changeable values for this table start at worksheet cell BB11. To get to this location, use the spreadsheet horizontal scroll bar and scroll to the right. **The information in this table should be reviewed and changed it if you use different tip sizes or hose layouts.**

You should now save the spreadsheet. The values you have set so far, such as your name, are never reset with the assumption that each person running these tests has their own copy of the spreadsheet on their computer. If you do need to change a value (like if you run a test at another site) you can just type over the stored value with the current information.

Operational Features

Three macro buttons (shown on worksheet line 2 in [Figure 2](#)) are provided to simplify the management of the spreadsheet data. The first “Click to Reset Annual Data” erases all of the data that needs to be entered each time the service test is run, such as the gauge readings. It does not change vehicle specifications, such as model numbers and gear ratios, thus saving the need to re-key that

information next time the apparatus is tested. This button should be clicked prior to entering data for a new service test of an apparatus that has previously been tested. After this button has been pressed, some calculated values such as averages will display as errors. This is normal since the program cannot create an average until values are entered. Once new data is entered the correct calculated values will again display.

The “Click to Reset All Data” button resets all of the annual data and also resets vehicle specific data. This button should be pressed prior to running a service test on an apparatus which you have not previously service tested.

The “Print Report” button can either print a blank form for data collection or a completed form for filing. It should be pressed either after pressing one of the “Reset” buttons or after all data has been entered. It will handle necessary reformatting and print a report on your default printer for fire department records. Part of this reformatting includes suppressing the printouts of any optional tests which were not executed.

While this spreadsheet can be most useful when data is entered on a laptop as the test is run, it can also be used to create and print blank forms to be filled out during a test for later entry into the computer and printing a final report. Blank forms may be printed out with either the apparatus information already filled in (in which case you will see which hose lays to use and what the required pitot readings are. It can also be printed with all information blank.

Where possible values can be selected from a list (such as the pump size cell F19 and pump make cell C13). Selecting these cells will display a pull-down arrow which will allow you to select valid values from the list.

The spreadsheet contains a number of features to help with your data entry and ensure that your completed test contains the correct information. All cells where a value should be entered but has not yet been entered will display with a light yellow background color. Item number 9 (worksheet cell M21) in [Figure 2](#) shows this background. The use of background colors is designed to help you make sure that you have not forgotten to collect a piece of data that is needed for the test.

Cells for optional data will appear with a cyan background color until they have been filled in. If you do not fill in these optional values, they will automatically be omitted from your printed output when the “Print Report” button is pressed. Item number 2 (worksheet cell D26) in [Figure 2](#) shows this background and the optional “Tank flow test” will not print if the value is omitted. NOTE: Do not delete this line from the spreadsheet even if you never run this test. Just leave the value blank and let the report printing program handle it.

The spreadsheet contains a number of hints, tips and operational procedure abstracts so that you will not normally need to refer back to the NFPA standards while entering test data. All cells that contain a small red triangle in the upper right hand corner (such as worksheet cell G30 or item number 5 in [Figure 2](#)) contain fly-over text. Simply positioning the mouse over this cell causes the fly-over text to display. Item 6 in [Figure 2](#) is the fly-over text for worksheet cell G30.

Selecting various cells will cause information about that cell to be displayed automatically. For example, selecting worksheet cell K25 or item number 7 in [Figure 2](#) will cause the automatic display of the text shown in item number 8 in [Figure 2](#).

Many of the values you enter are also checked for reasonableness. For example, if a value of 12 was entered in cell D25 for the dry vacuum drop, the pop-up shown in [Figure 4](#) will be displayed. If you click OK, the value will be saved. Even though this indicates the test failed (which the popup reminded you of) you would want to be able to record this reading if that was in fact how this apparatus performed. If you click Cancel, the cell will be reset to its prior value. This would be helpful if the value was miskeyed or you were making a correction and rerunning the test.

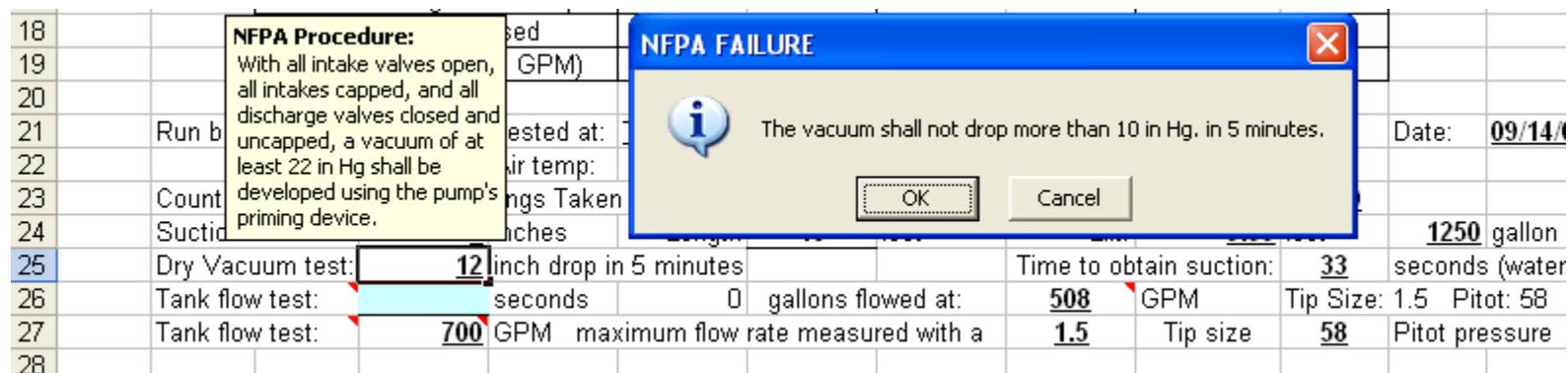


Figure 4

The spreadsheet also handles two different methods of performing tank flow tests (shown in [Figure 4](#) rows 26 and 27). The first determines how many gallons can be flowed at the required flow rate. This is the style test described in NFPA 1901. It does not

determine the maximum possible flow rate but does confirm what percentage of the tank can be flowed at the tested flow rate. The second method determines what is the maximum possible flow rate that can be achieved from the booster tank but does not let you know how long that rate can be maintained. This style test is described in NFPA 1911. You may use either both or neither (remember NFPA says a tank flow test is required.)

Support

Questions and suggestions on the use of this spreadsheet should be sent to Howard Sykes via e-mail to hsykes@nc.rr.com. This may be done by clicking on the preceding e-mail address.