

Length		<ol style="list-style-type: none"> Select (insert) mode: 'ATTACK' vs. 'OVERHAUL' Pull insert "OUT" to current Hoselay Length in feet. Rotate DIAL "A" to TOTAL of Nozzle Pressure (NP) + Friction Loss (FL) upon number of "Laterals" operating row by the Nozzle FLOW (NFPA 1002) @ (20/60C or 25/75C GPM 'ATTACK') column to LEFT. Again rotate DIAL "A" until estimated (+) HEAD (in FEET) lines up with TOTAL of #3 (NP + FL) Read estimated ENGINE PRESSURE (EP) upon RED NEEDLE of Dial "A" on 'Fixed' GAUGE "B" 	
Attack			
Overhaul			
Max HEAD			
Max Grade			
Max GPM			
Max GPH			
Laterals			
7			
6			
5			
4			
3			
2			
1			
0			

Laterals Operating

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Note: **TOTAL** Friction Loss (FL) is calculated upon **10** GPM Laterals w/ **10/23** or **10/30** Comb. Nozzles

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HFT-FIRE

"Is not Friction Loss a direct mathematical function of Gallons Per Minute?" Each individual (GPM) affected section of hose is subject to: [Friction Loss (FL) = (GPM/100)² * C * L/100'] (SDTDC-2005: "C" for 1.5" hose is 35 and 1" is 250) On a 32% Grade, the **Standard** method **MUST STOP** at 600' before exceeding **MAX 400 PSI**; at 1,100', pump **DOWNHILL -288'** The '**HENWAY**' pumps **25% more** at 75 GPM (**50% more effective**) @ **500'** /83% **FARTHER** and **639'** **HIGHER HEAD** for **SAFETY!**

75C	Standard			Length	75C	Standard			Length	75C	HEN-WAY			Length
	GPM	FL	Lat.			GPM	FL	Lat.			GPM	FL	Lat.	
	75	19.7	2.5	1,000'		75	19.7	2.5	1,000'		75	19.7	2.5	1,000'
	75	19.7	2.5	800'		85	25.3	2.5	800'		43	6.3	2.5	800'
	85	25.3	2.5	600'		85	25.3	2.5	600'		43	6.3	2.5	600'
	85	25.3	2.5	400'		95	31.6	2.5	400'		53	9.6	2.5	400'
	95	31.6	2.5	200'		95	31.6	2.5	200'		53	9.6	2.5	200'
	95	31.6	2.5	0'		105	38.6	2.5	0'		53	9.6	2.5	0'
	105	38.6	2.5	0'		105	38.6	2.5	0'		63	13.7	2.5	0'
	105	38.6	2.5	0'		115	46.3	2.5	0'		63	13.7	2.5	0'
	115	46.3	0	0'		115	46.3	2.5	0'		73	18.4	0	0'
	115	46.3	0	0'		125	54.7	0	0'		73	18.4	0	0'
Total: 323 10				Total: 413 12.5				Total: 135 12.5						
(+19.7 PSI/+6%) FL: 333 Only				(+90 PSI/+28%) FL: 425 TOTAL				(-288 PSI/-67%) FL: 148 TOTAL						
Nozzle Pressure (NP): 100 5%				Nozzle Pressure (NP): 100 21%				Nozzle Pressure (NP): 100 53%						
TOTAL (before 'HEAD'): 433 More				TOTAL (before 'HEAD'): 525 More				TOTAL (before 'HEAD'): 248 LESS						
Avail. Pressure to 400: -33 MAX				Avail. Pressure to 400: -125 MAX				Avail. Pressure to 400: 152 639'@						
Max. HEAD in Feet: -76 -8%				Max. HEAD in Feet: -288 -13%				Max. HEAD in Feet: 351 32%						
Max. Length @ 32% Grd.: 600 Grd.				Max. Length @ 32% Grd.: 600 Grd.				Max. Length @ 32% Grd.: 1100 +83%						

"HEN-WAY" 29 CFR 1910.156(c)(1) & (2) NFPA 1002/1041 **REQUIRES YOU to STOP at 400 PSI!** - **FIREFIGHTER SAFETY** -

"NP" and "FL" ("A" is 'NUL') Pressure Losses are one (1) variable for up to all laterals **flowing simultaneously** in both '**ATTACK**' vs. '**OVERHAUL**' modes. The remaining pressure **LESS** from the **MAX 400 PSI** when divided by 0.434 PSI/ft. determines the **MAX** (±) **HEAD**; % Grade then verifies the **MAX Length**.

Use '**OVERHAUL**' inserts **AFTER containment**. **ALL** pressures are '**Color-Coded**' to indicate you're in the **DANGER ZONE** if '**ATTACK**' **PRESSURES** are required for an **ESCAPE** or severe **BLOW-UP!**

AFTER connected; (radio) **CONFIRM!** **RULE OF THUMB:** **Install** at any time Nozzle Pressure reduces; **STOP** at **MAX 400 PSI** (EP)

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DO THE MATH!

This is a 1,000' hoselay as illustrated:

There are eight (8) contour lines.

Each contour line is 40 feet INCREASED elevation.

Eight (8) times (X) 40'/contour line = 320'

320' over a 1,000' run is a 32% Grade

320' times 0.434 PSI/ft. = 139 PSI HEAD pressure.

Per NFPA 1002, 139 PSI HEAD pressure LOSS [PLUS TOTAL (FL) AND (NP)] MUST BE COMPENSATED at the pump for SAFETY!

The Standard method must STOP at 600' on a 32% Grade upon utilizing 75 GPM /10 GPM nozzles for HEAVY FIRE ATTACK for far BETTER PROTECTION and EFFICIENCY to INCREASE FIREFIGHTER SAFETY!

Upon extending only 100' from 900' feet to 1,000', FL increases by only 19.7 PSI or 6%...

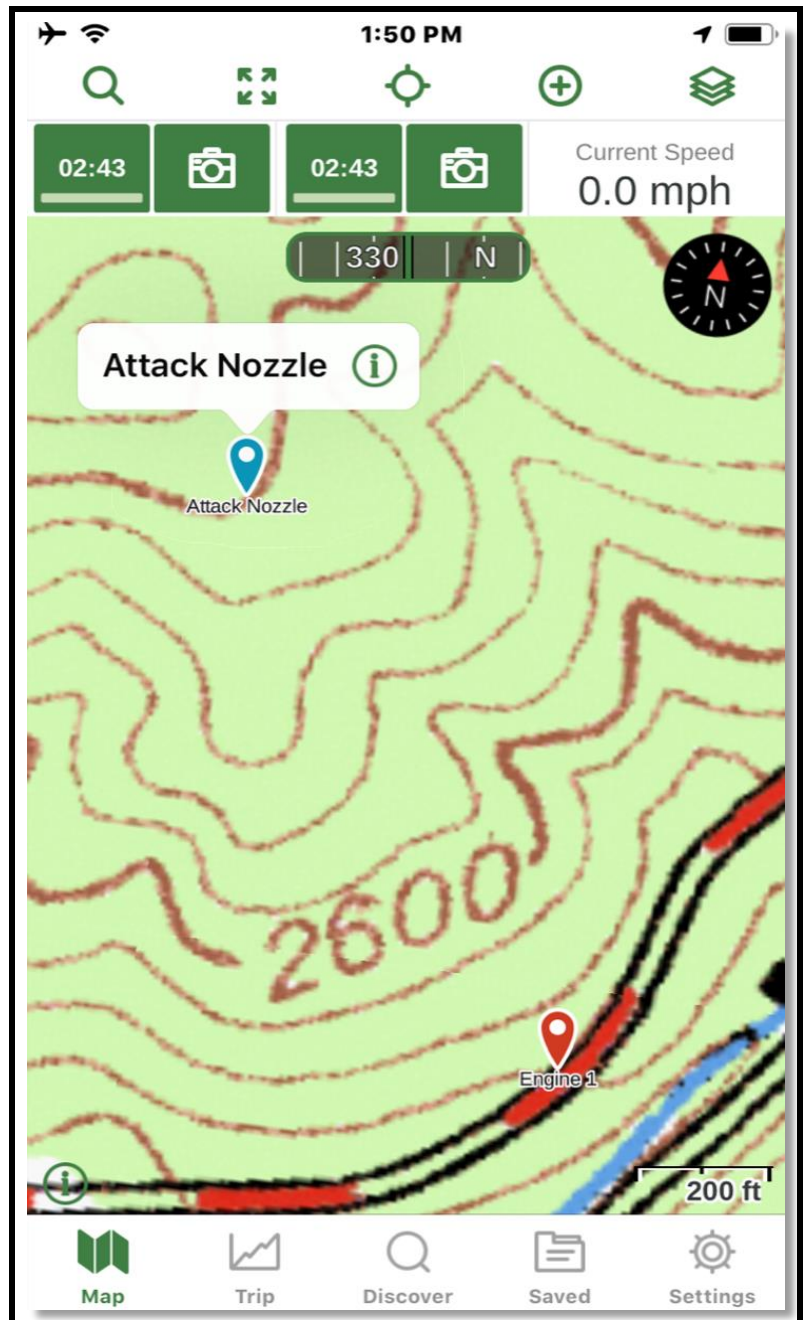
BUT when extending only 100' from 1,000' to 1,100', and therefore ADDING a FIFTH (5th) lateral at 10 GPM, the OVERAL FLOW from the Engine to the first lateral INCREASES from 115 GPM to 125 GPM, PLUS the Friction Loss (FL) of each AFFECTED section thereafter, to cause FL to INCREASE a FULL 90 PSI at 28%! The calculated evidenced increase in Friction Loss SHALL NOT EVER be disregarded EVER to ensure our highest priority: FIREFIGHTER SAFETY!

The HEN-WAY method, reduces the water flow (GPM) to supply the ATTACK nozzle and each Lateral thereafter by one-half (1/2); upon squaring this fraction of $1/2 \times 1/2 = 1/4$, Friction Loss in each INDIVIDUALLY AFFECTED SECTION is reduced by an INCREDIBLE:

75% LESS FRICTION LOSS!!!

Thus, a 75 GPM /10 GPM hoselay limited to 600' (at 25% MORE flow and therefore 50% MORE "KNOCK-DOWN" than 60 GPM) can be SAFELY EXTENDED an additional 500' (83% further) to 1,100' ...and yet a FULL 639' higher (351' uphill vs. -288' downhill) to significantly INCREASE FIREFIGHTER SAFETY!

Not only can we then extend another 400' to 1,500' at 25 GPM (150% farther) on a 32% Grade and flow 75 GPM in short bursts (balloon effect), but we can isolate/deploy any portion of the "Supply Line" for a slop-over/escape at 75 GPM (close next gated-we and ALL unnecessary laterals), AND meet the "Holy Grail" upon continuous resource 'Sit-Stat' simply by maintaining the same continuous communication with all personnel in the field.



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