Length	1100	
Attack	60C	75C
Overhaul	10/23C	10/23C
Max HEAD	431	351
Max Grade	39%	32%
Max GPM	110	125
Max GPH	6600	7500
	'NAY' after	
Laterals	' (5th Lat.)	
7		
6		
5	213	248
4	202	236
3	185	217
2	174	204
1	158	185
0	144	169

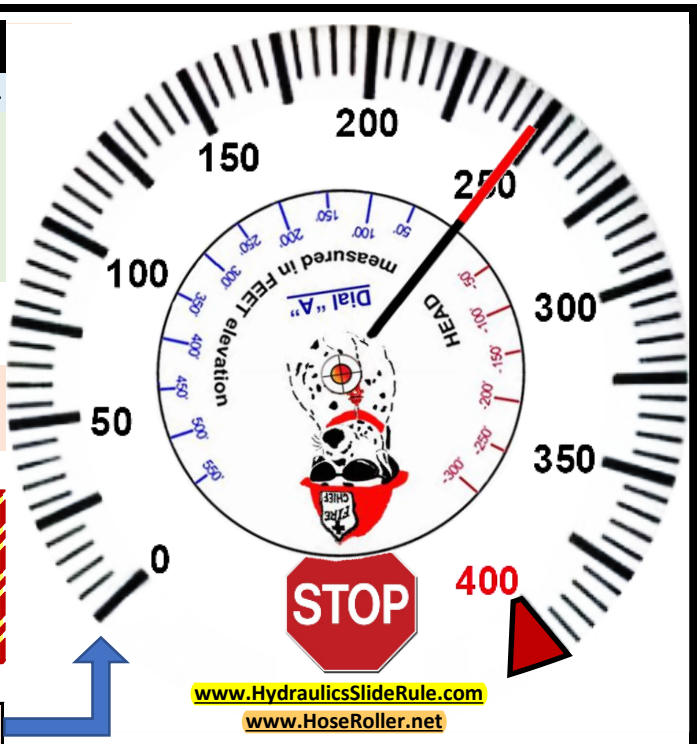
1. *Select* (insert) mode: 'ATTACK' vs. 'OVERHAUL'
2. *Pull* insert "OUT" to current Hoselay Length in feet.
3. *Rotate* DIAL "A" to *TOTAL* of Nozzle Pressure (NP) + Friction Loss (FL) upon number of "Laterals" operating row by the *Nozzle FLOW* *(NFPA 1002)* @ (20/60C or 25/75C GPM '*ATTACK*') column to LEFT.
4. Again *rotate* DIAL "A" until *estimated* *(+)* *HEAD* *(in FEET)* lines up with *TOTAL of #3* (NP + FL)
5. *Read* estimated *ENGINE PRESSURE* (EP) upon *RED NEEDLE* of Dial "A" on 'Fixed' GAUGE "B"

Laterals Operating

5

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

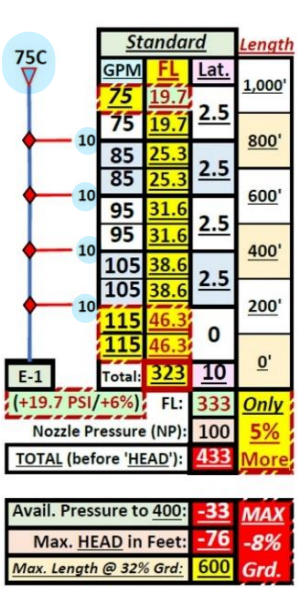
'Fixed' GAUGE "B"

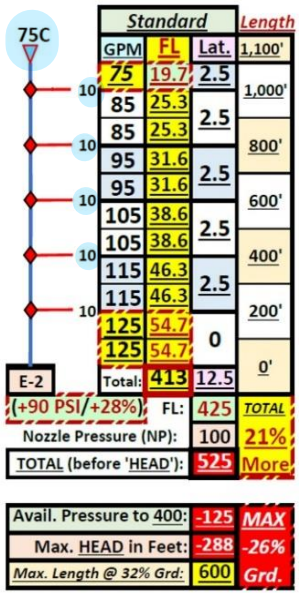


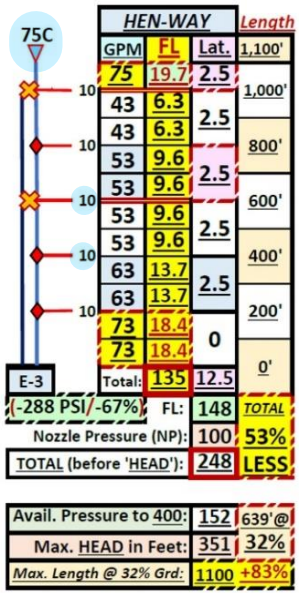
www.HydraulicsSlideRule.com
www.HoseRoller.net

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; or @ 1,100', pump DOWNHILL -288' The 'HENWAY' pumps 75 GPM (56% > 'Knock-Down' than 60 GPM) @ 500' /83% FARTHER and 639' MORE HEAD for SAFETY!*







" HEN-WAY "

Attack fire w/ one (1) 1.5" hose; lay '*Supply*' line dry. At 600', 1,000' & 1,400': *Attach* (2) Dbl. Females, a 'reversed' Gated-Wye, a Dbl. Male, an 1.5" X 1" Tee, and a Gated-Wye. *Charge* secondary 'Supply' line *ONLY AFTER* connected; (radio) *CONFIRM !* RULE OF THUMB: *Install* at any time Nozzle Pressure reduces; *STOP* at *MAX 400 PSI* (EP)

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 !*

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 'dual-hoselay' *HEN-WAY* method, reduces the *TOTAL* GPM to supply the ATTACK nozzle and each Lateral by one-half (1/2); thus the square of the fraction (GPM/100) is 1/2 X 1/2 = 1/4; Friction Loss in each *AFFECTED* SECTION is therefore reduced by an INCREDIBLE:

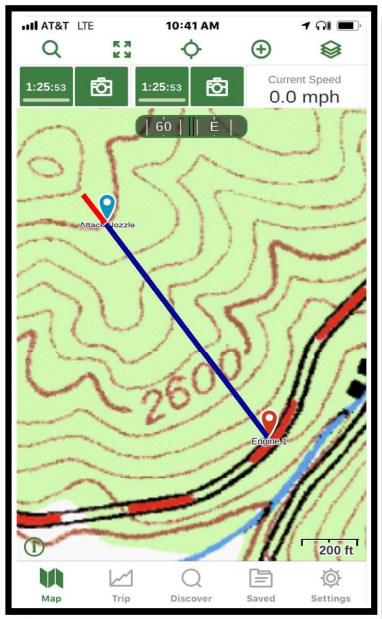
75% *LESS* FRICTION LOSS!!!

Thus, a 75 GPM /10 GPM hoselay limited to 600' (at 25% MORE flow and therefore 56% 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!

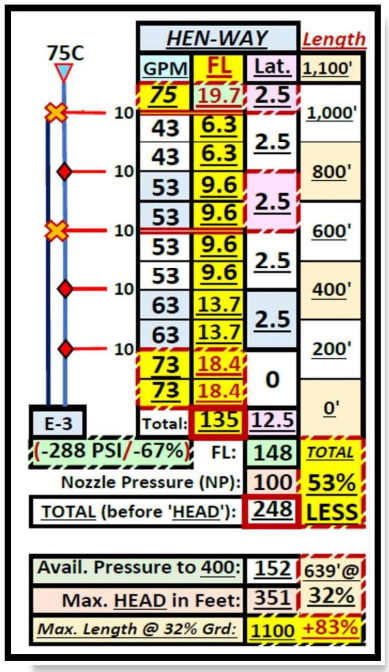
Not only can we then extend another 400' to 1,500' at 25 GPM *(150% farther)* on a 32% Grade flowing *75 GPM in short bursts* (balloon effect), but we can also isolate (w/ hose clamps) and deploy/extend any portion of the *'Supply Line'* as we suspend the main 'Attack' nozzle and ALL unnecessary laterals to quickly *ATTACK* any *'ESCAPE'* at FULL *75 GPM flow !* - *1,066% SAFER 'Knock-Down' than any 10/23 GPM lateral!* The "Holy Grail" of Wildland Firefighting is finally met upon confirmed personnel accountability and location; critical to estimate (+) or (-) HEAD that exponentially fulfills PRIORITY ONE: *PERSONNEL SAFETY!*

Get the APP that this technology is perfectly matched for at:
https://GAIAGPS.com
Instructional videos: **http://video.hydraulicsapp.com**

HFT Fire *'TOTAL'* Engine Pressure Slide-Rule Calculator

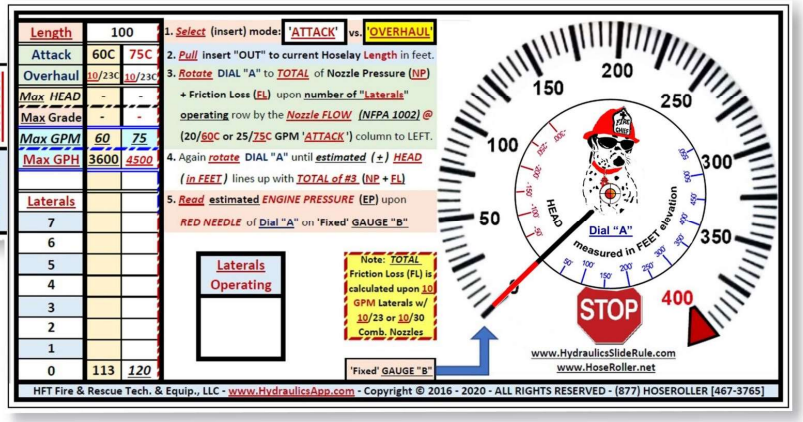


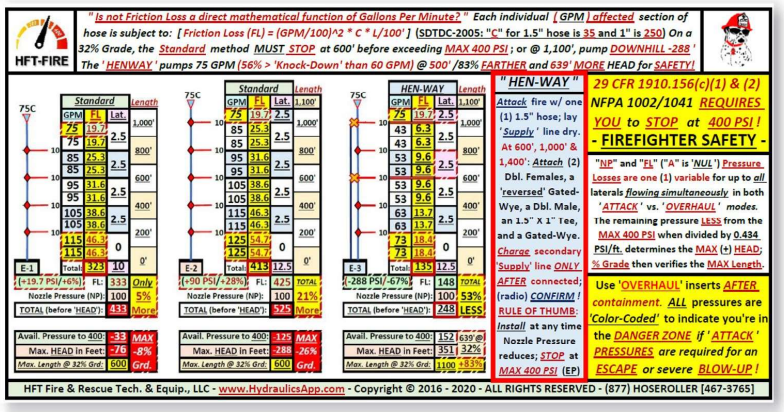
The Scenario

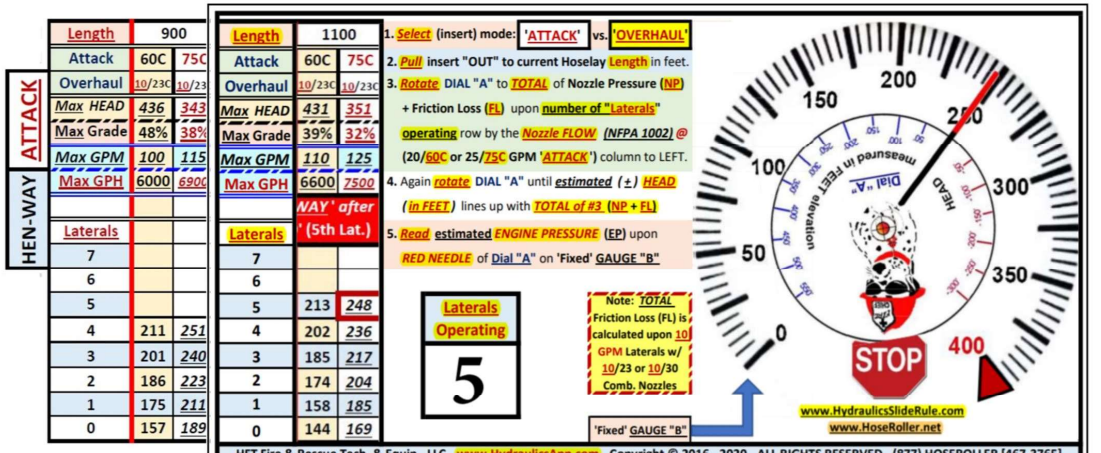


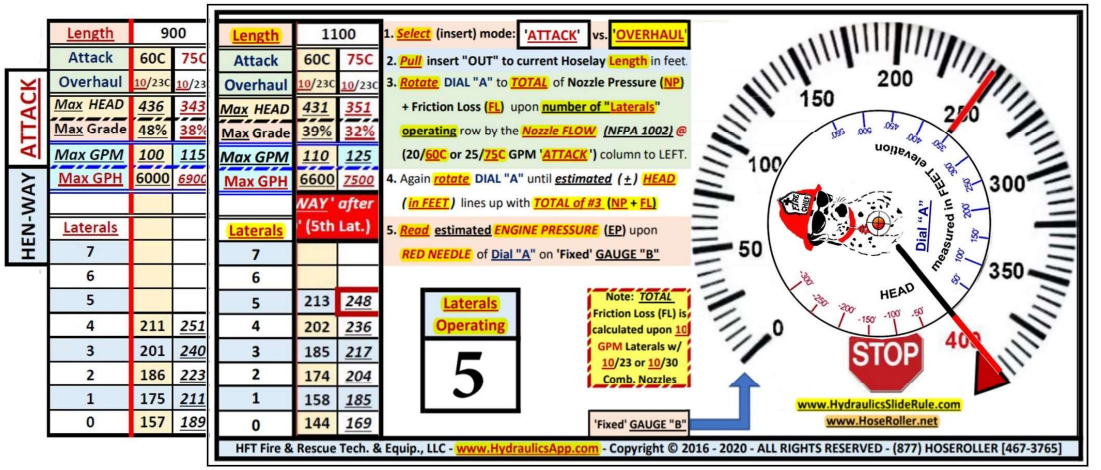
'HENWAY' at 248 PSI

1. ***Select*** ***'HENWAY'*** or ***'Standard'*** method.
2. ***Extend*** insert to current hoselay Length **(i.e. 1,100' at 75 GPM)**
3. ***Determine*** **NP + FL** per number of laterals operating. **(i.e. "5" Lat.)**
4. ***Rotate*** **Dial "A"** **(i.e. 248 PSI on flat ground)**
5. ***Count*** the 40' contour lines on a USGS map to estimate elevation. **(i.e. 8.75 X 40' ~ 350')**
6. ***Rotate*** **Dial "A"** until **HEAD** in feet lines up with **FL + NP** of **Step 4.** **(i.e. EP = MAX 400 PSI)**









FIVE (5) variables to perform ALL calculations: (1) Year of Coefficent; (2) ATTACK nozzle flow (GPM);
(3) HEAD in FEET; (4) LATERAL nozzle flow (GPM); (5) "T" for TIP (50 PSI); "C" for Combination nozzle (100 PSI)

'Standard' vs. 'HENWAY.org'

Coef. (Yr)	2021
1.5"	35
1"	250

'Hoffmann's Extraordinary New-WAY'

Attack GPM:	75
HEAD ft.:	350
PSI:	152
Lat. GPM	10
T or C? >	Comb
(NP) PSI:	100

75

GPM	FL	Lat (FL)	
75.0	19.7	2.5	1200'
75.0	19.7		
42.5	6.3	2.5	1000'
42.5	6.3		
52.5	9.6	2.5	800'
52.5	9.6		
52.5	9.6	2.5	600'
52.5	9.6		
62.5	13.7	2.5	400'
62.5	13.7		
72.5	18.4	0	200'
72.5	18.4		0
Total:	154.7	12.5	

REAL-TIME	Eng-1
Tip	Comb
369	419

EXTRA Pressure (for HEAD): 277.5

HFT-FIRE

[Before (Additional) HEAD]

125 Laterals	1100 PSI	1200 PSI	△ to 400 PSI	1100 Ft. Elev.	@400 PSI % Grade	More Efficient Elev. △	More Efficient Grd. △	Dist. △ @ 1,200'
5	399	419	1	1	0.1%	639	58.1%	400' @33%
4	388	407	12	29	2.6%	622	56.6%	
3	369	389	31	72	6.5%	589	53.5%	
2	356	376	44	102	9.2%	516	46.9%	
1	337	357	63	144	13.1%	437	39.7%	
0	321	340	79	182	16.6%	340	30.9%	

Coef. (Yr)	2021
1.5"	35
1"	250

'Standard' Deployment Method

Attack GPM:	75
HEAD ft.:	350
PSI:	152
Lateral GPM:	10
T or C? >	Comb
(NP) PSI:	100

75

GPM	FL	Lat (FL)	
75.0	19.7	2.5	1200'
75.0	19.7		
85.0	25.3	2.5	1000'
85.0	25.3		
95.0	31.6	2.5	800'
95.0	31.6		
105.0	38.6	2.5	600'
105.0	38.6		
115.0	46.3	2.5	400'
115.0	46.3		
125.0	54.7	0	200'
125.0	54.7		0
Total:	432.3	12.5	

REAL-TIME	Eng-2
Tip	Comb
647	697

[Before (Additional) HEAD]

125 Laterals	1100 PSI	1200 PSI	△ to 400 PSI	1100 Ft. Elev.	@400 PSI % Grade
5	677	697	-277	-638	-58.0%
4	658	677	-258	-594	-54.0%
3	624	644	-224	-517	-47.0%
2	580	600	-180	-414	-37.7%
1	527	547	-127	-293	-26.6%
0	468	488	-68	-158	-14.3%

These results are at 1,100' on a 32% Grade ot match poster.