Multi-Turn Valve Torque & Thrust Calculator

(For Globe and Knife Gate Valves)

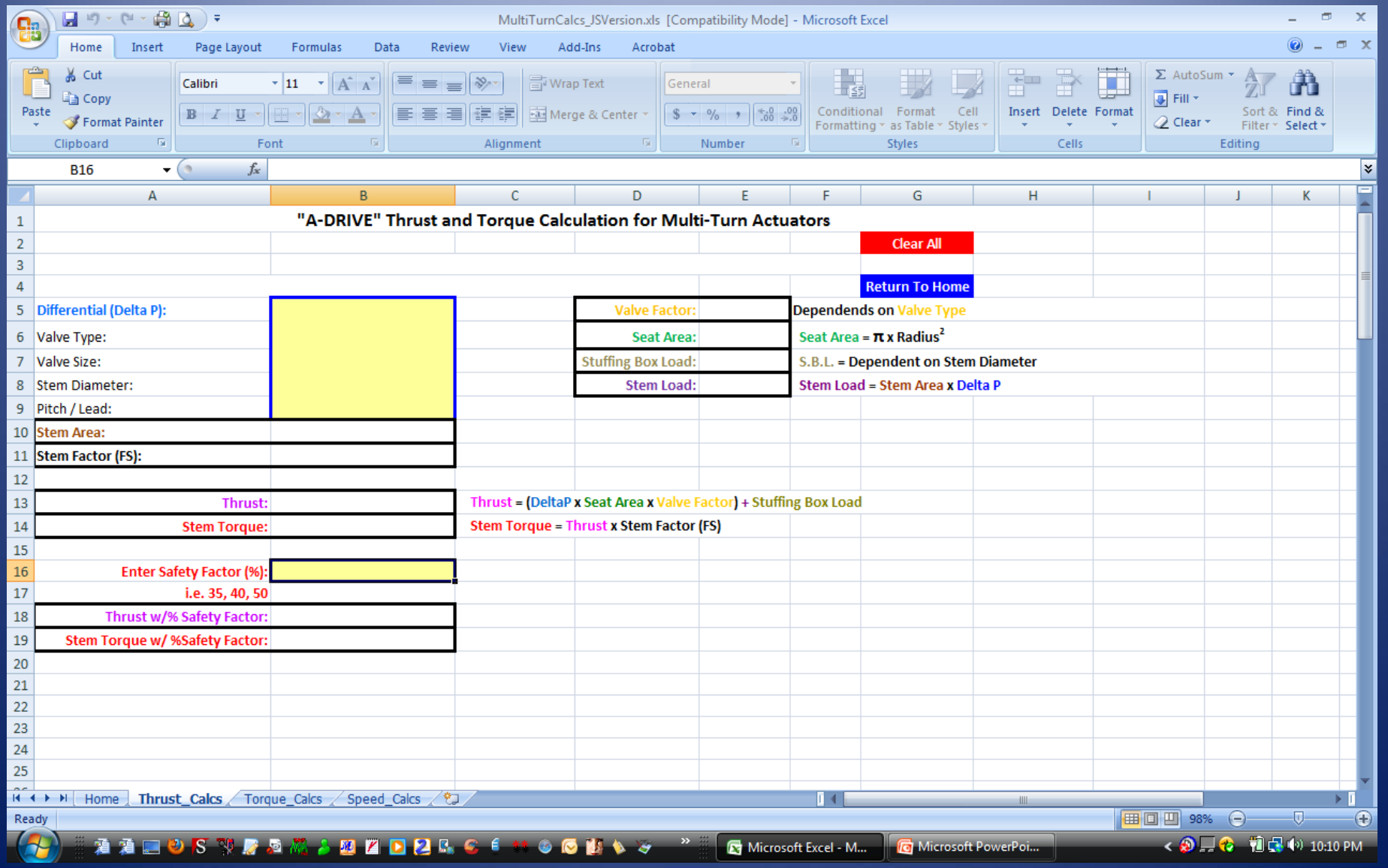
by Jay Schwausch

To maneuver through this presentation…

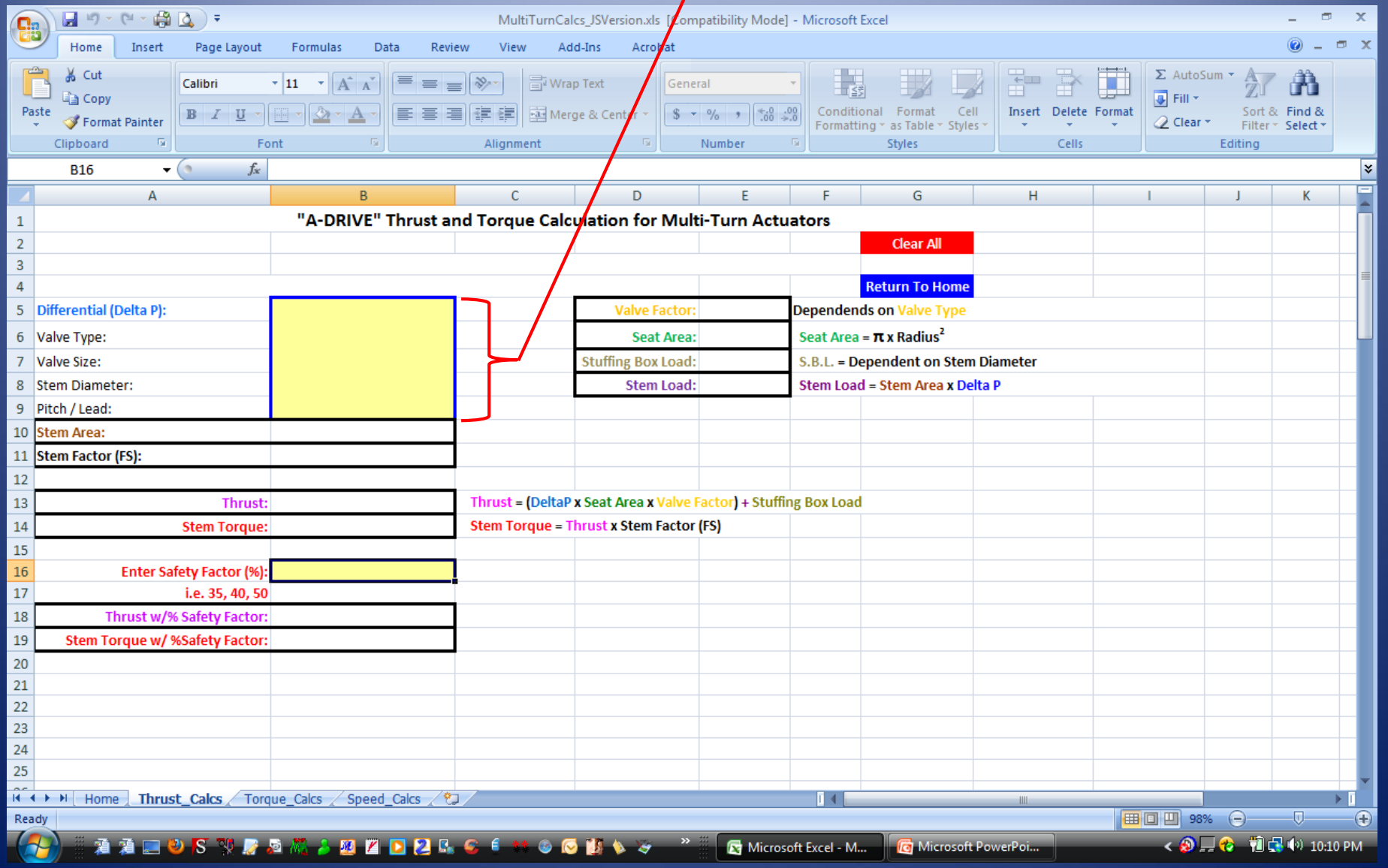
Hit your keyboard's right arrow key ▶ to go forward

Hit your keyboard's left arrow key ◀ to step backward.

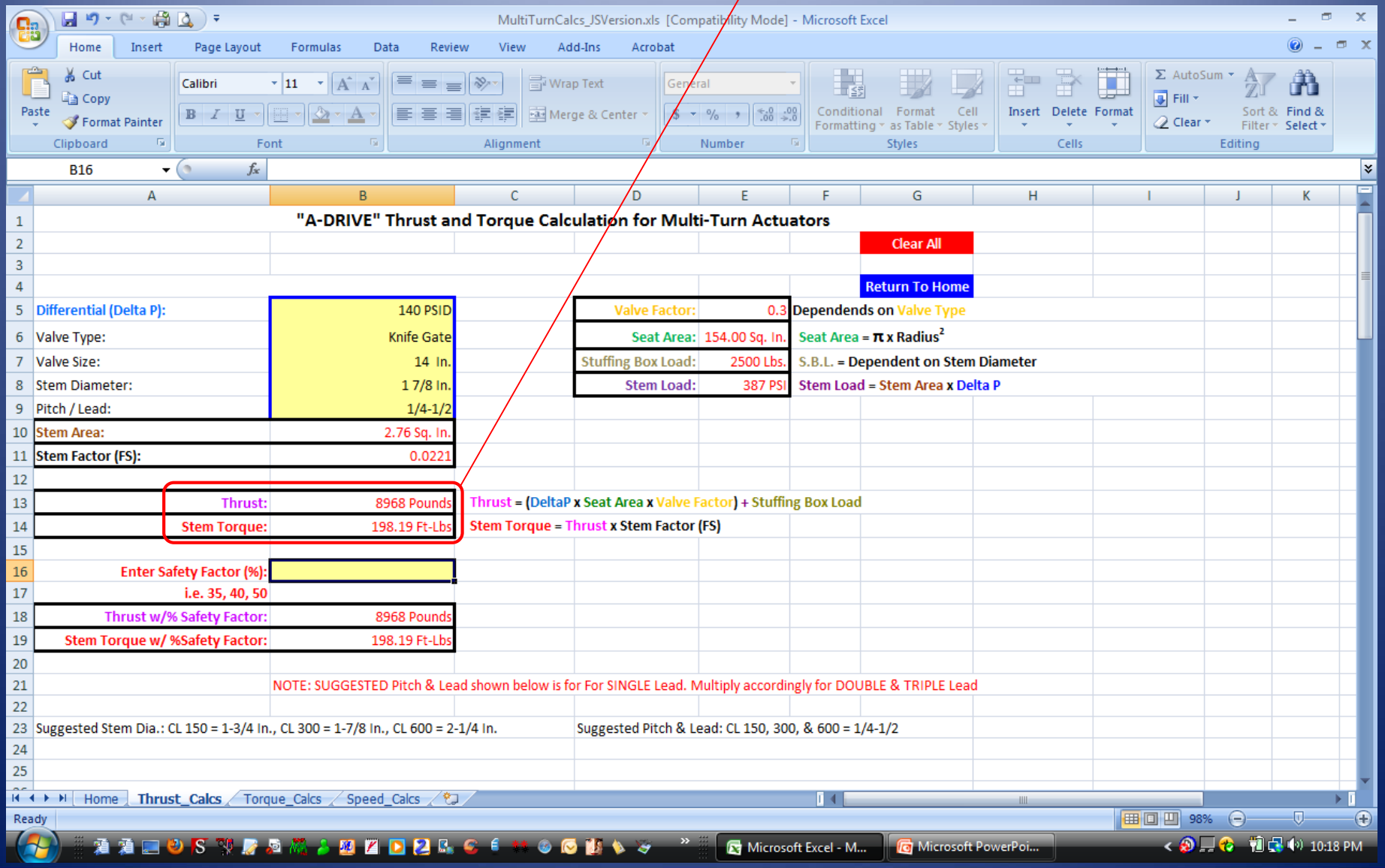
User Friendly:
"MS Excel" Based Program



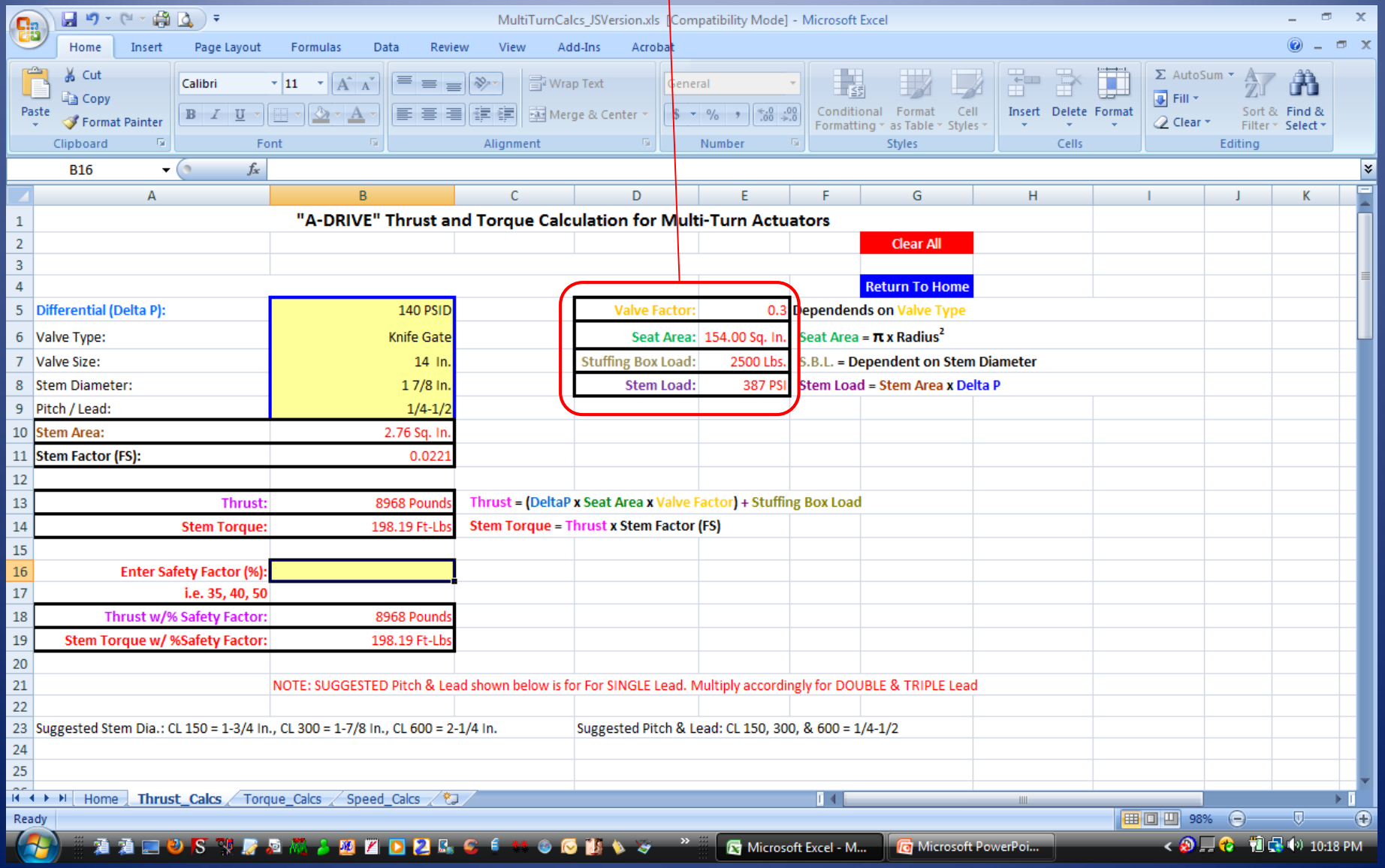
Simply fill in 5 blanks…
and all the work is done for you!



Thrust and Stem Torque values both are calculated!



Valve Factor, Stem Area, Stuffing Box Load and Stem Load all a pain to deal with???



MultiTurnCalcs_JSVersion.xls [Compatibility Mode] - Microsoft Excel

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"A-DRIVE" Thrust and Torque Calculation for Multi-Turn Actuators

Clear All

Return To Home

Differential (Delta P):	140 PSID	
Valve Type:	Knife Gate	
Valve Size:	14 In.	
Stem Diameter:	1 7/8 In.	
Pitch / Lead:	1/4-1/2	
Stem Area:	2.76 Sq. In.	
Stem Factor (FS):	0.0221	
Thrust:	8968 Pounds	Thrust = (DeltaP x Seat Area x Valve Factor) + Stuffing Box Load
Stem Torque:	198.19 Ft-Lbs	Stem Torque = Thrust x Stem Factor (FS)
Enter Safety Factor (%):		
i.e. 35, 40, 50		
Thrust w/% Safety Factor:	8968 Pounds	
Stem Torque w/ %Safety Factor:	198.19 Ft-Lbs	

Valve Factor:	0.3	Dependends on Valve Type
Seat Area:	154.00 Sq. In.	Seat Area = π x Radius^2
Stuffing Box Load:	2500 Lbs.	S.B.L. = Dependent on Stem Diameter
Stem Load:	387 PSI	Stem Load = Stem Area x Delta P

NOTE: SUGGESTED Pitch & Lead shown below is for For SINGLE Lead. Multiply accordingly for DOUBLE & TRIPLE Lead

Suggested Stem Dia.: CL 150 = 1-3/4 In., CL 300 = 1-7/8 In., CL 600 = 2-1/4 In.

Suggested Pitch & Lead: CL 150, 300, & 600 = 1/4-1/2

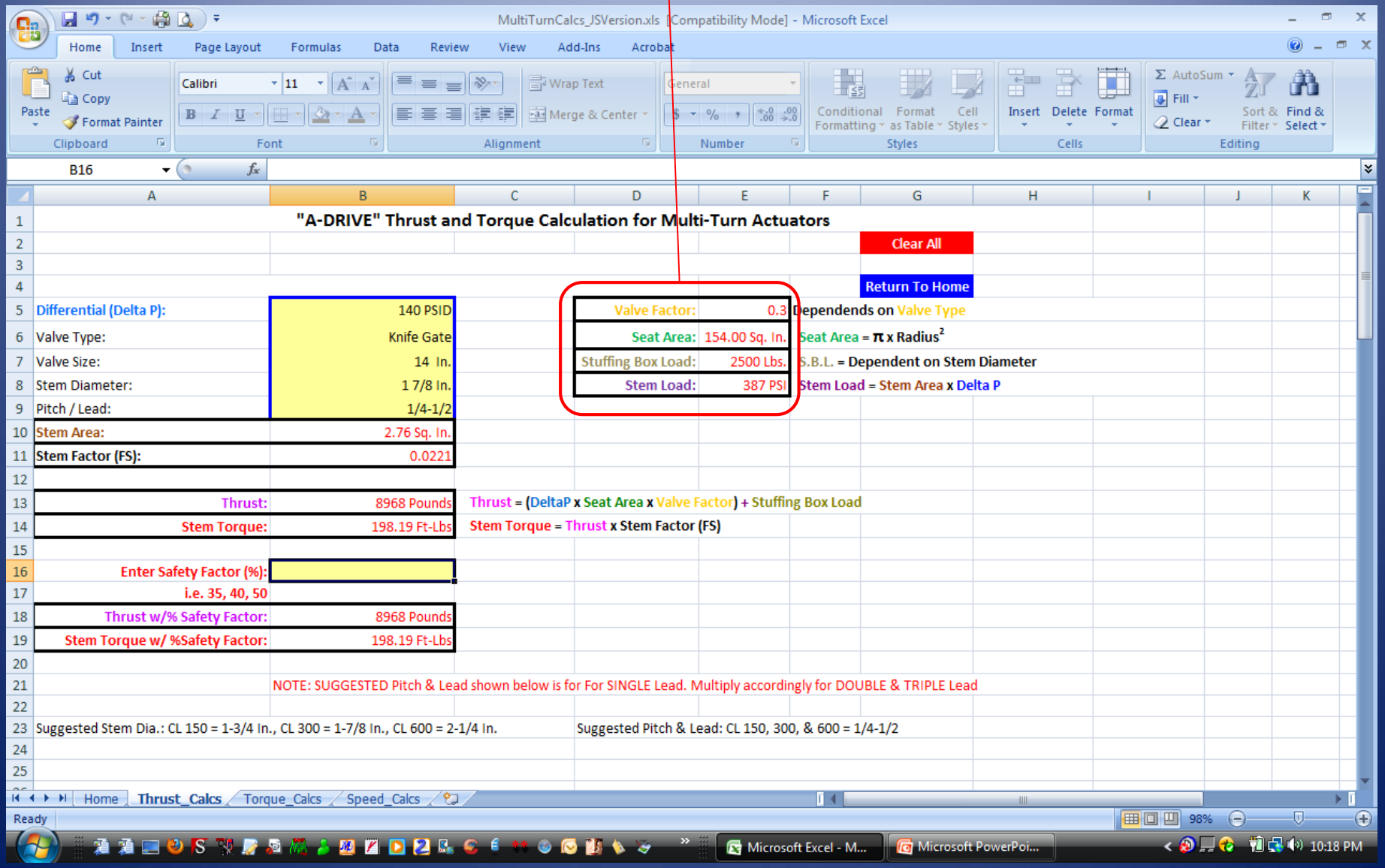
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Ready

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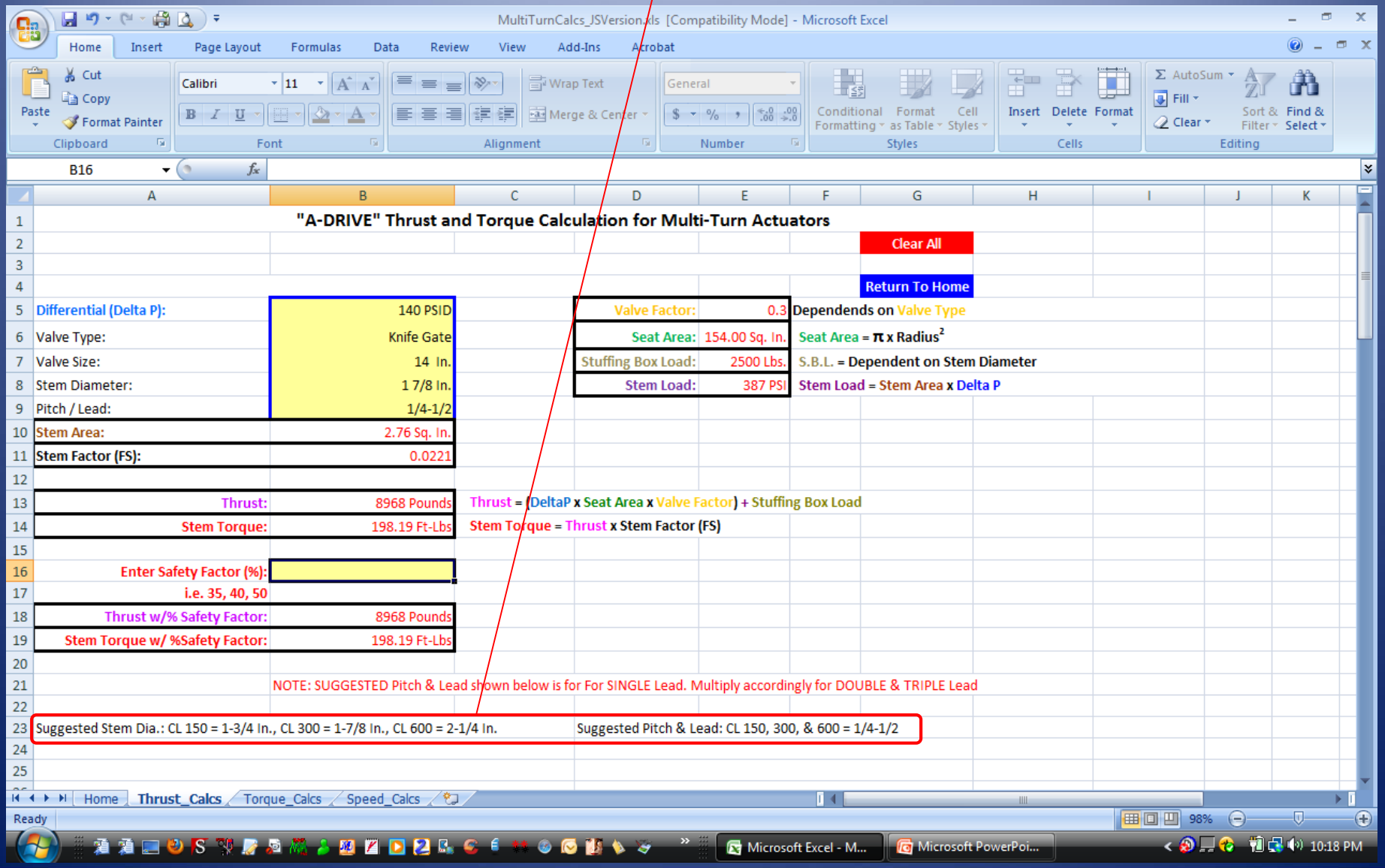
These are all provided/calc'd for you!

(Eliminating common human error!)



Unsure of Stem Diameter & Pitch/Lead?

(These values are suggested!)



MultiTurnCalcs_JSVersion.xls [Compatibility Mode] - Microsoft Excel

"A-DRIVE" Thrust and Torque Calculation for Multi-Turn Actuators

Clear All

Return To Home

Differential (Delta P):	140 PSID	Valve Factor:	0.3	Dependends on Valve Type	
Valve Type:	Knife Gate	Seat Area:	154.00 Sq. In.	Seat Area = π x Radius^2	
Valve Size:	14 In.	Stuffing Box Load:	2500 Lbs.	S.B.L. = Dependent on Stem Diameter	
Stem Diameter:	1 7/8 In.	Stem Load:	387 PSI	Stem Load = Stem Area x Delta P	
Pitch / Lead:	1/4-1/2				
Stem Area:	2.76 Sq. In.				
Stem Factor (FS):	0.0221				
Thrust:	8968 Pounds	Thrust = (DeltaP x Seat Area x Valve Factor) + Stuffing Box Load			
Stem Torque:	198.19 Ft-Lbs	Stem Torque = Thrust x Stem Factor (FS)			
Enter Safety Factor (%):					
i.e. 35, 40, 50					
Thrust w/% Safety Factor:	8968 Pounds				
Stem Torque w/ %Safety Factor:	198.19 Ft-Lbs				

NOTE: SUGGESTED Pitch & Lead shown below is for For SINGLE Lead. Multiply accordingly for DOUBLE & TRIPLE Lead

Suggested Stem Dia.: CL 150 = 1-3/4 In., CL 300 = 1-7/8 In., CL 600 = 2-1/4 In.

Suggested Pitch & Lead: CL 150, 300, & 600 = 1/4-1/2

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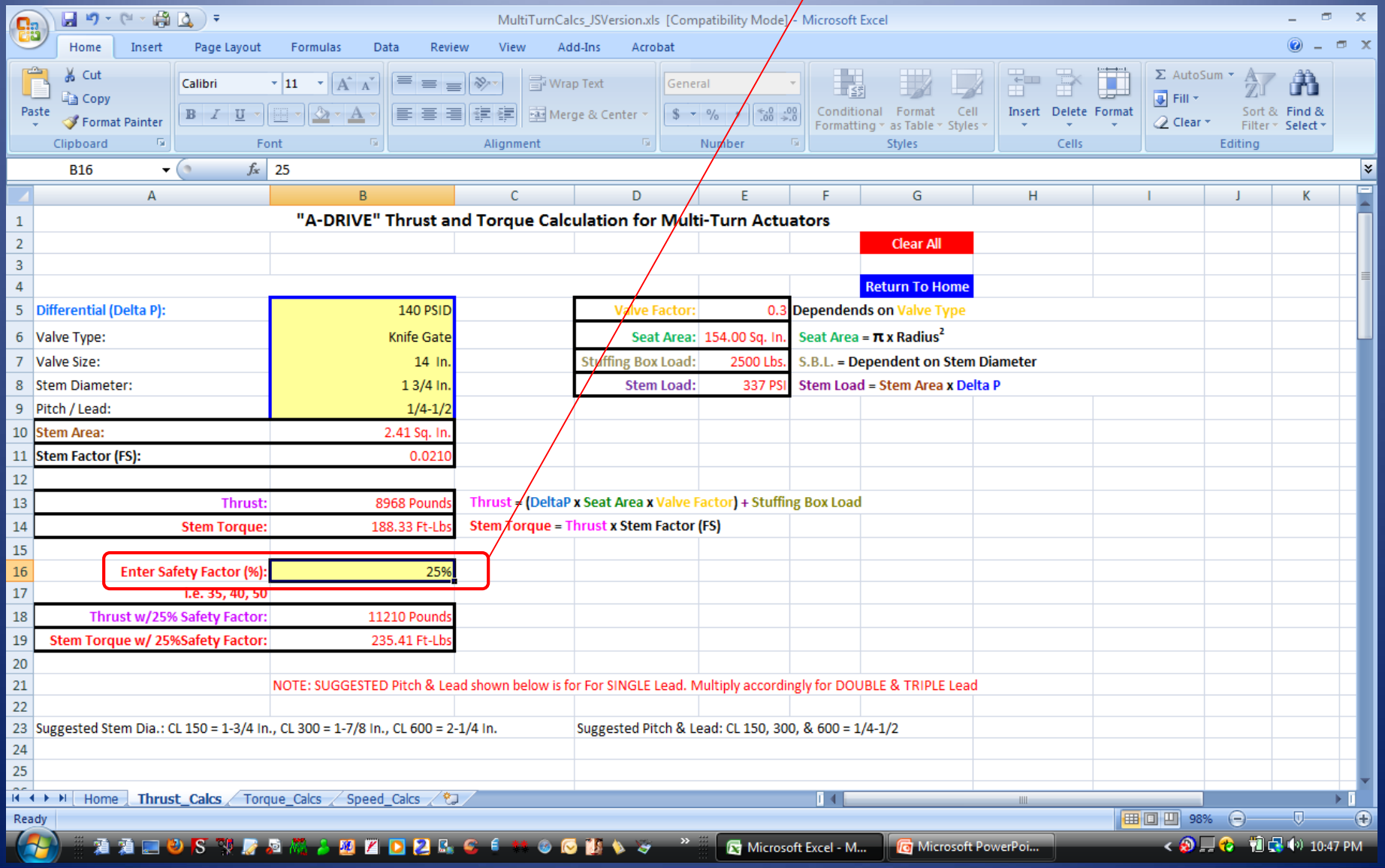
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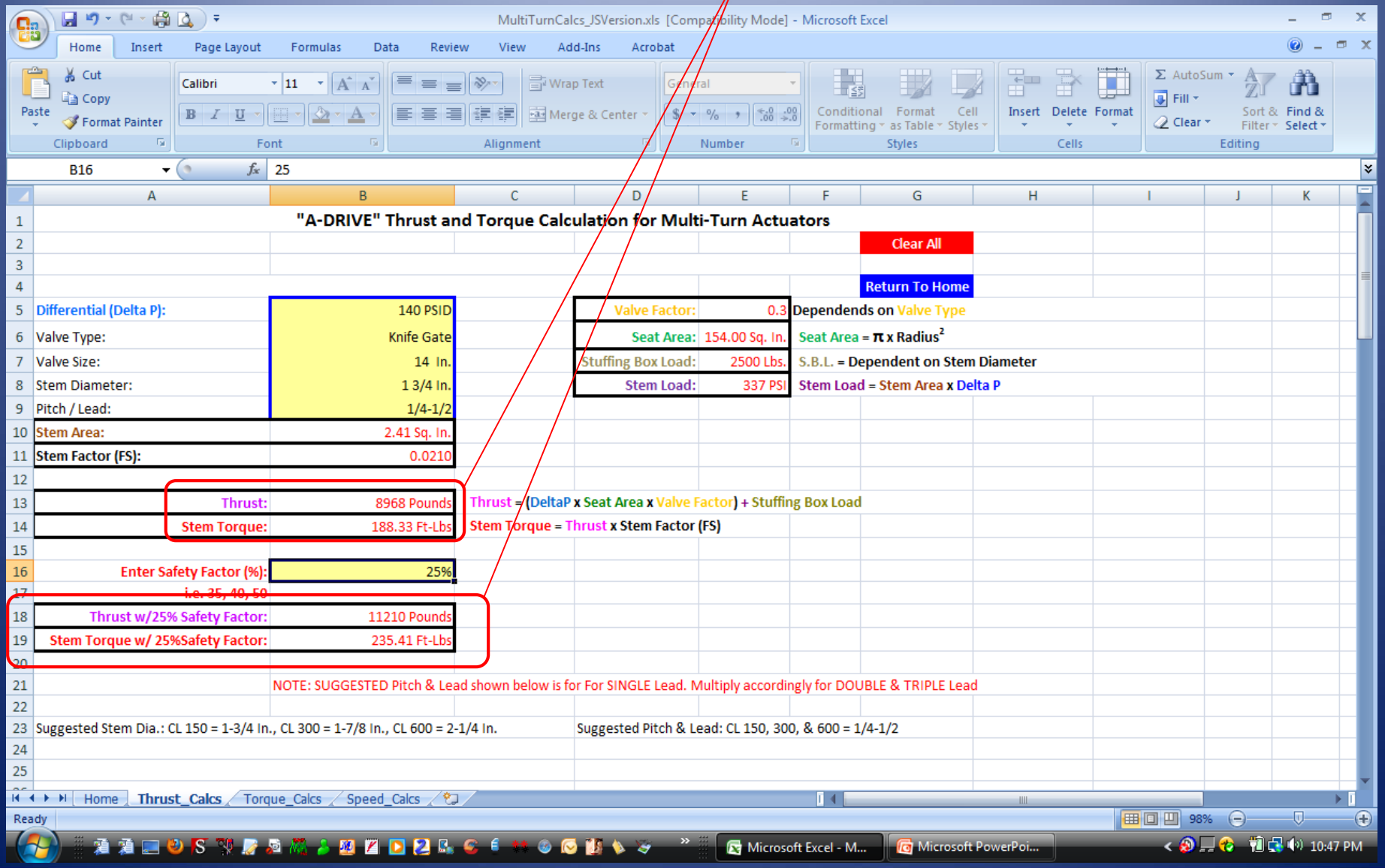
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Still unsure of your numbers?

(Then throw in a safety factor!)



Original Results and "Safety-Factored" Results both are shown!



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"A-DRIVE" Thrust and Torque Calculation for Multi-Turn Actuators

Clear All

Return To Home

Differential (Delta P):	140 PSID	Valve Factor:	0.3	Dependends on Valve Type
Valve Type:	Knife Gate	Seat Area:	154.00 Sq. In.	Seat Area = π x Radius²
Valve Size:	14 In.	Stuffing Box Load:	2500 Lbs.	S.B.L. = Dependent on Stem Diameter
Stem Diameter:	1 3/4 In.	Stem Load:	337 PSI	Stem Load = Stem Area x Delta P
Pitch / Lead:	1/4-1/2			
Stem Area:	2.41 Sq. In.			
Stem Factor (FS):	0.0210			
Thrust:	8968 Pounds	Thrust = (DeltaP x Seat Area x Valve Factor) + Stuffing Box Load		
Stem Torque:	188.33 Ft-Lbs	Stem Torque = Thrust x Stem Factor (FS)		
Enter Safety Factor (%):	25%			
i.e. 35, 40, 50				
Thrust w/25% Safety Factor:	11210 Pounds			
Stem Torque w/ 25%Safety Factor:	235.41 Ft-Lbs			

NOTE: SUGGESTED Pitch & Lead shown below is for For SINGLE Lead. Multiply accordingly for DOUBLE & TRIPLE Lead

Suggested Stem Dia.: CL 150 = 1-3/4 In., CL 300 = 1-7/8 In., CL 600 = 2-1/4 In.

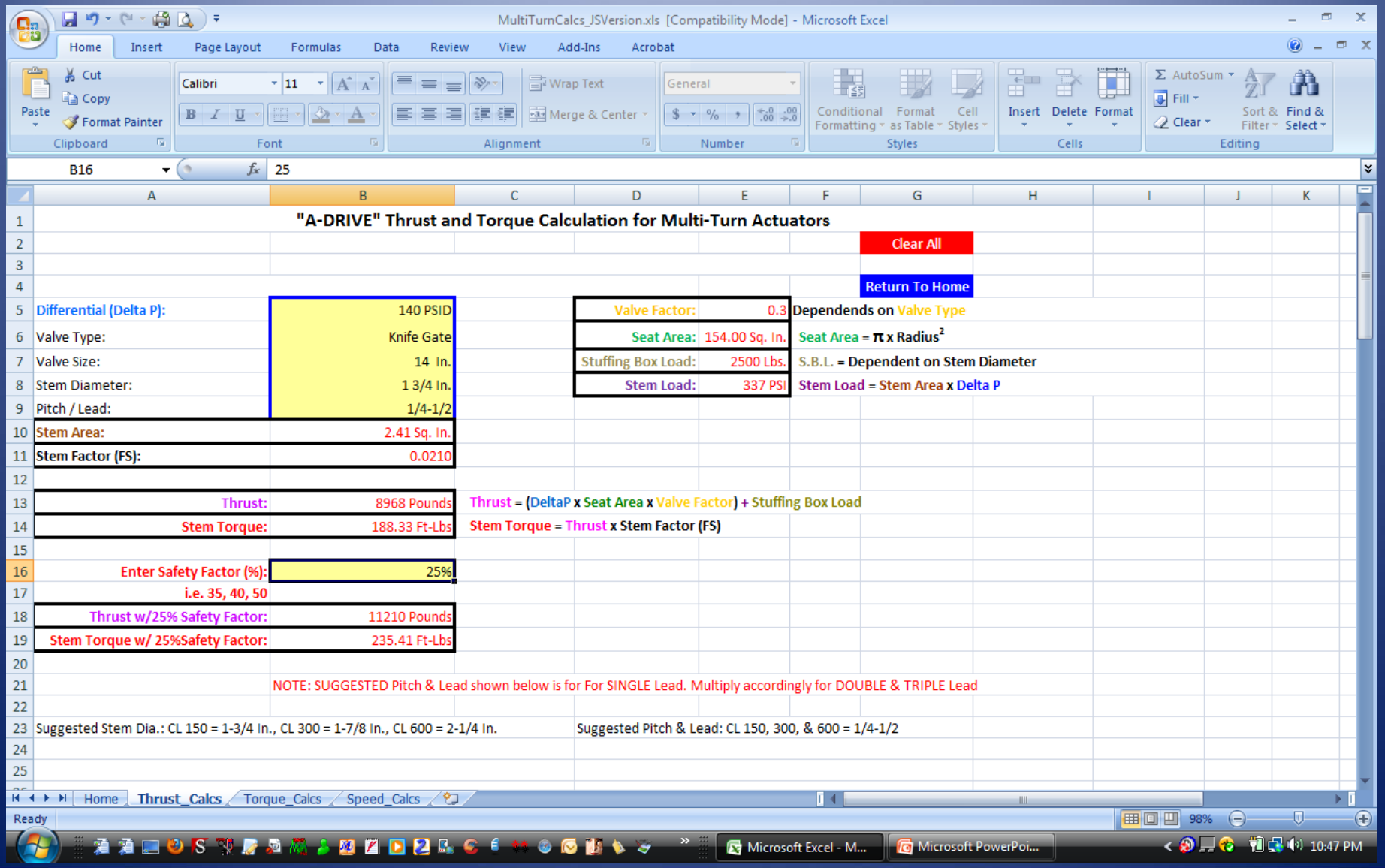
Suggested Pitch & Lead: CL 150, 300, & 600 = 1/4-1/2

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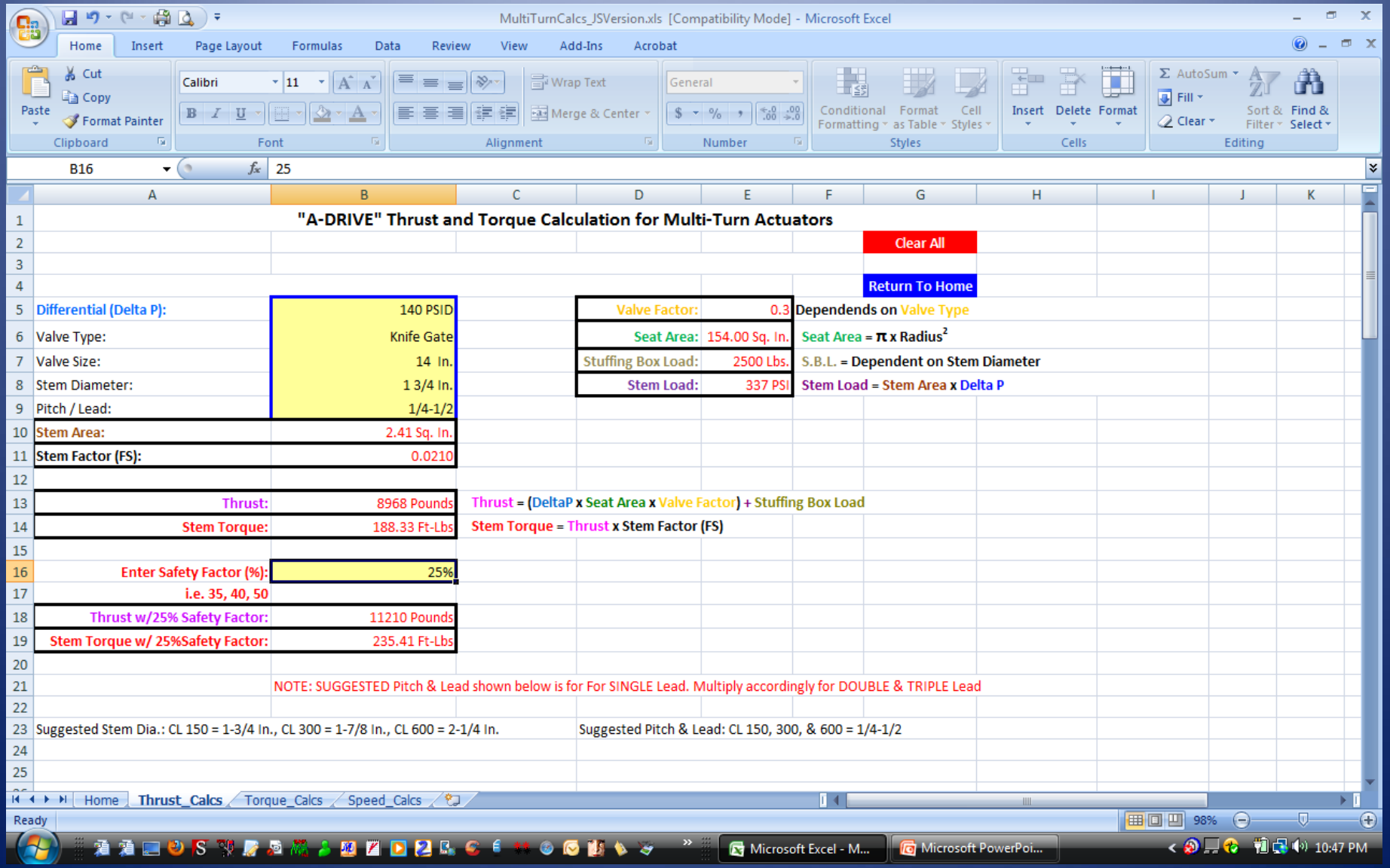
Ready

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No more REDUNDANT 10-Key calculator punching!



Complexity Simplified!



Thank You!

Jay Schwausch