
Analysis of mast tip movement with shroud extension

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a = 32 ;    (* mast step to chainplate horizontally, inches *)
b = 13.33 * 12 ; (* mast step to height of attachment of shroud *)
c1 = Sqrt[a^2 + b^2] ; (* length of shroud *)
lmast = 27 * 12 (* length of mast *)

g1 = ArcCos[(a^2 + b^2 - c1^2) / (2 * a * b)] ; (* angle of mast to deck *)

c2 = c1 + 1.901 ; (* length of shroud with insert added *)

g2 = ArcCos[(a^2 + b^2 - c2^2) / (2 * a * b)] ;
(* angle of mast to deck with insert in shroud *)

(g2 - g1) / Degree
3.49356

x = Sin[g2 - g1] * lmast (* movement of top of mast with insert in shroud *)
19.7434

c3 = c1 + 2.42 ; (*length of shroud with insert for toggle added *)
g3 = ArcCos[(a^2 + b^2 - c3^2) / (2 * a * b)] ;
Sin[g3 - g1] * lmast
25.1733

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Movement of mast from extension of upper shroud.

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g4 = ArcSin[1.901 / a] ;
g4 / Degree
Sin[g4] * lmast
3.40573
19.2476

g5 = ArcSin[2.42 / a] ;
g5 / Degree
Sin[g5] * lmast
4.33713
24.5025

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