

ESDU Controls 04.01.08

CONTROL HINGE-MOMENT COEFFICIENT DERIVATIVE DUE TO TAB

1. NOTATION AND UNITS (see Sketch 1.1)

		SI	British
b'_3	rate of change of control hinge-moment coefficient with tab deflection angle, $\partial C_H / \partial \delta'_{tab}$	rad ⁻¹	rad ⁻¹
C_H	control hinge-moment coefficient, $H / (\frac{1}{2} \rho V^2 S_f \bar{c}_f)$		
$(c)_{tab}$	wing chord at mid-span of tab hinge line	m	ft
$(c_b)_{tab}$	control chord forward of hinge line at mid-span of tab	m	ft
$\bar{c}_f$	mean chord of control surface aft of hinge line	m	ft
$(c_f)_{tab}$	chord of control surface aft of hinge line at mid-span of tab hinge line	m	ft
c_{tab}	chord of tab aft of its hinge line at mid-span of tab hinge line	m	ft
F	factor for trailing-edge angle		
G	factor defined by Equation (2.1)		
H	control hinge-moment	N m	lbf ft
M	free-stream Mach number		
S_f	area of control surface aft of hinge line	m ²	ft ²
s_f	span of control surface	m	ft
s_{tab}	span of tab	m	ft
V	free-stream velocity	m/s	ft/s
β	Prandtl-Glauert compressibility factor, $(1 - M^2)^{1/2}$		
δ'_{tab}	tab deflection angle relative to control surface measured about tab hinge line	rad	rad
Λ_h	sweepback of control hinge line	deg	deg
$\Lambda_{h tab}$	sweepback of tab hinge line	deg	deg
$\Lambda_{1/4}$	sweepback of wing quarter-chord line	deg	deg

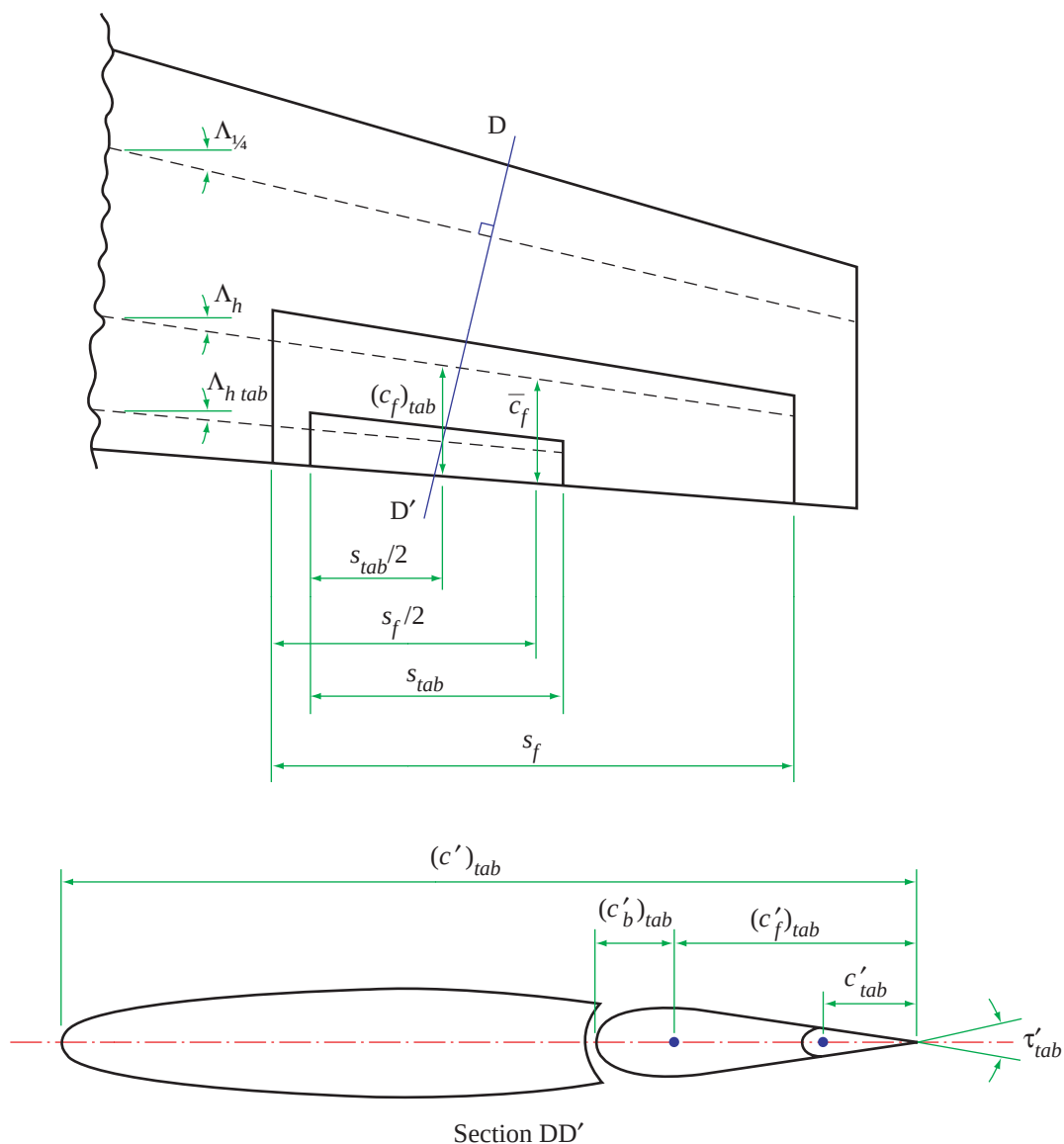
Issued July 1948
With Amendments A and B, August 1989 – 6 pages

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ρ	density of air	kg/m ³	slug/ft ³
τ_{tab}	trailing-edge angle of tab at mid-span of tab hinge line	deg	deg

Superscript

' as in c' or τ' denotes quantities measured in plane normal to wing quarter-chord line and in δ'_{tab} an angle measured about tab hinge line



Sketch 1.1