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Subsonic pressure drag of conical boat-tails

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Mr R.W. Gilbey — Senior Engineer.

SUBSONIC PRESSURE DRAG OF CONICAL BOAT-TAILS

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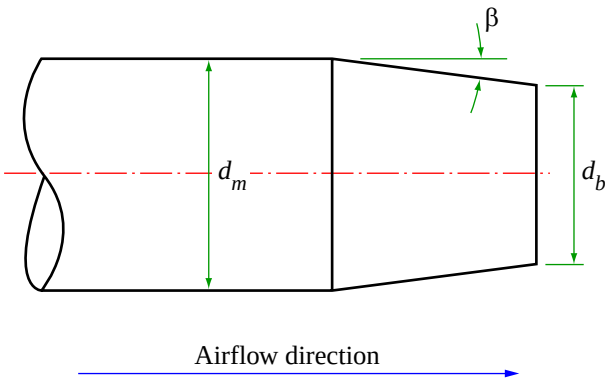
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SUBSONIC PRESSURE DRAG OF CONICAL BOAT-TAILS

1. NOTATION (see Sketch 1.1)

		SI	British
C_{Db}	base pressure-drag coefficient based on maximum cross-sectional area of body		
$C_{D\beta}$	boat-tail pressure-drag coefficient based on maximum cross-sectional area of body		
d_b	diameter of base	m	ft
d_m	maximum diameter of body	m	ft
M	free-stream Mach number		
R	Reynolds number based on body length		
β	boat-tail angle	degree	degree
θ	boundary-layer momentum thickness at start of boat-tail	m	ft



Sketch 1.1

2. INTRODUCTION

This Item provides a means of estimating the boat-tail pressure-drag coefficient of conical boat-tails for Mach numbers up to 0.8. The boat-tails are part of axisymmetric bodies and are immediately preceded by long, cylindrical mid-bodies. The bodies are at zero incidence and have turbulent boundary layers. The method is purely empirical and is based on a method developed at the British Aircraft Corporation (Guided Weapons) Ltd, Filton. It treats only cases where there is no jet flow through the boat-tail base. The data used in deriving the method were obtained from wind-tunnel investigations reported in Derivations 1 to 8.

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