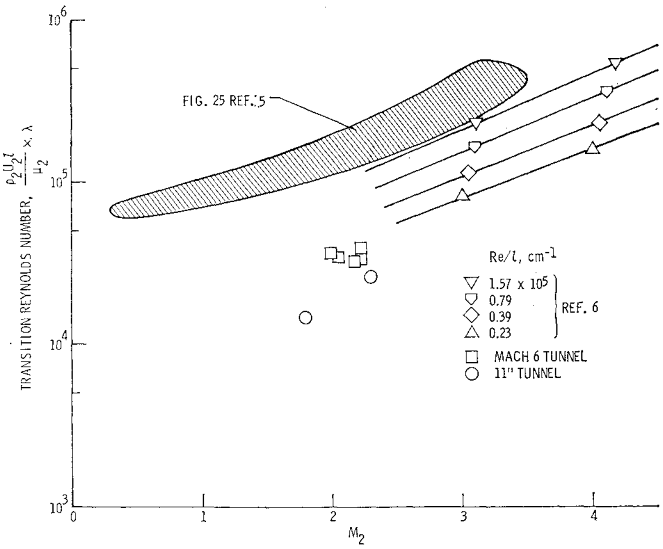

Fig. 2 Variation of transition Reynolds number with Mach number.

Note that Eq. (2) ignores the dependence of Re_T on M_3. This is probably justified when u_3 is subsonic, but it cannot be expected to hold when the velocity on both sides of the shear layer is supersonic.

The transition Reynolds numbers for the present study are plotted in Fig. 2 as a function of Mach number on the high velocity side of the shear layer, and compared with experimental values obtained for both two-dimensional[5] and axisymmetric[6] separated shear layers. Even though the variation with Mach number is roughly the same in all three cases, a direct comparison of the absolute values of Re_{T_o} is not justified, since the Reynolds numbers in Ref. 5 are based on conditions ahead of the separation shock rather than on local values, and the shear-layer studies in Ref. 6 are for separated axisymmetric rather than planar boundary layers.

From the limited results on transition in separated boundary layers, Edney concluded that the correlation of transition Reynolds number with Mach number, given by Chapman et al.,[5] was valid for shear layers produced by Type III interactions. Results presented here do not justify this conclusion and show that predictions of length to transition based on this correlation can be in error by as much as a factor of 5. This is ascribed to the small initial shear-layer thickness (presumably of the same order of magnitude as the shock thickness).

For one case ($M_2 = 1.79$) where Re_{T_o} is measured over a unit Reynolds number range of $1.16 \times 10^4 \text{cm}^{-1}$ to 5.83×10^6 cm^{-1}, there appeared to be no measureable change in Re_{T_o}.

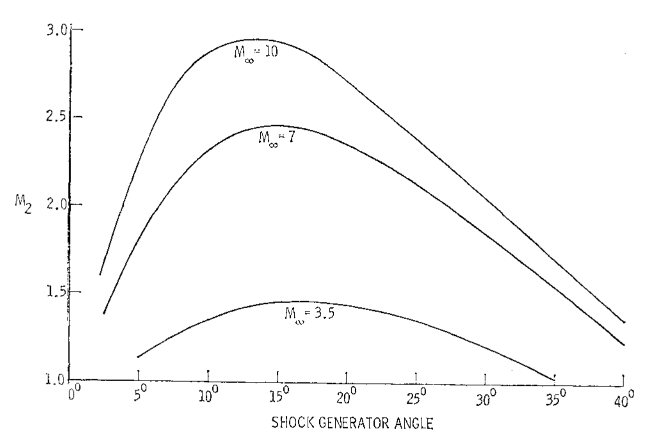

Fig. 3 Variation of M_2 with shock-generator angle for a range of freestream Mach numbers.

In contrast, Fischer[7] reported a strong unit Reynolds number effect in the same tunnel for transition in a boundary layer. This suggests that the differences between the measured values of Re_{T_o} in the 11-in. tunnel and the Mach 6 tunnel may be due to differences in model geometry rather than a unit Reynolds number effect. However, the available results are too meager to justify definite conclusions.

Although the data presented here cover a fairly limited range of Mach numbers, the results apply to a wider range of conditions than is at first apparent. The variation of M_2 with generator-shock angle, for a range of freestream Mach numbers, is given in Fig. 3. It can be seen that M_2 has a maximum value of only 2.9 for freestream Mach numbers up to Mach 10; thus, with a little extrapolation, the present results can be used to predict Re_{T_o} over most of this range.

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Errata

Erratum: "A Combustion Stability Analysis for Catalytic Monopropellant Thrusters"

W. L. OWENS JR.
Lockheed Missiles & Space Company, Sunnyvale, Calif.

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IN Fig. 4 of the above paper, the terms for the abscissa and ordinate are reversed. The abscissa should read $\bar{P}_c/\overline{\Delta P}_B$, and the ordinate $\bar{P}_c/\overline{\Delta P}_L$.

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