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GENERAL SAFETY

Hand Motion During Trip and Fall Scenarios

by Ralph L. Barnett¹ and Suzanne A. Glowiak²

ABSTRACT

Can the hands elevate during a tripping scenario? The location of workplace hazards, the design of fall intervention systems, the development of walking strategies, and the analysis of tripping accidents all require an understanding of hand motion under the combined effects of gravity and human response. This paper calculates the maximum simple reaction time and characterizes hand trajectory during a tripping event. The trajectories for the tripping scenario illustrated in Fig. 1 are shown in Fig. 2.

Human reaction does not appear to be fast enough to save you in most tripping situations. This is especially true the faster the initial walking speed and the higher the pre-trip elevation of the hands. Fall intervention strategies should therefore move in the direction of slower walking speeds and railings and grab bars lower than initial hand elevations.

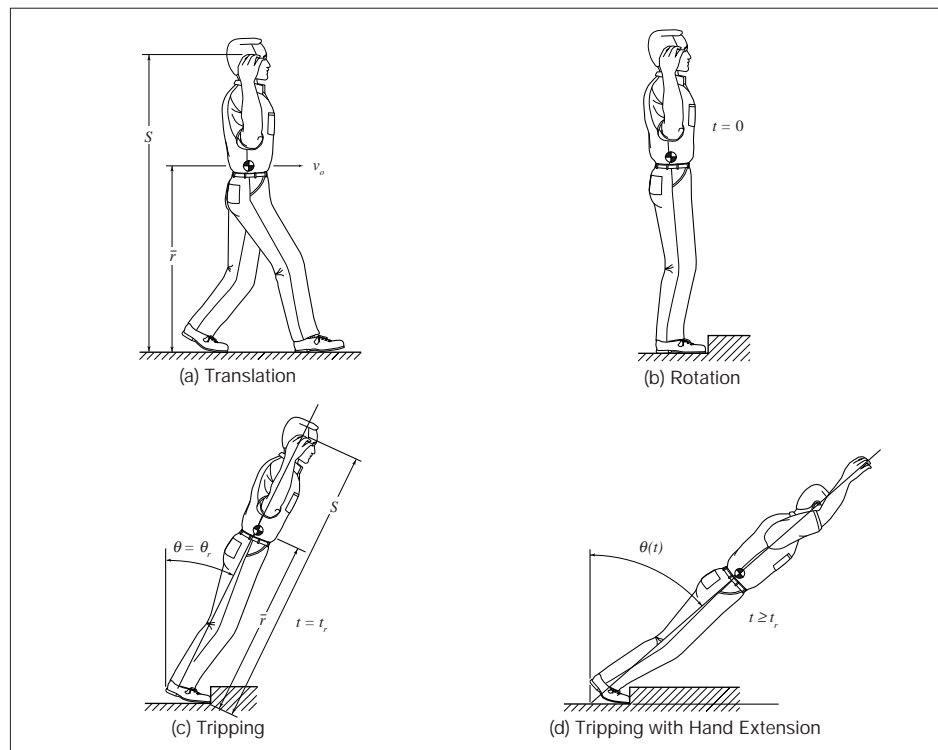


Figure 1 Tripping Scenario

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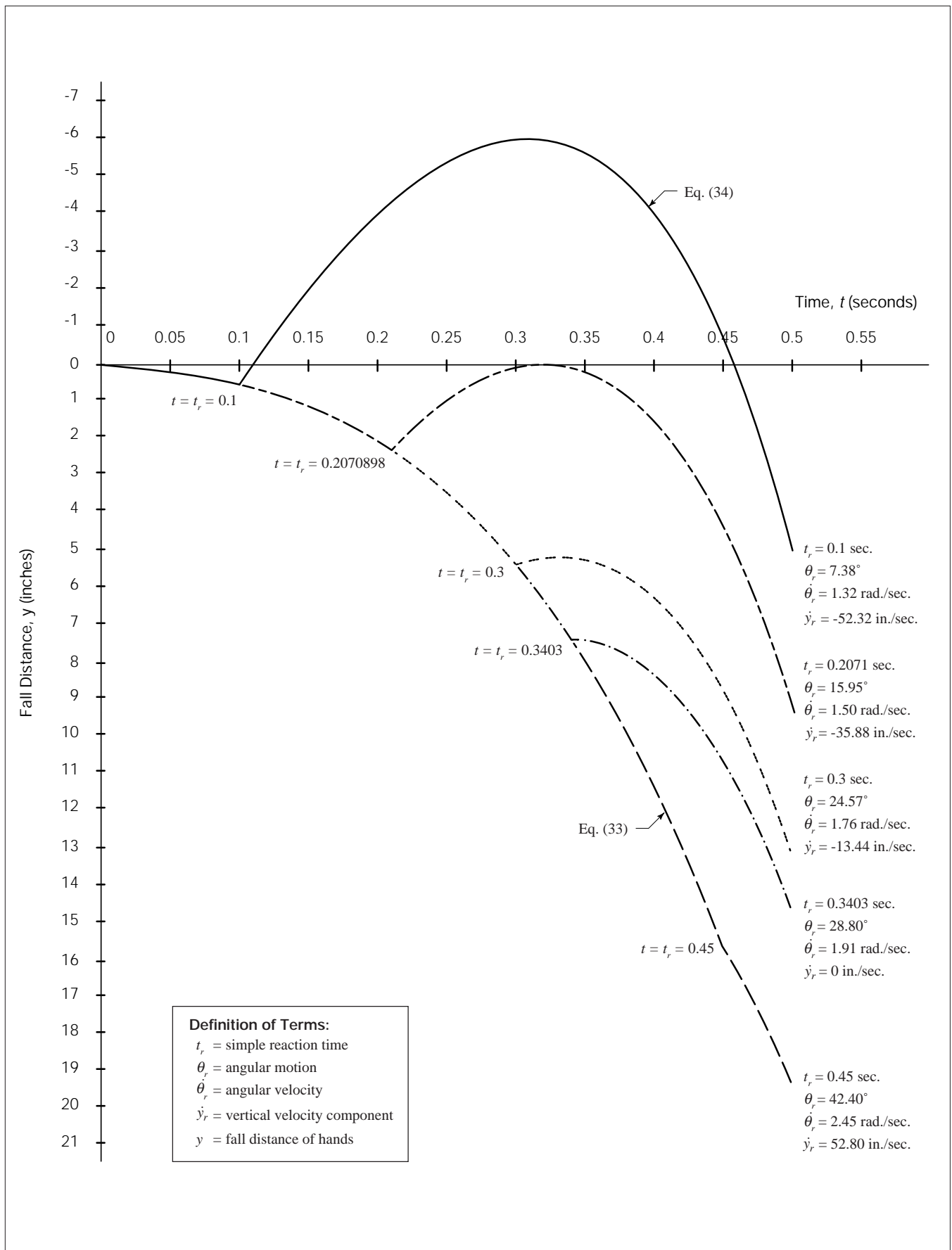


Fig. 2 - Hand Trajectories Under Tripping Conditions