

AIRPLANE “TIP OVER”©

by Dan Pemble, McDonnell Douglas/Boeing Field Rep. (retired September, 2009) – July 15, 2015

“Tip over” of some airplanes can and does in fact occur from time to time due to unplanned/unanticipated shifts in the airplane’s center of gravity. Such tip overs have occurred while airplanes were in maintenance status as well as during in-service operations. Please see the following photos of tip over events; these photos remind me of a couple related matters: (1) A “Tip Over Computer” was developed by Douglas Aircraft for most all Douglas-built airplanes and was supplied at no cost to operators. These computers were cleverly-designed “circular slide rules” used to calculate the CG and show the range where tip overs could potentially occur. Basically, for an airplane to remain in a stable condition, its center of gravity must never be allowed to go aft far enough to get close to the main landing gear centerline or the wing jacking point, whichever applies. (2) PSA, the first American operator of the MD-80, actually had “ballast trays” to accommodate lead weights installed in the nose wheel well in their initially-delivered airplanes. PSA operated many frequent & short-duration MD-80 flights up and down the coast of California. These flights were very popular with business travelers. PSA believed that many business travelers would prefer to occupy the aft cabin seats so that after arrival at the gate they could rapidly exit the aircraft via the aft ventral stairs. As such, PSA felt the CG could shift too far aft to the point of a possible tip over. However, the ballast trays were never utilized and no tip overs occurred on PSA MD-80’s during 1980-1987 while I was with them as their McDonnell Douglas Field Service Representative.

