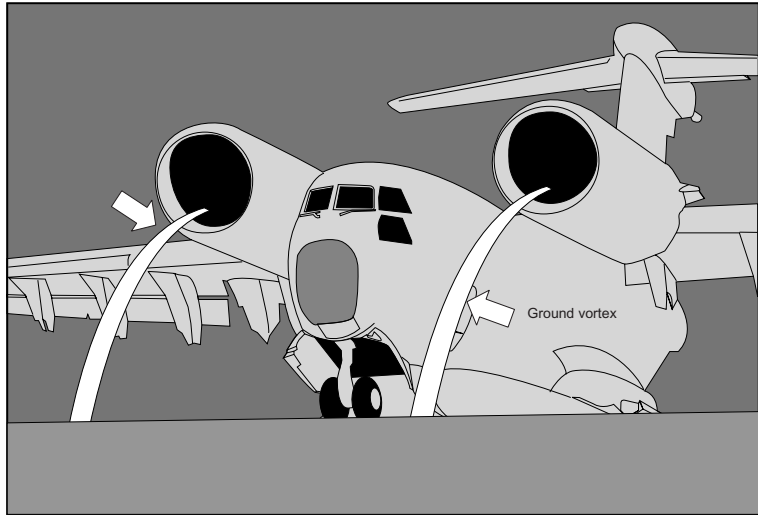


External Factors

Foreign Object Damage: Intake

Ingestion of foreign objects due to a vortex (rotating underpressure)



III. 5.2.1.2-5

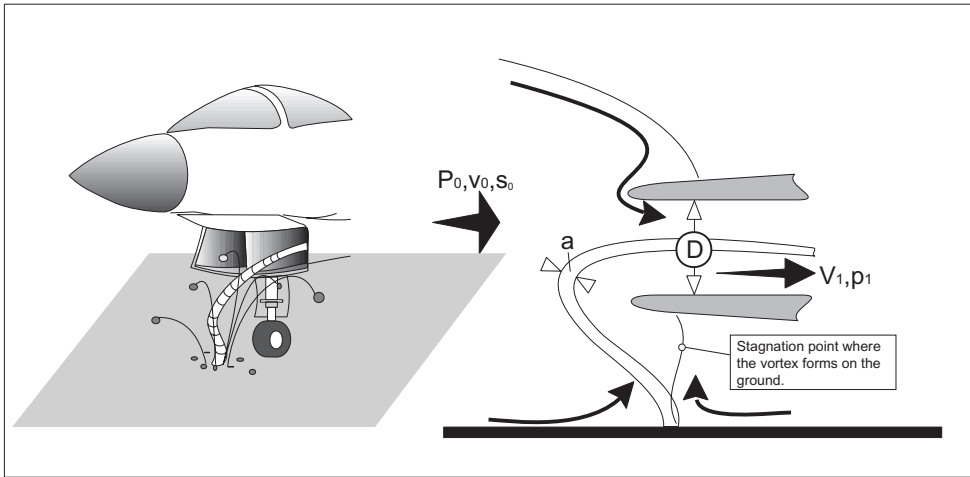


Illustration 5.2.1.2-5: The top diagram depicts obvious vortices formed by a military (testing) STOL cargo aircraft (Ref. 5.2.1.2-7). It is surprising that the engines, which are located high on the wing, can create underpressure tubes that reach all the way to the ground and increase the risk of FOD. This is especially disconcerting in the depicted case, since this aircraft is designed for especially short runways, which are not usually as debris-free

as longer standard runways.

The lower diagram shows the parameters that influence vortex formation as explained in Refs. 5.2.1.2-6 and 5.2.1.2-12. The values indicated by "0" are for the surrounding wind conditions, those marked "1" refer to the flow conditions in the inlet. The mass of the foreign object that could potentially be sucked in is proportional to the cube of the vortex diameter "a".