Image: Dream Chaser buffet wind tunnel model

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Credit: NASA EDGE/Ron Beard

(Phys.org) -- The Dream Chaser model with its Atlas V launch vehicle is undergoing final preparations at the Aerospace Composite Model Development Section's workshop for buffet tests at the Transonic Dynamics Tunnel at NASA Langley. The scale model is being tested as part of NASA's Commercial Crew Development program to regain the

American capability to launch astronauts safely to the International Space Station. The lifting body reusable spacecraft would carry as many as seven astronauts to the space station. Sierra Nevada Space Systems is developing the craft under a Space Act Agreement with NASA.

With the help of hundreds of pressure transducers, engineers from Sierra Nevada Corporation, the United Launch Alliance and NASA Langley will look at the pressure fluctuations the model and launch vehicle stack experience during the critical ascent to orbit, especially at transonic speeds. Shock-waves form on launch vehicles as they approach the speed of sound and may result in regions of highly unsteady flow.

Within these regions of the Dream Chaser and launch vehicle, the resulting buffet forces and high frequency acoustic noise must be clearly understood as part of the vehicle design process. Transonic wind-tunnel testing of large, highly instrumented scale models is the only method of determining the buffet environments of launch vehicles with complex shapes.

Provided by JPL/NASA